

Poster Presentation Abstracts – Day One

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 13-20

I001/AH

Outdoor Experiential Learning (OEL) in Healthcare for Team Development (TD) Programmes

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Aim: A study to determine the effectiveness of OEL over classroom methodologies for TD programmes for Nursing Officers (NO) was conducted in Tan Tock Seng Hospital.

Methods: Two groups (20 participants each) were exposed to OEL methodology involving low element activities as well as tunneling, which requires a high level of trust and support among team members and classroom based methodologies respectively. Both groups were subjected to the Team Development Inventory (TDI), a self-perception instrument, interjected prior to the programme and compared with 1 month after the programme. ANOVA of the difference in mean scores of both groups in each of the 10 parameters in the TDI was conducted. The key parameters were determined to be “Understand and Commitment to Goals” (UCG) and High Standards for Own Team’s Performance (STP).

Results: UCG revealed a t-test of 0.0001 and STP reveals a t-score of 0.0024. A statistically significant finding in both these key parameters indicates that the OEL methodology was superior in the context of Team Development Programmes. The “Law of Proximity” as defined by Wetheimer, supports this finding, in that through the use of appropriate metaphors and isomorphs, OEL programmes are able to create proximities between the activity, in this case tunneling, with actual applications in the workplace. Classroom methodologies tend to be theoretical and sometimes abstract.

Conclusion: OEL is a superior training methodology than classroom interventions in healthcare for Team Development Programmes, when used in conjunction with appropriate and relevant metaphors and isomorphs.

I002/AH

Prescription Drug (Benzodiazepine) Abuse/Dependence: Pattern of Use, Attitudes, Perception and Profile of CAMP Patients

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Aim: Recently, benzodiazepine (BZD) prescriptions in Singapore are arising (Kua & Tan, 1999). Doctors’ prescribing practice and doctor-shopping behaviour were found to contribute to BZD abuse (Boixet, Battle & Bolibar, 1996). This study aims to: 1) Examine the profile of CAMP patients with BZD abuse/dependence, 2) Investigate the relationship between the severity of BZD dependence and 2 key variables: doctor-shopping behaviour and patients’ perception on doctor’s knowledge, attitudes and practice.

Methods: Semi-structured clinical interview and medical records. Measurement: Bendep-SRQ, UT and BAL.

Results: The majority of an initial sample of 50 BZD dependent patients are married (40%), Chinese (90%), males (58%) in their late 30s. Half of them are currently unemployed. Two-thirds of them have used illicit drugs. BZDs were primarily obtained from local general practitioners (GPs) (74%). Most patients believe that doctors have insufficient knowledge (72%), low interest (72%) and poor practice (62%) in treating their BZD addiction. Patients’ perception of doctors’ attitudes and knowledge of BZD addiction were found to correlate positively with their severity of BZD problematic use ($P = 0.005$ and $P = 0.008$ respectively).

Conclusion: BZD abuse in Singapore is contributed to by both doctor-shopping behaviour and doctors’ prescribing practice. Doctors need training on the assessment and management of BZD dependence. Centralised control such as a national BZD registry may prevent doctor-shopping behaviour. Alternative coping strategies by early intervention programme and public education will be cost-effective. Future research will investigate knowledge, attitudes and practice among GPs.

I003/AH

Comparing the Spinal Block Profiles of Low Dose Racemic and Levo-Bupivacaine

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Aim: This pilot study was performed to compare the subarachnoid administration of low dose levobupivacaine and racemic bupivacaine in patients undergoing minor gynaecological procedures.

Methods: In this prospective, double-blind trial, 18 patients were randomised to receive either 5 mg hyperbaric levobupivacaine + 25 mcg fentanyl in 2.5 ml normal saline (Group LB) or 5 mg hyperbaric racemic bupivacaine + 25 mcg fentanyl in 2.5 ml normal saline (Group RB). Sensory block (loss of pinprick sensation), motor block (modified Bromage scale), analgesic characteristics and post-block complications were evaluated. Statistical analysis comprised the Student’s t-test and the Wilcoxon ranked sum test.

Results: Patient characteristics in the 2 groups were not statistically different. Sensory levels in both groups were adequate for surgery. Six (75%) patients in the LB group did not experience any motor block while the remaining 2 patients (25%) had full recovery of muscle strength (Bromage scale 0) within 30 minutes. In contrast, 8 (80%) patients in the RB group had a Bromage score of 2 or more. Only 2 (20%) patients in the RB group were able to perform a straight leg raise 60 minutes after intrathecal drug administration. Group LB also reported greater patient satisfaction scores that was significant. There was no difference in adverse effects between the 2 groups.

Conclusion: The intrathecal use of 5mg levobupivacaine with 25µg fentanyl achieved adequate anaesthesia for minor gynaecological procedures with less motor block and better patient satisfaction. It may be used to shorten recovery room stay and reduce costs.

I004/AH

Understanding the Basic Elements of Informed Consent: A Survey of Medical Professionals

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Aim: Informed consent is of paramount importance to the medical profession because of ethical and medico-legal issues. Our aim is to investigate the perceptions and practices of medical professionals in matters related to informed consent.

Methods: We used a questionnaire comprising 34 questions to survey 100 medical professionals over a 1-year study period on the 8 basic elements of informed consent. This includes methodology, risks, benefits, alternatives to treatment, confidentiality of data, compensation, contact information and voluntary participation.

Results: Our results showed that 17.4% of those surveyed fail to ensure patients fully understand the methodology of the trial, and 17.3% do not disclose the risks completely. 16.1% do not explain the benefits of the proposed treatment, with 17% not discussing the alternatives available. 29.8% fared poorly in assuring patients of confidentiality of records, while 17.1% fail to convey the idea that participation in the trial is voluntary. The worst performing areas were in the elements of compensation and contact information, where 51.9% do not inform patients that compensation is available in the event of a trial-related injury, while 51.3% do not provide patients with contact information for the trial.

Conclusion: In general, we find that there is a significant proportion of medical professionals with inadequate understanding of the basic elements of informed consent. There is therefore a strong need to train our doctors and research nurses in the proper way of taking informed consent.

I005/AH

Appearance of Multi-Drug Resistant Strains Among the Endemic Nosocomial Bacterial Flora at National University Hospital, Singapore

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Aim: The objective of this study was to analyse the type of Gram-negative bacteria causing nosocomial infections and their trend of resistance during the past 10 years (1994-2003). The antibiotic susceptibility pattern was compared with antibiotic use in the hospital.

Methods: The most common Gram-negative bacteria causing hospital

infections are *Escherichia coli*, *Klebsiella* spp., *Proteus* spp., *Acinetobacter* spp. and *Pseudomonas aeruginosa*. The pathogens detected from clinical samples were identified by the Vitek-I automated system using GNI card, Microbact and API 20E Systems. Susceptibility testing was done by the Vitek-I system and Kirby-Bauer method. NCCLS criteria were adopted for interpretation of results. The results are saved in computer records.

Results: The effectiveness of major groups of antimicrobial agents; penicillins, cephalosporins, aminoglycosides, fluoroquinolones and penems has been decreasing steadily. The number of DDDs per 1000 patient days of the antibiotics studied has shown an increasing trend over the years. The major contributors to this increase are ciprofloxacin tablets and ceftriaxone injections. The incidence of ESBL producers among *Escherichia coli* (27%) and *Klebsiella* spp. (55%) too show an increasing trend.

Conclusion: The "best guess" empirical treatment is becoming increasingly difficult for clinicians. Introduction of techniques for the rapid detection of pathogens and their susceptibility patterns is becoming increasingly important. Recommendations on rational antibiotic therapy, rather than being generalised, should be based on evidence and local epidemiological factors. Antibiotic policies should be re-emphasised and updated according to the changing susceptibility pattern of bacteria.

I006/AH

Technical Evaluation of D Dual Kit on HbA1c and HbA2

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Aim: The Bio-Rad D-10 system is a point of care (POCT) high performance liquid chromatography (HPLC) instrument targeted at small and medium-sized laboratories. Features incorporated into the instrument include barcoding, interfacing, small footprint and primary tube sampling. The Bio-Rad D-10 Dual Kit is intended for the per cent determination of haemoglobins A2, F, A1c and abnormal haemoglobins.

Methods: We examined and compared the performance of the dual kit to our current Variant Classic method for HbA2 and Variant II for HbA1c.

Results: Using samples from our patients, the correlation obtained: HbA1c: D-10 = 1.13 (Variant II) - 0.95, $r = 0.99$, $n = 109$. The bias plot shows D-10 values to be >0.5 -1.4% HbA1c values $>10\%$. HbA2: D-10 = 1.01 (Variant Classic) + 0.21, $r = 0.99$, $n = 83$. The bias plot shows D-10 values to be >1.4 -6% at HbA2 values $>20\%$. HbE variants: D-10 = 1.27 (Variant Classic) - 4.18, $r = 0.77$, $n = 18$. Precision was evaluated using 2 levels of controls. Within day imprecision for HbA1c range of 4.9-11.3% ($n = 5$) obtained a coefficient of variation (CV) of $\leq 1\%$, between-day imprecision ($n = 8$) $\leq 2\%$ and total imprecision $\leq 2\%$ ($n = 12$). Within day imprecision for HbA2 range of 2.2-6.4% ($n = 5$) obtained a coefficient of variation (CV) of $\leq 2\%$, between-day imprecision ($n = 7$) $\leq 5\%$ and total imprecision $\leq 5\%$ ($n = 11$).

Conclusion: Our laboratory finds this instrument performs well in terms of precision and accuracy using samples frequently encountered in our hospital population. It is convenient, rapid and easy to use.

I007/AH

Indicator System for Herpes Simplex Virus Culture in National University Hospital, Singapore

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Aim: Conventional Herpes simplex virus cell culture includes monolayer cell culture and immuno-staining. Detection of viral growth is by presence of cytopathic effect (CPE). This takes up to 14 days for full investigation and the process is labour intensive and CPE dependent. Shell vial technique to demonstrate viral antigen by immunofluorescence test is a breakthrough to improve the time for detection; however, multiple culture sets must be inoculated to capture the full spectrum of viral growth. This is very costly and labour intensive. The indicator system is an in-house developed procedure established in National University Hospital, Microbiology laboratory which includes microtitre well and shell vial cultures. This protocol aims to shorten positive reporting time, cut cost and reduced labour and workload.

Methods: 1) Microtitre plate culture - Cell line selection - Cell line split ratio - Cell line maintenance 2) Shell vial culture - Cell line preparation - Time

schedule for immunofluorescence confirmation 3) Indicator system reading criteria - Proposed workflow

Results: 95% of positive results reported within 7 days. Exit immunofluorescence test results at 14 days incubation.

Conclusion: This method saves time, labour, cost and shortens reporting time.

I008/AH

Will the Compliance to the Measured Carbohydrate Exchange Diet at First Visit Be Used to Assess the Changes of HbA1c in Diabetic Nephropathy Patients?

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Aim: To investigate whether the compliance level to carbohydrate exchange and low refined sugar diet at first visit can be used to assess HbA1c changes in diabetic nephropathy patients.

Methods: 122 ($n = 122$) diabetic nephropathy patients (53% males, mean age 61 ± 9.96 years) had diet history taken by renal dietitians at the first outpatient visit (dated September 2002 to March 2004). The compliance of the diet was stratified into 3 groups (compliance, partial compliance and non-compliance) based on the carbohydrate exchanges and frequency of refined sugar consumption without acknowledging baseline HbA1c level. HbA1c at the baseline and post intervention (within 6 months) were compared.

Results: Eighty patients (66%, $n = 122$) had reduction in HbA1c. The initial assessment of dietary compliance level was correlated with baseline HbA1c level ($P < 0.05$). The means of baseline HbA1c for the compliance ($n = 47$), partial compliance ($n = 43$) and non-compliance ($n = 32$) groups were 8.9 ± 1.6 , 9.3 ± 1.3 and 9.6 ± 1.9 per cent respectively ($P < 0.05$). The rates of HbA1c reduction in these groups were 0.035, 0.058, and 0.02, respectively ($P = NS$).

Conclusion: The stratification of dietary compliance level using the developed criteria at first visit correlated with baseline HbA1c. However, this did not affect the changes of HbA1c. Subsequent follow-up will be required to evaluate the correlation between dietary compliance and HbA1c level. More comprehensive criteria of dietary compliance will have to be developed and validated.

I009/AH

C-reactive Protein: How Low Can You Go?

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Aim: C-reactive protein (CRP) is an established marker of inflammation and has recently been identified as a marker of cardiovascular risk. Its use has been complicated by the need for 2 assays: one with a wide dynamic range for traditional use and another with high sensitivity (low limit of detection) for cardiovascular risk assessment. This study evaluates a new CRP method that combines both features into a single assay.

Methods: The CRPLX (Roche Diagnostics) assay was run on the Roche Modular P analyser. Imprecision was assessed using QC material and data for the precision profile collected from on-board dilutions of the lowest control. Linearity was assessed using serum samples following NCCLS EP6-A. Accuracy at high levels was assessed against the Roche Tinaquant CRP assay and at <5 mg/L against the Roche CRP (Latex) HS assay.

Results: Imprecision CVs at 24 and 48 mg/L were 4.6 and 6.4% respectively. Functional sensitivity (CV 10%) was 0.7 mg/L with assay linearity to 250 mg/L. Deming linear regression showed CRPLX = $1.07 * \text{Tinaquant} + 0.03$ ($n = 55$); mean bias 5.83 at high levels and CRPLX = $1.26 * \text{CRPHS} - 0.04$ ($n = 57$); mean bias 0.14 at CRP <5 mg/L

Conclusion: The new CRPLX assay shows good precision and accuracy with a wide dynamic range. It can be used for both high (traditional use) and low level (cardiovascular risk assessment) measurement. Its use will simplify laboratory processes while increasing the availability of CRP as a cardiovascular marker to clinicians and patients.

I010/AH**Ability of HIV Screens to Predict HIV Confirmation Results**R HAWKINS¹¹*Department of Pathology and Laboratory, Tan Tock Seng Hospital, Singapore*

Aim: Present policy requires reactive HIV screen results to be confirmed at the HIV Reference Laboratory. This study describes the delay in reporting of HIV confirmation samples and assesses the ability of the quantitative signal/cutoff (S/CO) data from the HIV screening test to predict the confirmation report.

Methods: Tan Tock Seng Hospital began using the Abbott HIV1/2 gO assay on the Abbott AxSYM for HIV screening in April 2001. All grey zone (S/CO 0.9-1.0) and reactive samples (S/CO >1.0) are sent for confirmatory testing. Anonymised details of samples from April 2001-2004 were entered into MS Access for statistical analysis, together with the final confirmation followup results for Indeterminate or Inconclusive confirmatory results.

Results: Three hundred and fifty-three samples were sent with a median turnaround time of 6 days (95% <10 days). The numbers of results returned as Negative, Indeterminate, Inconclusive and Positive for S/CO 0.9-3.8 were 26, 17, 1, 0 and for S/CO 6.7-80.0 were 0, 0, 9, 300 respectively. There were no samples with S/CO 3.9-6.6. When the results of follow-up of indeterminate and inconclusive cases are included, the numbers of final results returned as Negative, Positive and No followup for S/CO 0.9-3.8 were 36, 0, 8 and for S/CO 6.7-80.0 were 0, 305, 4 respectively.

Conclusion: The Abbott HIV1/2 gO AxSYM screening test S/CO ratio is an excellent predictor of the final confirmatory test result. This data should prove valuable for acute management decisions, such as needlestick injuries, while awaiting the results of confirmatory testing.

I011/AH**Genetic Characterisation of Renal Cell Carcinoma by Comparative Genomic Hybridisation CGH Initial Results with Three Cases**S ISHAK¹, SH LEONG², SY TAN¹, SJ CHIA³¹*Department of Pathology and Laboratory, Tan Tock Seng Hospital, Singapore, ²DMS, National Cancer Centre, Singapore, ³Department of Surgery, Tan Tock Seng Hospital, Singapore*

Aim: To study the genetic characterisation of renal cell carcinoma (RCC) by comparative genomic hybridisation (CGH).

Methods: Tumour DNA is labelled with FITC and normal DNA (derived from lymphocytes from a healthy volunteer) is labelled with Texas Red. Tumour and normal labelled DNA are allowed to hybridise to normal human metaphase preparations in a competitive fashion. The signals are detected and analysed using a computer fitted with an image analysis programme. The green to red fluorescence ratio measured along the chromosomal axis represents loss or gain of genetic material in the tumour at that specific locus.

Results: All 3 cases are sporadic RCC of clear cell type. Two cases showed deletions of 3p, in keeping with the known association with clear cell carcinoma of the kidney. In addition, 1 case showed -8, -10, -13q and -14q. Two other cases showed gains of 5q31qter, 8q24.1qter, 1q25q32 and 3q21. They also show losses of 10p11.2-13, 14q12, 17p13 and 4q12. Among the genes known to be associated with RCC at these loci include FHIT (3p14.2), DIRC2 (3q21), p53 (17p13) and TRC8/HRC1 (8q24.1). The only case showing loss of 17p13 (p53) is in a RCC of Fuhrman grade 3. The remaining 2 cases were graded as Fuhrman grade 1.

Conclusion: Whilst various translocations have been described in renal cell carcinomas, our initial findings suggest that copy number changes are present that may involve these same genes.

I012/AH**Accuracy Evaluation of Biorad D10 HbA1c Analyser**R HAWKINS¹¹*Department of Pathology and Laboratory Medicine, Tan Tock Seng Hospital, Singapore*

Aim: HbA1c measurement is the mainstay of diabetic monitoring and is available onsite at all National Healthcare Group (NHG) polyclinics. In 2003, all NHG polyclinics began use of the Biorad D10 HbA1c instrument. This study evaluates the accuracy of the D10 against the Roche Tinaquant

immunoassay system used in Tan Tock Seng Hospital Laboratory.

Methods: Over 5 days, 132 routine samples for HbA1c analysis (EDTA whole blood) were analysed using the Roche Tinaquant HbA1c assay (run on the Roche 917 analyser) and the Biorad D10 HbA1c analyser. The D10 is an automated HPLC system that delivers a HbA1c result in 3 minutes using 5 uL EDTA whole blood (dead space 1 mL).

Results: The bias plot showed a concentration dependent bias in D10 readings. The plot is an inverted U, with under-reading of ~0.5% at Roche HbA1c of 6% and 15%, equivalence at 7.5% and 13% and over-reading by up to ~1.0% at HbA1c of 10%. The imprecision of differences between the 2 methods increased above Roche HbA1c 9%. The mean bias (D10-Roche) was 0.18% (95% CI: 0.09-0.26) and the 95% limits of agreement were -0.80 to +1.15%. Clinical agreement between the 2 methods using MOH targets for ideal, optimal, suboptimal and unacceptable control was very good with a kappa coefficient of 0.95.

Conclusion: Despite obvious concentration dependent biases, the Biorad D10 showed good overall analytical and clinical agreement with the Roche Tinaquant assay. Nevertheless, clinicians should be aware that a difference of 0.5-1% between results from these 2 methods is not unusual.

I013/AH**Reducing Medication Errors in Nursing Homes Through Clinical Pharmacy Services**LL LOH¹, WM TENG²¹*Department of Pharmacy, National Healthcare Group Pharmacy, Singapore, ²Department of Pharmacy, Singapore*

Aim: Elderly residents in nursing homes often face adverse drug events that may be preventable. Pharmacists carry out drug interventions through regular visits to minimise the occurrence. The objective of this study is to identify and evaluate the incidence of medication errors in 3 local nursing homes currently engaging the pharmacy services provided by National Healthcare Group (NHG) Pharmacy. These services include medication chart reviews and audits, accurate and timely supply of medications, maintenance of ward stocks, provision of continuing education lectures and drug information.

Methods: Medication charts were reviewed for a period of 6 months for 279 residents in Homes A and B, and a period of 3 months for 303 residents in Home C. All interventions made by the pharmacists within a specific time frame were collated according to each nursing home and subsequently classified into 2 main types of medication errors (prescribing and administration errors). The results obtained were categorised and analysed.

Results: The most common administration and prescribing errors for each nursing home were different drugs kept in the same container (21%) and therapeutic duplication (3%) for Home A, medications not served but not discontinued (26%) and inappropriate duration (13%) for Home B, and medications not served but not discontinued (70%) and inappropriate duration (3%) for Home C respectively.

Conclusion: Medication errors are common in the 3 nursing homes. Through the provision of clinical pharmacy services, most of them are prevented. Therefore, pharmacists can have a significant impact in reducing medication errors by identifying and resolving them.

I014/AH**Parenting Behaviour and Sense of Competence in Parents with Attention Deficit Hyperactivity Disorder (ADHD) Children**C KEE¹, J LEONG¹, J TEO²¹*Department of Psychology, Institute of Mental Health/Woodbridge Hospital, Singapore, ²Department of Child and Adolescent Psychiatry, Institute of Mental Health/Woodbridge Hospital, Singapore*

Aim: Studies suggest that parents with ADHD children have lower parenting self-esteem and exhibit more negative, coercive, over-reactive and lax parenting compared to parents of symptom-free children. There is less research that compares the parenting behaviour and experiences of parents with ADHD children against parents of children with other psychiatric or psychological conditions apart from ADHD. In order to determine if parenting differences were specific to parents of ADHD children or were common to parents who have children suffering from any psychiatric or psychological condition, this study compared parents of ADHD children against a community

sample as well as a non-ADHD clinical sample.

Methods: Thirty parents with children diagnosed as having ADHD were compared against 25 parents with non-ADHD children seen at a child psychiatric clinic, and 51 parents of children from a neighbourhood primary school. Questionnaires measuring parenting behaviour and parental sense of competence were administered. Comparison of means was made across the groups on the parenting variables.

Results: Findings suggest that parents with ADHD children exhibited significantly higher levels of overreactive parenting and were significantly lower in their sense of parenting efficacy compared to the community group of parents. However, they were not significantly different from parents of non-ADHD children who had other psychiatric or psychological problems on these parenting measures.

Conclusion: This study suggests that the parenting problems of parents with ADHD children are not unique to ADHD but common to parents of children with any psychiatric or psychological condition.

I015/AH

The Effect of the Presence or Absence of Flexor Digitorum Superficialis (FDS) of the Little Finger on the Grip Strength

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Aim: The purpose of this study is to examine the effect of the presence (independent or common) or absence of Flexor Digitorum Superficialis (FDS) of the little finger on the grip strength in a large general population.

Methods: Subjects with existing hand pathology were excluded from the study. This study evaluated 402 subjects (804 hands), 145 males and 257 females. The population age range was between 7 and 85 years. Using a standard test for detecting the presence of FDS, out of 804 hands, 48 were found to FDS-absent, 306 FDS-common, and 450 FDS-independent. The Jamar Dynamometer was used to assess the grip strength.

Results: The average grip strength of those with FDS-independent was 31.69 kg. Those with FDS-common were 28.98 kg and those with FDS-absent were 28.49 kg. The results showed that those with FDS-independent had greater grip strength than those with FDS-common and FDS-absent, while FDS-common and FDS-absent groups had no significant difference in grip strength.

Conclusion: This study showed the effect of the presence of the FDS of the little finger on grip strength, it seems to reflect the importance of the FDS of the little finger in helping the individual achieve greater grip strength. It also showed the need to take into consideration the variable anatomy of the FDS of the little finger while evaluating population norm of the grip strength in Singapore population.

I016/AH

Irrational Beliefs and Job Stress Among Occupational Therapists in Singapore

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Aim: Studies over the years have looked into levels and sources of stress among occupational therapists. However, none has examined how beliefs systems affect job stress. This study attempted to investigate the relationship between intensity of irrational beliefs and stress levels. It also sought to examine associations between types of irrational beliefs and different sources of stress.

Methods: A cross-sectional survey was carried out between February and April 2003, during which self-reported questionnaires were posted or electronically mailed to occupational therapists working in various settings in Singapore. The 3 structured questionnaires were the Maslach Burnout Inventory, Sources of Stress in Occupational Therapy and Survey of Personal Beliefs. Thirty-seven occupational therapists responded.

Results: Results showed that intensity of irrational beliefs was unrelated to stress levels. However, certain types of irrational beliefs were related to the experience of certain sources of stress. In particular, low frustration tolerance was associated with stress regarding patient contact. Besides that, irrationality

in self worth was associated with stress pertaining to rewards and recognition as well as to professional value.

Conclusion: This study had shown that core beliefs may influence the experience of certain sources of stress. In order to help occupational therapists manage their stress better, cognitive strategies need to be utilised to work on the associated irrational beliefs. This will be cost-saving in the long run as it can help reduce attrition and stress-related illnesses.

I017/AH

Does the Burden of Caring for Patients with Schizophrenia Increase or Decrease with Prolonged Caregiving?

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Aim: The caregiving for patients with schizophrenia is a long term commitment. As community policies increasingly shift the responsibility of care to the families, the determination of caregiving burden becomes important. The aim of this study is to compare the short-term and long-term caregivers of these patients to ascertain if the burden increases or decreases with prolonged caregiving

Methods: Caregivers of schizophrenic patients seen at IMH were interviewed using a questionnaire covering demographics and containing instruments to measure psychological distress and caregiving burden. A comparison was made between the 2 groups of caregivers. For mean comparisons, independent 2 sample *t* tests were used while for comparing percentages, Chi-square was used.

Results: One hundred and ninety-eight caregivers were surveyed, 81 were short-term caregivers and 117 were long-term. Some differences were observed. A higher percentage of the long-term caregivers were females, 65.8% compared to 51.9% ($P < 0.047$).

Conclusion: The findings showed that the short-term caregivers were more vulnerable and that with prolonged caregiving, the burden decreases. These findings are useful for service planning.

I018/AH

The Efficiency of Total Contact Inlays in Reducing Plantar Force in Neuropathic Ulcers

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Aim: The total contact inlay (TCI) is a full sock device that reduces pressure over prominent areas and redistributes it evenly over the plantar aspect of the foot. This study aims to ascertain the effectiveness of TCIs in reducing plantar force under neuropathic foot ulcers in order to aid healing.

Methods: A random sample of 19 subjects was taken from patients attending the podiatric clinic at Tan Tock Seng Hospital. The criteria for selection was presence of neuropathy, controlled underlying systemic pathology, good vascularity and presence of plantar neuropathic ulcer graded 2 and below for more than 6 months. Those subjects placed in the Study group were fitted with TCIs while those in the Control group wore their own footwear. They were given podiatric wound care at regular intervals and were followed up over 6 visits. The contact force under the ulcer was measured with the Economic Loading Force system manufactured by Tekscan and the ulcer size was assessed using the Optimas software system.

Results: The results show that the TCI reduces the maximum contact force by 58.28% while normal footwear only 10.07%.

Conclusion: The TCI is effective in reducing plantar force under neuropathic foot ulcers ($P < 0.05$). The ulcer-healing rate and the length of time the subjects wore the TCI showed a positive correlation ($r = 0.898$) suggesting that the longer the subjects wore the TCIs, the faster their ulcers healed.

I019/AH

Dietary Carbohydrate Exchanges and Glycaemic Control of Diabetic Patients – A Prospective Study on the Effect of Dietary Counselling

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Aim: To study the effect of compliance to a controlled carbohydrate exchanges (CCE) with low content of refined sugars diet; on changes in HbA1c in patients with diabetic nephropathy and poor blood sugar control.

Methods: Diabetic patients were selected from a renal clinic. Patients were entered into the study if their HbA1c was above 8.0%; and assessed to be non fully compliant with a CCE diet by a dietitian. After counselling, and 6 months of follow-up, the same dietitian reassessed their compliance to the CCE diet. The changes in compliance were correlated with the changes in the HbA1c. Thirty patients were entered into the study (57% were males). Mean age (\pm SD) was 61 (\pm 9.2) years.

Results: Thirteen patients (43%) improved on their compliance to the CCE diet. Of these, 10/13 (77%) patients had an improvement in HbA1c. Conversely, of the 17 patients who had no improvement in compliance, only 6/17 (35%) patients had an improvement in HbA1c ($P < 0.005$).

Conclusion: Counselling resulted in improvement of compliance to a CCE diet in nearly half of the patients on follow-up. This improvement was associated with a significant improvement in glycaemic control in patients with diabetic nephropathy and poor blood sugar control.

I020/AH

Neuronal Differentiation of Bone Marrow Stromal Cells

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Aim: Recent studies suggest that bone marrow stromal cells (BMSCs) can be differentiated into neuronal cells such as neurons, oligodendrocytes and astrocytes. However, these cells only exist in a small fraction out of the whole total bone marrow cells. This study was designed to isolate these cells and to differentiate them into neurons.

Methods: We cultured and isolated a sub population of mouse BMSCs simply referred to as flat BMSCs with regard to its morphology. These flat BMSCs were further expanded and differentiated using different chemicals and cell cycle inhibitors in driving them to become mature neuronal cells. Preliminary identification of neuronal differentiation was assessed by microscopic observation. RT-PCR, immunocytochemistry and western blotting were carried out to confirm and further characterise these differentiated cells.

Results: Neurogenic differentiation was assessed by RT-PCR, immunocytochemistry and western blotting. Differentiated flat BMSCs were shown to have an increasing expression of neuronal genes such as GAP43, Neurogenin 1 and Tau with respect to the exposure time to differentiation medium. Positive immunocytochemistry staining further confirm the identity of these differentiated cells.

Conclusion: This study shows that flat BMSCs can be differentiated into mature neurons. Flat BMSCs can potentially provide an abundant source of cells for autologous transplantation in treatment of neurological diseases.

I021/CPIP

Improving Clinical Practice of Intravenous Urography

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Aim: To improve the clinical practice of intravenous urography using turnaround time and report generation time as outcome measures.

Methods: A clinical practice improvement programme was implemented in January 2004. Historical data was used as a control. Measurements based on a radiology information system were used to track turn around time for patients and the generation of their reports. Multiple interventions based on brain-storming and multi-user input with interval measurements were used to reduce the measures.

Results: There is a reduction of the average turnaround time from 169 to 87 minutes while the 98% of reports could be generated within 24 hours after completion of the examination. This was achieved by using the collective wisdom of the process owners to build a foundation on which a standard protocol was based. Variation from the protocol was allowed after agreement among the staff involved.

Conclusion: It is possible, practical and profitable to improve clinical

practice using clinical practice programme methodology.

I022/CPIP

Reducing the Use and Duration of Physical Restraints in Disturbed Aggressive and Violent Psychiatric Patients

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Aim: The use of physical restraints is indispensable in Mental Health Institutions such as the Institute of Mental Health, Singapore (IMH). Oftentimes, they are crucial for staff and patient safety. However, restraints are unpleasant and sometimes dangerous. There have been reports of adverse clinical (e.g. DVT) and medicolegal complications. IMH sought to determine if the rates and durations of restraints could be reduced.

Methods: Nursing and medical staff were surveyed as to their beliefs regarding the reasons for over-restraining patients. Many thought that the existing protocols were too far-ranging and that restraints were used as first-line management of disturbed patients. New Restraint Protocols were drawn up and road shows conducted to convince staff of the rationale for the new procedures. Staff (n = 25 doctors and nurses) and patients (n = 10) were then surveyed as to their appreciation of and satisfaction with the new protocols.

Results: Post-implementation, the number and duration of restraints dropped by 74% and 37% respectively. The staff satisfaction survey revealed that most staff understood the need for the new protocol and found it easy to use. Staff generally realised patient safety was now enhanced. The patient satisfaction survey showed that 90% of patients supported the occasional use of restraints and applauded the hospital's initiative to reduce the number and rates of restraints.

Conclusion: It was learnt that reduction of restraints was possible, and patients and staff were happy with this. Future directions will look at other methods of managing violent patients.

I023/CPIP

Reducing Benzodiazepine Prescription at Point of Discharge

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Aim: Patients admitted to the acute wards in Woodbridge Hospital are frequently treated with oral benzodiazepines for management of their anxiety and insomnia but many of these are still being prescribed even at the point of discharge. To prevent dependency and other side effects, it is thus worthwhile to explore the unnecessary continuation of benzodiazepines at discharge.

Methods: The Pareto chart generated by the votes of the team revealed that the main reasons of continuing benzodiazepines at the point of discharge were: 1) medications not reviewed at the time of discharge, 2) patients' request for benzodiazepines and 3) treatment of agitation and insomnia. The interventions carried out included the use of reminders such as attaching reminder note on the computer, the inpatient medical record forms and casenotes. Suitable alternatives such as oral hydroxyzine were used whenever applicable.

Results: After 20 weeks of intervention, the prescribing of benzodiazepines at discharge reduced relatively by 16.28% and 49.89% from baseline in the female and male adult C class wards respectively. The combined results indicated a relative reduction of 30.23% from baseline (Student's *t*-test, $P = 0.00013$). In addition, the sustainability of not prescribing benzodiazepines to patients 10 weeks after discharge was improved relatively by 12.15%.

Conclusion: Benzodiazepines have an important and often indispensable therapeutic role for the short-term management of insomnia and anxiety symptoms. However, the risk of dependency can be minimised if one is mindful to review the need of continuing the medication at the point of discharge.

I024/CPIP**Reducing the Rate of Negative Appendicectomies – A Clinical Practice Improvement Project**

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Aim: Appendicectomy is a common emergency surgical procedure. Between January 2001 and June 2002, more than 900 appendicectomies were carried out in our institution. Analysis of our data showed a negative appendicectomy rate of 17.9% (9.3% males and 26.8% females). Appendicular perforation incidence was 6.6%. A Clinical Practice Improvement Programme (CPIP) project was initiated to reduce the negative appendicectomy rate.

Methods: A CPIP team was formed and looked into the potential factors influencing the relevant appendicectomy rates. A clinical protocol for the evaluation of patients with acute appendicitis was instituted by the general surgical department. Prospective data were collected on patients undergoing appendicectomies.

Results: For the study period September 2002 to December 2003 (excluding the SARS period), a total of 395 appendicectomies were carried out (61.2% males and 38.8% females). The overall negative appendicectomy rate was reduced from 17.9% to 11.6% (8.6% for males and 16.9% for females). The incidence of perforation was 7.3%.

Conclusion: Utilising the CPIP process, we were able to reduce our negative appendicectomy rates significantly. This resulted in reducing unnecessary appendicectomies, avoiding postoperative complications and savings in resources for both the patient and the institution

I025/CPIP**To Reduce the Waiting Time for Both Laboratory Testing and Treatment Procedures in the Subsidised Clinics by 30% from 15 minutes to 10 minutes Within 6 Months**HL EE¹, SC LEE², GT LIM³*¹Medical, National Skin Centre, Singapore, ²Department of Laboratory, National Skin Centre, Albania, ³Department of Nursing, National Skin Centre, Singapore*

Aim: A survey on 178 patients was carried out to assess the satisfaction of patients waiting for the above test. The survey showed that all patients appreciated minimal waiting and half of the patients felt a reasonable waiting time for laboratory test was 5-10 minutes while the other half felt it was 11-15 minutes. The average waiting time for a laboratory test is 16.4 minutes. Prior to project implementation, all patients with laboratory investigations will be directed to T1/T2. The nursing staff will then inform the laboratory staff a procedure needs to be performed.

Methods: CPIP methodology (cause and effect brainstorming, pareto charts and a review of workflow processes) was employed. We concluded that a change in work processes is required. Patients requiring blood investigations and treatment will continue at T1/T2. The Laboratory for scraping purposes will be renamed T3 and patients requiring skin scraping will proceed to T3.

Results: Waiting times for laboratory procedures at T3 was improved from 16.4 minutes to 8.0 minutes (51.2% reduction) and patient dissatisfaction reduced from 73.4% to 0% (100.0% reduction). Investigations at T1/T2 on the other hand was improved to 2.7 minutes from 6.7 minutes (59.7% reduction) and the patients dissatisfaction at T1/T2 was 0% from 12.5% (100.0% reduction) This improvement translates to 0.5 and 0.25 fixed term equivalent for laboratory staff and nursing staff respectively.

Conclusion: Not only can we fully meet patient's requirement and expectations with simple measures and at low cost but also translate it into cost savings for the centre.

I026/MPC**Severe Acute Respiratory Syndrome (SARS)-related Acute Respiratory Distress Syndrome (ARDS): Predicting the Clinical Outcome from Ventilatory Parameters**TK KWEEK¹, TWK LEW¹, A EARNEST², Y CHAN¹, S LOO¹*¹Department of Anaesthesia, Tan Tock Seng Hospital, Singapore, ²Department of Clinical Epidemiology, Tan Tock Seng Hospital, Singapore*

Aim: We noted in our cohort of 46 critically-ill SARS patients that some had

a short course of acute respiratory distress syndrome (ARDS) while others had a protracted course complicated by multi-organ dysfunction with high mortality. We hypothesised that this difference could be predicted earlier from ventilatory parameters (VP) measured at the bedside.

Methods: From 6 March to 6 June 2003, there were 39 ICU patients with probable SARS who required intubation and mechanical ventilation (MV). We employed a low-tidal-volume lung protective ventilation strategy, using volume or pressure control, in all patients. Based on the duration of MV, we divided patients into 2 groups (gp): Early Recovery (ER) gp if 14 days of MV were needed or if the patient died while on MV. The VP on D1, 4 and 7 were determined retrospectively from chart review and compared using the Mann Whitney test.

Results: VP were similar in both gps on D1 and 4 except for lower minute ventilation (mV) on D4 in the ER gp [9.0 vs 11.5, $P = 0.029$]. On D7, ER gp had significantly lower plateau pressures (Ppr) [25.3 vs 32.0, $P = 0.025$], mV [8.9 vs 11.9, $P = 0.021$] and FiO₂ [0.5 vs 0.7, $P < 0.001$] and higher PaO₂/FiO₂ ratios [203.8 vs 114.7, $P = 0.008$] compared to the LR/M gp.

Conclusion: Patients with SARS related ARDS on MV who recover early tend to improve by D7 of MV and can be identified by improvements in their Ppr, FiO₂, PaO₂/FiO₂ ratio and mV measured at the bedside.

I027/MPC**Aortic Valve Calcification Relates to Severity of Aortic Valve Stenosis But Not Coronary Artery Calcification**MY Y CHAN¹, KK POH¹, KY SETO², HH YANG³, LH LING³*¹Department of Cardiology, National University Hospital, Singapore,**²Department of Diagnostic Imaging, National University Hospital, Singapore,**³Department of Cardiology, National University of Singapore, Singapore*

Aim: Aortic valve and coronary artery calcification are common in the elderly. Incidental aortic valve calcium (AVC) is often detected during computed tomography for coronary artery calcium (CAC) scores. We aim to determine the relationships between AVC, valvular stenosis and CAC.

Methods: Multislice detector computed tomography (MDCT) was performed in 57 patients (39 with significant stenosis, 12 sclerosis, 6 normal) to determine the extent of AVC and CAC. MDCT AVC was compared to echocardiographic indexes of aortic stenosis.

Results: Mean patient age was 68 ± 11 years with 60% males. The older cohort tended to have more calcification in the coronary arteries ($r = 0.41$, $P = 0.002$) and aortic valves ($r = 0.37$, $P = 0.005$). There was no significant difference in AVC and CAC between the genders ($Z = -0.9$, $P = 0.4$). AVC ranged from 0-7549 AU (medium = 515 AU) and CAC ranged from 0-8592 AU (medium = 303 AU). There was an inverse relation between the AVC and the degree of valvular opening (Spearman's $r = -0.75$, $P = 0.2$).

Conclusion: Both AVC and CAC increase with the age of patients. AVC on MSCT predicts severity of aortic stenosis. Heavy calcification suggests the presence of significant aortic stenosis that requires cardiologist assessment. MDCT AVC was not significantly correlated to CAC and may not be useful as a marker for coronary artery disease in the elderly.

I028/MPC**Echocardiographic Predictors of Elevated N Pro in Patients with Aortic Valve Stenosis**MY Y CHAN¹, KK POH¹, HH YANG², LH LING²*¹Department of Cardiology, National University Hospital, Singapore,**²Department of Cardiology, National University of Singapore, Singapore*

Aim: Natriuretic peptide (NT-proBNP) is elevated in symptomatic patients with aortic stenosis (AS) and may be a biochemical marker for AS severity. The relationships between NT-proBNP levels and the functional effects of AS on the LV myocardium in patients with normal LV ejection fraction (EF) have not however been adequately elucidated.

Methods: Transthoracic echocardiography was prospectively performed in 34 consecutive points with variable degrees of AS and EF > 50%. Indexes of AS severity, systolic and diastolic function, and indexed left atrial and LV dimensions and LV mass were obtained. Spectral pulsed-wave tissue Doppler imaging (TDI) was performed at the septal and lateral corners of the mitral annulus. NT-proBNP plasma levels were measured independently.

Results: Mean patient age was 71 ± 12 years with 56% males. The mean

indexed aortic valve area (AVAI) was $0.63 \pm 0.23 \text{ cm}^2/\text{m}^2$. Severe (AVAI $0.75 \text{ cm}^2/\text{m}^2$) AS was present in 11, 10 and 13 points, respectively. NT-proBNP levels ranged from 23 to 35,000 ng/L (median 485 ng/L). Univariate predictors of elevated NT-proBNP were late diastolic mitral annular (A') velocities at both septal ($P = 0.02$) and lateral ($P = 0.009$) corners and indexed LV mass ($P = 0.04$) but not AVAI ($P = 0.24$). When conventional Doppler indexes of diastolic function, TDI diastolic velocities, indexed left atrial dimension and LV mass index were entered into a linear regression model, the sole independent predictor of NT-proBNP levels was lateral annular A' velocity ($\beta = 0.48$, $P < 0.01$)

Conclusion: Late diastolic annular velocities best-predicted (inversely) NT-proBNP levels in patients with AS and normal EF. This observation underscores the importance of atrial booster pump function in the pathophysiology of AS.

I029/MPC

Prevalence of Depression in Singapore – Results of the National Mental Health Survey of the Elderly 2003

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Aim: The proportion of the elderly ≥ 65 years in the population of Singapore is 7.6% and is increasing rapidly. The 3 main ethnic groups are the Chinese (77%), Malay (14%) and Indians (8%). This study aims to provide nationally representative estimates of the prevalence of depression in the elderly population of Singapore.

Methods: A cross-sectional community survey of a national ethnically-stratified random sample of older adults 60 years and above ($N = 1092$) was conducted. The Geriatric Mental State Examination (GMS) and the Automated Geriatric Examination for Computer Assisted Taxonomy (AGECAT) were used to diagnose depression.

Results: The overall population-weighted prevalence of depression for older adults ≥ 60 years, ≥ 65 years and ≥ 75 years were 3.1%, 3.5% and 3.9% respectively. The prevalence of depression in the age groups 60-64 years, 65-74 years, ≥ 75 years were 2.2%, 3.3% and 3.9% respectively (statistically insignificant). Among elderly ≥ 65 years old, the prevalence of depression in males and females was 3.2% and 3.8% respectively, (statistically insignificant); the prevalence of depression in Chinese, Malays and Indians were, 2.8%, 6.5% and 6.8% respectively. Gender-ethnic interaction was statistically significant ($P = 0.017$), being lowest in Chinese males (2.5%) and highest in Indian females (12.7%).

Conclusion: These nationally representative estimates of depression in the elderly population in Singapore identify gender and ethnic subgroups at high risk for further investigation and targeted intervention.

I030/MPC

Reversibility of Pulmonary Hypertension in Thyrotoxicosis (REPHIT Study)

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Aim: We aimed to test the hypothesis that thyrotoxicosis was a reversible cause of otherwise unexplained pulmonary hypertension.

Methods: All thyrotoxic patients with transthoracic echocardiograms (TTE) done before treatment were reviewed ($n = 115$). We found 20 patients with pulmonary artery systolic pressure (PASP) more than 40 mmHg (measured using tricuspid regurgitant maximum velocity plus estimated right atrial pressure), free thyroxine (FT4) more than 20 pmol/L and thyroid stimulating hormone (TSH) less than 0.05 mIU/L (20 patients). All 20 patients had a left ventricular ejection fraction (LVEF) more than 55% and there were no other significant echocardiographic abnormalities or pulmonary disease. 13/20 were recalled for a repeat TTE after they were rendered euthyroid. The difference in FT4 and PASP before and after treatment was calculated. P values were derived using the Wilcoxon Signed Ranks test.

Results: The median FT4 was 56.8 pmol/L at the 1st TTE and 13.9 pmol/L at the 2nd TTE with a median reduction in FT4 of 52 (range 8.2-88.2) pmol/

L, P value 0.005. There was a reduction in PASP from the 1st (median of 51 mmHg) to 2nd TTE (median of 36 mmHg) for all patients with a median reduction of 12 (range 1-33) mmHg, $P = 0.005$.

Conclusion: Thyrotoxicosis is a rare, reversible cause of pulmonary hypertension. A thyroid function test should thus be included in the workup of patients with otherwise unexplained pulmonary hypertension.

I031/MPC

Oral Sildenafil Therapy Improves Functional Class, 6-Minute Walk Test Distance and Physical Conditioning in Pulmonary Arterial Hypertension

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Aim: Treatment of pulmonary arterial hypertension (PAH) with continuous intravenous prostacyclin infusion is associated with high cost and complications related to delivery mechanisms. We aimed to determine if phosphodiesterase-5 inhibitor (sildenafil) may benefit PAH patients at reduced cost.

Methods: Fourteen patients (5 female, 9 male), aged 40 ± 17 years, with moderate to severe PAH, (5 primary pulmonary hypertension, 7 collagen vascular disease, 2 Eisenmenger syndrome) received oral sildenafil of mean daily dosage 154 ± 13 mg. Eleven (79%) patients were in WHO classes 3-4. These patients were followed up for 3 months with serial assessment of 6-minute walk test distance, WHO functional status, BORG dyspnoea score, pulmonary artery systolic pressures (PASP) via doppler echocardiography and Rand SF-36 Health Survey questionnaires.

Results: After 3 months of follow up, the WHO functional class improved from 3 ± 1 to 2 ± 1 ($P = 0.002$). Six-minute walk test distance improved from 275 ± 144 m to 387 ± 157 m ($P = 0.017$). BORG dyspnoea score also improved from 2.4 ± 2.5 to 0.6 ± 1.2 ($P = 0.1$). There was however no significant change in PASP, from 99.7 ± 24.0 mmHg to 93.6 ± 29.2 mmHg ($P = 0.1$). The "physical functioning" score in Rand SF-36 questionnaires showed significant improvement from 36 ± 10 to 70 ± 19 ($P = 0.004$).

Conclusion: Oral sildenafil therapy is effective in improving WHO functional class, exercise distance and physical conditioning scores in patients with PAH.

I032/MPC

Prediction of Endpoints in Patients with Renal Impairment by Nuclear and Echo Imaging Perined

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Aim: In patients with renal impairment. Left ventricular ejection fraction (LVEF) determined by echocardiography does not predict endpoints well because of variability in intravascular volume with diuretic use and dialysis. We hypothesise that the left atrial (LA) diameter may be a better predictor as the left atrial volume remains relatively stable despite fluctuations in intravascular volume.

Methods: We recruited 207 patients with serum creatinine above 150 mmol/L suspected to have coronary artery disease (CAD) without a prior history of myocardial infarction or stenosis $>50\%$ on prior coronary angiography. All patients had a resting echo-doppler and MPI scan performed. The LA diameter was measured by M-mode in the parasternal short-axis view and divided by the patient's body surface area to derive the LA diameter index. All patients were followed up for 24 months with the composite endpoint being all cause mortality and non-fatal myocardial infarction.

Results: Patients with an LA diameter index ≥ 22 (odds ratio 0.32; 95% CI, 0.28-0.41). Patients with a normal MPI scan also reached the endpoint less often (odds ratio 0.49; 95% CI, 0.29-0.67). Other significant predictors of the endpoint were age, presence of diabetes mellitus and LVEF.

Conclusion: In patients with renal impairment suspected to have CAD, a LA diameter index less than 22 cm^2/m^2 significantly predicts infarct-free survival at 24 months better than a normal MPI scan.

I033/MPC**Hemodynamic Significance of Mitral Stenosis: Utility of a Simple, Novel Index by 2-dimensional Echocardiography**SC SEOW¹, LP KOH¹, TC YEO¹¹Department of Cardiology, National University Hospital, Singapore

Aim: Assessment of mitral valve area by planimetry is accurate but operator dependent. It is technically challenging to determine the narrowest part of the "mitral funnel". Measuring the separation of the leaflet tips could be a simple and accurate surrogate measure of the mitral valve area.

Methods: We measured the distance between the tips of the mitral leaflets in mid-diastole in the parasternal long and apical 4 chamber views in 76 patients with mitral stenosis. The average of these 2 parameters was calculated to yield the MS Index. All measurements were obtained from the mean of 3 beats for patients in sinus rhythm and 5 beats for those with atrial fibrillation. The Index was then compared with 2 reference methods of mitral stenosis severity: mitral valve area by planimetry and pressure half-time.

Results: There was good correlation between the Index and mitral valve area by planimetry ($r = 0.907$, $P < 8$ mm and all patients with mild stenosis had a MS Index of >11 mm).

Conclusion: The MS Index is a simple, novel and reliable measure of mitral stenosis severity.

I034/MPC**Impact of Left Ventricular Diastolic Dysfunction on Left Atrial Remodelling and Function a Volumetric Analysis**SG TEO¹, H YANG², C PING¹, TC YEO¹¹Department of Cardiology, National University Hospital, Singapore,²Department of Cardiology, National University of Singapore, Singapore

Aim: Diastolic dysfunction may result in elevation of left ventricular and atrial pressures, resulting in left atrial (LA) remodelling. The aim of this study was to examine the effects of left ventricular diastolic dysfunction on LA remodelling and function.

Methods: We measured LA volume and function in 105 patients. Maximal (Volmax) and minimal LA volumes were measured using the ellipsoid method. LA Volmax was then indexed to the body surface area (BSA). The passive filling, conduit and active emptying volumes were estimated and corrected for BSA and LA Volmax.

Results: Indexed LA Volmax was strongly associated with diastolic function grade (Spearman $P < 0.0001$, $r_s = 0.701$). Compared to normal controls, corrected passive filling and conduit volumes were lower, and corrected active emptying volume was higher in patients with grade 1 diastolic dysfunction (0.38 vs 0.51, $P = 0.007$; 1.69 vs 3.29, $P < 0.0001$; 0.59 vs 0.44 $P = 0.001$), resulting in a similar corrected total emptying volume (0.97 vs 0.96, $P = ns$). Patients with higher grades of diastolic dysfunction, however, had lower corrected passive filling, conduit, active and total emptying volumes.

Conclusion: LA remodelling occurs in patients with diastolic dysfunction and LA volume expressed the severity of the diastolic dysfunction. Initially, the atrium compensates for changes in LV diastolic properties by augmenting active atrial contraction. As the severity of the diastolic dysfunction increases, this compensatory mechanism fails as atrial mechanical dysfunction sets in, resulting in lower total atrial emptying volume

I035/MPC**Novel Acoustic Analysis Predicts Severity of Aortic Valve Stenosis**MYY CHAN¹, KK POH¹, ZY SUN², HH YANG³, CH CHEW², LH LING³¹Department of Cardiology, National University Hospital, Singapore, ²Dept of Mechanical Engineering, National University of Singapore, Singapore,³Department of Cardiology, National University of Singapore, Singapore

Aim: Phonocardiographic spectral ratios have been used to evaluate aortic stenosis (AS) severity. Using echocardiography as a non-invasive gold standard, we devised and assessed a new and more accurate wavelet-based acoustic method of quantifying AS severity.

Methods: ECG-gated acoustic data recorded with an electronic stethoscope with digital output were acquired from the praecordial aortic areas of 66 patients (22 in each group of severe AS, mild-to-moderate AS and sclerosis-

normal). These were subjected to energy based continuous wavelet transformation (CWT). A multi-peak detection computer algorithm was developed to extract the dominant frequency (DF) of the systolic murmur from CWT. Fast Fourier transformation was also performed to determine the spectral ratio of the high to low frequency range (Eh/EI). These parameters were compared to echocardiographic indexes of AS, determined independently.

Results: Mean patient age was 69 ± 11 years with 59% males. AVA ranged from 0.48 to 3.51 cm² (mean = 1.42 ± 0.75 cm²), DF from 30 to 350 Hz (medium = 100 Hz) and Eh/EI from 0.007 to 0.703 (medium = 0.455). The DF correlates with echocardiographic indexes were: aortic valve area ($r = -0.55$, $P \leq 0.001$), mean transvalvular gradient ($r = 0.53$, $P < 0.001$), aortic valve resistance ($r = 0.58$, $P < 0.001$), stroke work loss ($r = 0.60$, $P < 0.001$) and dimensionless index ($r = -0.55$, $P < 0.001$). The respective correlates for Eh/EI were: $r = -0.35$, $P = 0.010$ (valve area), $r = 0.37$, $P = 0.005$ (mean gradient), $r = 0.39$, $P = 0.006$ (valve resistance), $r = 0.42$, $P = 0.001$ (stroke work loss) and $r = -0.35$, $P = 0.008$ (dimensionless index).

Conclusion: Novel acoustic analyses hold promise for the evaluation of AS. Compared to spectral ratio, wavelet DF correlates better with AS severity. In technically difficult echocardiographic studies or cases of uncertain stenotic severity, this method of rapid non-invasive analysis provide additional value.

I036/MPC**Angiotensin Converting Enzyme Inhibitor and the Prevalence of Cough**TW WONG¹, XH HUANG¹, BT NG², W LIU¹¹Department of Cardiology, Tan Tock Seng Hospital, Singapore, ²Department of Pharmacy, Tan Tock Seng Hospital, Singapore

Aim: The most common side effect of angiotensin converting enzyme inhibitor (ACEI) therapy is cough. Cough affects compliance and is the most common reason for patient withdrawal from treatment. We aim to establish the prevalence and nature of ACEI-induced cough in Singapore.

Methods: This is a cross-sectional retrospective study of outpatient population in a tertiary hospital. Inclusion criteria were all patients who were taking ACEI or Angiotensin II receptor blocker (ARB) to replace ACEI cough.

Results: Six hundred and twenty-six patients were surveyed and 52 patients were excluded from our study. Of the remaining 574 patients, prevalence of cough was 32.8%. Mean age for patients who cough was higher; (66 SD:11) vs (63 SD:12) years. 41.6% of females taking ACEI had cough compared to 27.5% of male patients. There were no differences in underlying medical condition. Prevalence of cough was not dose related or ACEI specific. In the subgroup of 188 patients with cough, 56 (29.8%) patients reported severe cough, 129 (68.5%) patients coughed almost daily, 65 (34.6%) patients had nocturnal cough. Seventy-five (40%) patients had sleep disturbances from cough. Seventy-nine (42%) patients who cough were able to tolerate the cough. Eighty-seven (15.1% of 574) patients had to discontinue ACEI therapy.

Conclusion: This study indicates that cough is a common side effect of treatment with ACEI in Singapore population. Fifty-eight per cent of patients who cough required either cough remedies or discontinuation of ACEI. We recommend counselling all patients about the possible occurrence of cough before commencement of ACEI therapy.

I037/MPC**Scabies Outbreak in a HIV Unit**IH ESCUDERO¹, MIC CHEN¹, A EARNEST¹, YA LEO²¹Department of Clinical Epidemiology, Tan Tock Seng Hospital, Singapore,²Department of Infectious Disease, Tan Tock Seng Hospital, Singapore

Aim: To describe a protracted outbreak of scabies in a HIV unit, the role of informal living arrangements as a reservoir and measures instituted following recognition of outbreak.

Methods: Epidemiologic investigation consisting of a case-control study among HIV patients and staff of affected ward, outpatient clinic and Patient Care Centre to identify cases. AIDS status of all HIV patients was also noted. Empiric treatment with 1 dose of topical Malathion 0.5% was administered to all symptomatic HIV patients, those with exposure to the affected ward and PCC and all patients with positive skin scrape. Patients with persistently positive skin scrapings were given a second dose of Malathion 0.5% and

subsequent oral dose of Ivermectin.

Results: Nine cases of scabies were identified between May and October 2003. A second cluster of 4 cases was noted in January 2004 with 2 patients having a recurrence, a result of informal living arrangements. Risk factors for being infested with scabies among HIV patients include low CD4 count (OR: 1.29; 95% CI, 1.07-1.56) for every halving in values and not on anti-retroviral therapy (ART) (OR: 6.16; 95% CI, 1.06-35.90).

Conclusion: Protracted outbreaks of scabies can occur in HIV units. The difficulty in diagnosing Norwegian scabies and the mingling of inpatients with outpatients in both institutional and non-institutional support structures make for a challenging exercise in outbreak control. Scabitic infestations in HIV units should be treated with respect, and epidemiologic investigations and containment measures must look beyond institutional boundaries to find potential reservoirs.

I038/MPC

Database of Contact and Occupational Dermatoses Clinic in a Tertiary Referral Dermatological Centre

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Aim: The skin serves as an inter-phase between our bodies and the external environment. It protects us against environmental insults. In the course of our daily activities and work, we are constantly exposed to substances that can trigger a cutaneous reaction such as irritant contact dermatitis and allergic contact dermatitis. The aim of this poster is to present the prevalence and types of occupational and contact dermatitis seen in a tertiary dermatological centre and determine the most frequent triggers for these dermatitis.

Methods: This is a retrospective study. An on-line database collects epidemiological data of patients seen in occupational and contact dermatitis clinic in National Skin Centre over 22 months, from 21st March 2002 to 30th December 2003. It also records the results of the patch tests that were performed for the patients. (Test outcome was determined on the 3rd and 7th day post test).

Results: The most common dermatitis seen are allergic and irritant contact dermatitis. Nickel, dichromates and cobalt chlorides are among the common triggers.

Conclusion: Occupational and contact dermatitis results in man-hour loss, thus it has an economic impact. It is important to identify the common triggers so that preventive measures can be instituted into work place and patients can be educated so as to reduce incidence of such dermatitis.

I039/MPC

Adverse Skin Reactions to Personal Protective Equipment Against SARS

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Aim: Since the discovery of SARS, healthcare workers caring for patients in affected countries are exposed to regular use of personal protective equipment (PPE) such as the N95 mask, gloves and gowns, often using the equipment for hours at a time. Our aim is to determine the prevalence of adverse skin reactions to PPE amongst healthcare staff in Singapore hence determining whether PPE use poses a significant occupational health risk.

Methods: The target population was staff in National Skin Centre and the Departments of Emergency and Intensive Care in Tan Tock Seng Hospital. Questionnaires were used pertaining to the duration of use of PPE and adverse skin reactions arising from their use.

Results: Of those asked to participate, 322 (94.7%) agreed. 14.3% of respondents were doctors, 73.0% nurses, and 12.7% comprised other ancillary staff. Ages ranged from 20 to 63 years, the majority were female (85.7%) and Chinese (53.7%). 109 (35.5%) of the 307 who used masks regularly reported acne (59.6%), facial itch (51.4%) and rash (35.8%) from N95 use. 64 (21.4%) of the 299 who used gloves regularly reported dry skin (73.4%), itch (56.3%) and rash (37.5%). Only 4 (1.6%) of the 258 who wore gowns regularly reported itch (100%) and rash (75%).

Conclusion: The use of PPE, in particular, the N95 mask, is associated with high rates of adverse skin reactions. There is a need to find suitable

alternatives for affected staff and to encourage awareness among staff of the role of dermatologists in their care.

I040/MPC

Spectrum of Skin Disorders Among HIV Patients in Singapore and its Relationship to the Degree of Immunosuppression

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Aim: Skin disorders are extremely common in and of significant morbidity to HIV-infected individuals. However, data on its prevalence and association with CD4 count among Asians are lacking.

Methods: This cross-sectional study examined skin disorders among HIV-positive outpatients in Communicable Disease Centre between August 2003 and February 2004. Information collected included current and past skin problems, corresponding CD4 count, antiretroviral therapy and HIV transmission modes. The association between disease prevalence with CD4 count was evaluated using univariate and multivariate analyses.

Results: Ninety-six patients (Male:Female = 8:1) were enrolled. The most common mode of HIV transmission was heterosexual (75%) followed by homosexual/bisexual contacts (22%) and intravenous drug abuse (3%). The distribution of patients in terms of current CD4 cell counts was 38.5%.

Conclusion: The high prevalence of psoriasis, PPE and adverse drug eruptions relative to cutaneous infections, together with the absence of skin tumours, distinguish this report from western studies. Low CD4 cell count is significantly associated with psoriasis, PPE and adverse drug eruptions.

I041/MPC

Cardiovascular Risk in Patients with First Episode Psychosis

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Aim: Patients with schizophrenia, schizoaffective disorder, and affective psychosis are at increased risk of having risk factors for cardiovascular diseases. Aim: To describe the cardiovascular risk profile of drug-naive patients diagnosed with schizophrenia, and assesses the risk of coronary heart disease based on the Framingham Heart Study.

Methods: Subjects are recruited from the Early Psychosis Intervention Programme. Control data were obtained from a representative cohort of the general population. Risk factors were obtained based on history and relevant laboratory investigations.

Results: Our patients were at higher risk of coronary heart disease, based on their risk scores as tabulated by the Framingham Heart Study. From our study results, patients were twice as likely as the control group to develop coronary heart disease ($P < 0.001$). The major contributing factor to patients' increased risk was the higher prevalence of smoking in patients (32.29%) compared to the control group (7.65%).

Conclusion: Interventions directed at smoking cessation should be targeted at patients with first episode psychosis.

I043/MPC

Who Dies Within 24 Hours of Admission from the Emergency Department?

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Aim: To describe the characteristics of patients who died within 24 hours of admission from the Emergency Department (ED).

Methods: Computer records from the Tan Tock Seng Hospital Office of Quality Management and the ED were obtained for all patients admitted by ED from 1 September 2003 to 31 January 2004. Patients who died within 24 hours of admission from ED were identified and retrospective chart reviews were done.

Results: The ED admitted 18,296 patients during the study period of which

145 (0.8%) died within 24 hours of admission. There were 84.8% Chinese, 6.2% Indian, 6.2% Malay and 2.1% other ethnic groups. The mean age of 69 years (Standard deviation [SD] 15.3) of the 85 (58.6%) men was significantly younger ($P = 0.001$) than 76.8 years (SD 12.4) of the 60 (41.4%) women. ED diagnoses were classified as infective (31.7%), cardiac (20.7%), neurological (13.8%), malignancy (9.7%), surgical and multiple trauma (9.6%), endocrine (4.4%) and others (8.3%). The commonest diagnoses were pneumonia (18.4%), coronary events (12.4%) and sepsis (11.3%).

Conclusion: Most of the 24-hour deaths occurred in the elderly with infective and cardiac causes accounting for over 50% of the deaths. Further studies are required to assess the ED management of these patients.

I044/MPC

A Profile of Male Victims of Domestic Violence Presenting to an Emergency Department in Singapore

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Aim: Male victims of domestic violence have received considerably less attention than female victims. The characteristics of male victims are poorly understood. We attempt to profile male victims of intimate partner violence, and investigate the differences in the characteristics of male and female victims presenting to an emergency department in Singapore.

Methods: 149 patients, presenting with injuries inflicted by their partner, were surveyed. Their demographics, education levels, assault characteristics and knowledge of help services were analyzed and compared.

Results: 9.4% of the victims were male. The proportion of elderly (42.9% vs 5.9%; $P < 0.0001$) and tertiary educated (35.7% vs 10.4%; $P = 0.022$) victims was significantly higher amongst male compared to female victims. Males were more likely to be face weapon-assaults (50.0% vs 10.4%; $P < 0.0001$) and suffer open wounds (50.0% vs 10.4%; $P < 0.0001$) than females. Majority of males confess to previous abuse (78.6%), while female victims were more likely to report their first abuse (77.0%; $P < 0.0001$). Males and females were equally aware of social and legal services.

Conclusion: Male domestic violence is a significant issue and deserves greater attention. Male victims of intimate partner are enduring years of abuse before coming forward. The severity of injury at the time of presentation is greater. Furthermore, our results suggest that male domestic violence is more common amongst well-educated couples.

I045/MPC

Addiction Inpatient Rehab Programme – Improving Attendance at Psychoeducation Sessions

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Aim: To increase attendance rate at our psycho-educational sessions from a baseline 58% to above 70%. Our inpatient addiction ward at Institute of Mental Health caters to multiracial and multilingual addicts who have chronic alcohol/substance dependence with multiple substance related and social problems requiring inpatient detox and rehab services.

Methods: Using the Plan Do Study Act (PDSA) method, we focused on various strategies after brainstorming our cause and effect diagram. We identified 4 areas delineated by our pareto chart, namely poor insight, feeling sick excuses, no programme variety and limited medium of instruction for immediate improvements.

Results: At 15 weeks' post-intervention, we found a mean average attendance of 74.3%, significantly above our baseline rate of 57.8%. When adjusted to exclude the low holiday segment occupancy period (Chinese New Year), the attendance rate was 77.2% compared to baseline. Our patient satisfaction score was found to be 81.2%.

Conclusion: A range of specific strategies targeted at the main causal factors could be combined for optimal outcomes in both attendance rates and patient satisfaction. Such strategies include a combination of strategies involving motivational enhancement, social problem assistance, physical examination, staff monitoring, creative involvement and interactions with ongoing multilingual translations and interpretations.

I046/MPC

Risk Factors for Depressive Disorders in Singapore Adults

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Aim: This epidemiological study set out to determine the risk factors for Depressive Disorders in the adult population of Singapore.

Methods: A stratified random sample of 2847 adults aged 20 to 59 years in the general population was assessed for the presence of Depressive Disorders. The diagnostic instrument used was Schedule for Clinical Assessment in Neuropsychiatry (SCAN). Social, economic and demographic details were recorded.

Results: The 161 individuals diagnosed to have Depressive Disorders (Major Depressive Disorder or Dysthymia) were compared to 2868 without the diagnosis. Univariate and multivariate analyses revealed that monthly income $< \$3000$ ($P = 0.000$), being unemployed, part-time employed or retired ($p = 0.001$) were significant economic risk factors associated with Depressive Disorder. Being widowed ($P = 0.001$), divorced/separated ($P = 0.001$), having never married ($P = 0.001$), and living alone ($P = 0.001$) were significant social risk factors. The presence of one or more medical problems ($P = 0.001$), a family history of mental illness ($P = 0.001$) and the occurrence of one or more threatening experiences ($P = 0.001$) were the other significant risk factors identified. After accounting for these factors, females and Chinese and Indians remained more likely to have Depressive Disorder.

Conclusion: Understanding the risk factors that predispose individuals to depression is essential in the management of the disorder. Awareness of the risk factors and the use of suitable screening measures by primary care providers for at-risk individuals may result in early detection, effective interventions, and reduced disability in individuals suffering from Depressive Disorders.

I047/MPC

The Prevalence of Psychiatric Disorders in Singapore Adults

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Aim: This landmark epidemiological study set out to determine the prevalence of recent psychiatric disorders in the adult general population.

Methods: A random sample, stratified by ethnicity, of adults aged 20 to 59 years living in the community were screened in 2003 for the presence of mental health disorder with the General Health Questionnaire (GHQ-12), and those scoring ≥ 2 were administered the Schedule for Clinical Assessment in Neuropsychiatry (SCAN) which generated the diagnoses of Anxiety and Depressive Disorders. Of 3875 individuals contacted, 2847 participated in the study (response rate: 75.2%).

Results: A total of 228 subjects were identified as having psychiatric disorders, including 40 cases which were not identified by SCAN as cases but were on psychiatric treatment. Only a total of 62 cases (27%) were on psychiatric treatment. Among 188 SCAN detected cases, only 36 (19%) reported having a mental health problem. The population-weighted recent prevalence of psychiatric disorders (SCAN and Non-SCAN cases) was 8.2% (95% CI 6.6-9.8). The prevalence of Depressive Disorders (Major Depressive Disorder and Dysthymia) was 4.9% (95% CI 3.7-6.2); female: 5.5% (95% CI 4.0-7.1), male: 4.3% (95% CI 2.4-6.3). The prevalence of Depressive Disorders was lowest in Malay males: 2.5% (95% CI 0.7-4.2), and highest in Indian females: 7.7% (95% CI 5.5-9.9).

Conclusion: This study shows that psychiatric disorders significantly affect the adult population of Singapore. These important findings should drive effective allocation of resources for case management. Early detection of these disorders in sub-populations at higher risk should result in improved treatment outcomes and reduced disability.

I048/MPC**Evaluation of Osteoporosis Treatment After a Fragility Hip Fracture**R RAMASON¹, WS LIM¹, YY SITOH¹, NH ISMAIL¹, HP WONG²¹Department of Geriatric Medicine, Tan Tock Seng Hospital, Singapore,²Department of Orthopaedic Surgery, Tan Tock Seng Hospital, Singapore

Aim: Hip fractures are a serious consequence to osteoporosis and are associated with substantial morbidity and mortality. The primary objective of this study was to assess if osteoporosis treatment was initiated in patients admitted with osteoporotic hip fracture. Secondary objectives included the evaluation of the rate of institutionalisation in the elderly post hip fracture.

Methods: A retrospective chart review was carried out on 216 consecutive patients admitted to Tan Tock Seng Hospital with a new low-energy hip fracture from January to December 1999. Osteoporosis treatment included supplemental calcium (alone or with vitD) or antiresorptive therapy (bisphosphonates, SERMs). A retrospective chart review was done to show the place of discharge from acute hospital or community hospital.

Results: A total of 216 case notes of patients with hip fractures were analysed. 164 (76%) were women; mean \pm SD age at time of fracture was 80.7 ± 9.1 years and 52 (24%) were men with mean age of 76.3 ± 10.1 years. 63% were given treatment for their osteoporosis, 31% did not receive treatment for osteoporosis, 6% died before discharge. Furthermore, 21% had nursing homes as their final discharge destination.

Conclusion: The osteoporosis treatment rate in our cohort compared very favourably with results of other studies conducted around a similar period (typically 4%-29%) treatment rate on discharge. Hip fracture is a risk factor for institutionalisation with 11% community dwellers eventually going to nursing homes post discharge.

I049/MPC**Risk Factors Associated with Depression in Older Adults in Singapore**PC CHIAM¹, TP NG², A ANG¹, PS ONG¹, LL TAN¹, EH KUA²¹Department of Geriatric Psychiatry, Institute of Mental Health/Woodbridge Hospital, Singapore, ²Department of Psychological Medicine, National University of Singapore, Singapore

Aim: To examine risk factors associated with depression in older adults.

Methods: We analysed data of subjects with depression ($n = 48$) and without depression ($n = 1044$) from a cross-sectional study of a national ethnically-stratified random sample of 1092 older adults aged 60 years and above living in the community. Depression was diagnosed using the Geriatric Mental State Examination (GMS) and Automated Geriatric Examination for Computer Assisted Taxonomy (AGECAT) was used to diagnose depression. Risk factors examined included social, economic and medical data.

Results: Significant independent risk factors identified from weighted multivariate logistic regression analyses were Malay ethnicity (OR = 2.9 vs Chinese), being self-employed (OR = 6.8 vs retired/housewives), living in 1-2 room public housing (OR = 8.0 vs living in 5 room public housing or private housing), higher post-secondary educational level (OR = 4.7 vs no formal education), and having 3 or more medical comorbidities (OR = 18.4 vs having no medical comorbidities). Depression was not associated with gender, marital status or religion.

Conclusion: Important socio-economic and psychosocial factors and having medical conditions are associated with depression in older adults in Singapore. These information used in directing policy and planning of elderly health and social services may reduce morbidity and burdens and cost of care.

I050/MPC**Prognostic Factors in Patients with Acute Myeloid Leukaemias and High-Grade Myelodysplastic Syndromes – A Single Institution Evaluation**LG LAU¹, WJ CHNG¹, MY NORAINOON¹, KH ONG², LK TAN³, BMF MOW¹, YK KUEH⁴¹Department of Haematology-Oncology, National University Hospital, Singapore, ²Department of Laboratory Medicine, Tan Tock Seng Hospital, Singapore, ³Department of Laboratory Medicine, National University Hospital, Singapore, ⁴Department of Medicine, National University Hospital, Singapore

Aim: To identify and evaluate prognostic factors that influence overall (OS) and disease-free survival (DFS) in patients with myeloid malignancies.

Methods: A retrospective clinical and histo-cytogenetic-molecular data review of all newly-diagnosed patients with myeloid malignancies at the National University Hospital from 2000 to 2003.

Results: A total of 93 patients were identified (median age: 55 years). The breakdown of the subtypes of myeloid malignancies is: RAEB 11.8%, RAEB-T 4.3%, M0 3.2%, M1 8.6%, M2 24.7%, M3 10.8%, M4 16.1%, M5 9.7%, M6 6.5%, M7 2.2% and biphenotypic 2.2%. With median follow-up of 6 months (range 0.1-49.3), 16.1% were lost to follow-up, 59.1% had died and 24.7% were alive. The median OS and DFS were 5.2 months and 9.3 months respectively. In univariate analysis, age, presenting white cell count (TWC), FAB M3 morphology, LDH levels, cytogenetics, and response to first induction chemotherapy were identified as prognostic factors for both DFS and OS. In addition, response to induction and stem cell transplantation (SCT) were also prognostic factors for OS. In multivariate analysis, presenting TWC, LDH levels, antecedent haematologic disease, response to induction and SCT were significant prognostic factors for OS while presenting TWC, cytogenetics and FLT3 mutation were significant for DFS.

Conclusion: Prognostic factors for a cohort of local patients with myeloid malignancies were identified in this retrospective study. These should be validated in on-going analysis and, eventually, incorporated into management planning algorithm for patients with newly-diagnosed myeloid malignancies.

I051/MPC**Novel CYP2C9 Genetic Variants in Asians and Their Influence on Maintenance Warfarin Dose**SC RANKIN¹, F ZHAO¹, C LOKE², HB KHOR¹, JY GUO¹, HS LEE³, TS WU², T TAN⁴, TC LIU¹, YT LIM⁵, YM WONG⁶, A WONG⁷, KS NG⁸, BC GOH¹, SC LEE¹¹Department of Haematology-Oncology, National University Hospital, Singapore, ²Department of Pharmacy, National University Hospital, Singapore, ³Department of Pharmacology, National University of Singapore, Singapore, ⁴Department of Biochemistry, National University of Singapore, Singapore, ⁵Department of Cardiology, National University Hospital, Singapore, ⁶Department of Pharmacy, Tan Tock Seng Hospital, Singapore, ⁷Department of Haematology-Oncology, Tan Tock Seng Hospital, Singapore, ⁸Department of Cardiology, Tan Tock Seng Hospital, Singapore

Aim: Commonly occurring genetic variants in CYP2C9 are associated with enhanced patient sensitivity to warfarin. Inter-ethnic differences in warfarin dose requirement have been described in Asians, and we postulate that this could be related to genetic variants of CYP2C9 that are unique to ethnic groups.

Methods: We prospectively genotyped patients who were receiving a stable daily warfarin dose to maintain International Normalised Ratio (INR) between 2-3 through comprehensive sequencing of the promoter and coding regions of CYP2C9.

Results: The mean weight-adjusted warfarin maintenance dose was significantly lower for Malays and Chinese than Indians ($p < 0.001$, 374G>A, 485C>A, 895A>G, 1144C>T, 1190A>C and 1362G>C). CYP2C9*3 but not CYP2C9*2 was found in Chinese and Malay patients, and carriers of the CYP2C9*3 variant in Chinese ($P < 0.01$) and Indians ($P < 0.01$) but not Malays ($P = 0.77$) required less warfarin. The influence of the novel exonic variants on warfarin dose requirement was unclear as they were rare, but the lower warfarin dose requirement for Chinese and Malays existed despite omitting individuals with any coding region variants from analysis. This study is ongoing, with over 200 patients enrolled and 125 patients genotyped. More data will be available at the congress.

Conclusion: Inter-ethnic differences in warfarin dosing in Asians may be due to other genetic, dietary or environmental influences; however, these novel genetic variants warrant further characterisation through functional studies.

I052/MPC**Clinical Genetic Counselling and Genetic Testing for Hereditary Breast Cancer in Singapore**WS CHIENG¹, SC LEE¹, P IAU², R YIP³¹Department of Haematology-Oncology, National University Hospital, Singapore, ²Department of Surgery, National University Hospital, Singapore, ³Administration, National Healthcare Group HQ, Singapore

Aim: A Cancer Genetics Clinic that manages hereditary cancers has been established in the National University Hospital since 2001.

Methods: We report the clinical profile of women with breast cancer evaluated in this clinic.

Results: 114/128 (89%) patients evaluated were high-risk with at least 10% chance of carrying a BRCA1/2 mutation, and were offered genetic counselling and testing. The majority were Chinese (73%), median age was 38 (range 25-83) years. 78% were married, 50% had children. 63/114 (55%) had young breast cancer, below age 40, with no family history of breast or ovarian cancer, 42/114 (37%) had at least 1 first- or second-degree relative with breast cancer. 9/114 (8%) had family history of breast and ovarian cancer. 20/114 (18%) undertook genetic testing, of which 8/20 (40%) and 3/20 (15%) had a deleterious mutation or missense mutation of uncertain significance respectively. Predictive testing for cancer-free family members is underway to identify high-risk subjects for screening. Cost was a major barrier to testing: only 4/82 (5%) women were tested at S\$4500 prior to availability of government subsidy; the majority tested after September 2003, with a government grant that provided 100% subsidy to women with at least 30% probability of carrying a mutation, whereupon 16/32 (50%) eligible patients undertook testing.

Conclusion: BRCA1/2 families in Singapore may be identified through genetic testing. Governmental efforts to overcome cost barriers are instrumental to optimise use of this specialised service to identify high-risk subjects for screening to reduce cancer burden.

I053/MPC

Clinical Spectrum of Severe Acute Respiratory Syndrome in Exposed Healthcare Workers

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Aim: The nosocomial outbreak of severe acute respiratory syndrome (SARS) in Singapore began in early March 2003 at Tan Tock Seng Hospital (TTSH), at a time when SARS was not recognised and no infection control measures were in place. We assessed the clinical spectrum of SARS coronavirus infection in exposed healthcare workers (HCW).

Methods: We did a seroepidemiological study amongst all HCW exposed to the first 3 SARS cases at TTSH in the first month of the outbreak. HCW completed a detailed questionnaire on duration and type of exposure to SARS patients and provided blood samples. ELISA for SARS coronavirus, and quantitative antibody titres were performed, with the laboratory personnel blinded to clinical data.

Results: Of 99 exposed HCW, 81 consented to participate. 45 (55.6%) cases were SARS serology positive. Of the 45 SARS positive cases, 38 (84%) had pneumonic changes, 3 (6%) had fever and respiratory symptoms but no pneumonia, 2 (4%) were totally asymptomatic and another 2 (4%) had no respiratory symptoms or fever, but had diarrhoea. The titres for SARS antibodies was significantly higher in probable SARS cases versus asymptomatic cases. On univariate analysis, there was no difference in the duration and type of exposure to the source cases between pneumonic SARS cases and asymptomatic SARS serology positive cases.

Conclusion: The presence of asymptomatic SARS cases concurs with findings from Hong Kong, and may explain cases of SARS-CoV pneumonia who had no obvious contact with other patients with SARS.

I054/MPC

MRSA and SARS

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Aim: To examine the effect on MRSA rates of workflow changes, isolation policies and infection control precautions during SARS.

Methods: Known MRSA patients were taken out of isolation rooms and placed in general wards as priority for isolation rooms was given to patients

who required airborne precautions. Work practices were changed: patients were examined by fewer doctors during rounds, and case notes kept away from patients' bed-side. Compliance to hand hygiene was excellent because of fear of getting SARS.

Results: Though the total number of MRSA cases fell during the second quarter when there were SARS patients in TTSH, the rate per 1000 patient-days was paradoxically increased because of a reduction in the denominator. The trend was similar when the denominator was 1000 deaths/discharges. The increase corresponded to an increase in the length of stay. Both rates returned to pre-SARS levels after the hospital resumed normal admissions and the average length of stay returned to baseline.

Conclusion: Prolonged length of stay plus placing of MRSA patients in general wards contributed to increased MRSA rates despite heightened infection control awareness during SARS.

I055/MPC

Factors Affecting Outcome in Diabetic Peritoneal Dialysis (PD) Patients

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Aim: Diabetic end-stage renal failure (ESRF) patients generally have a poorer outcome than those without diabetes mellitus (DM). Our study was aimed at defining factors that was associated with poor outcome in the diabetic PD population.

Methods: This retrospective study included all patients who started PD in 2002 to March 2003. All analyses were done comparing diabetic PD patients with those that did not have DM. We chose 4 parameters (age, serum albumin, haemoglobin and C reactive protein) that have been reported in other studies to affect survival.

Results: A total of 53 diabetic and 25 non-diabetic PD patients were included in the study. The mean follow-up time was 17.2 ± 6.8 months. The mean (±SD) survival for the diabetic PD patients was 16.9 ± 7.1 months as compared to the 17.7 ± 6.4 months for those without DM. Diabetic PD patients had lower serum albumin ($P = 0.019$) and higher C reactive protein ($P = 0.014$) compared to the non-diabetic PD patients. The diabetic PD patients were not older ($P = 0.258$) and did not have significantly different haemoglobin ($P = 0.897$). A higher C reactive protein was also significantly associated with lower serum albumin in the diabetic as well as the overall population. A higher C reactive protein and lower serum albumin were both independent predictors of survival in diabetic PD patients.

Conclusion: Diabetic PD patients have lower serum albumin and higher C reactive protein. It may be the combination of these 2 factors (inflammation-malnutrition syndrome) that adversely affects the outcome of the diabetic PD population.

I056/MPC

Survival on Peritoneal Dialysis is Adversely Associated with Serum Albumin

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Aim: Peritoneal dialysis (PD) is commonly practiced in Singapore. As in haemodialysis, survival on PD can be influenced by many factors including nutritional status. The aim of our study was to correlate survival on PD with serum albumin (as a surrogate marker for nutrition) at incident of dialysis.

Methods: This retrospective study included all patients who started PD in 2002 to March 2003. Incident biochemical markers were defined as the parameters that were taken at 3 months after starting PD. Survival on PD was analysed along 2 distinct groups of serum albumin. Group I had serum albumin <33g/L and Group II had serum albumin ≥33g/L.

Results: A total of 78 patients were included (53.8% females). The mean age (±SD) was 64.1 ± 12.6 years, with 67.9% diabetics. Lower serum albumin was associated with lower haemoglobin ($P = 0.012$), and higher C reactive protein (CRP) ($P = 0.024$). It was not associated with patients' age. There were 40 patients (51%) in Group I and 38 patients (48%) in Group II. Serum albumin at incident predicted survival on this PD population ($P = 0.0023$). This association was not changed when adjusted for haemoglobin, CRP, or age.

Conclusion: Serum albumin at incident is a predictor of poor outcome on PD.

This supports the need to have intensive nutritional intervention even in the pre-end stage renal failure stage.

I057/MPC

Impact of Glycaemic Control on Glomerular Filtration Rate (GFR) Changes Across Different Stages of Chronic Kidney Disease (CKD) in Patients with Diabetic Nephropathy

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Aim: To determine whether reduction in HbA1c will retard the progression of diabetic nephropathy in poorly glycaemic controlled patients at different stages of CKD classified by National Kidney Foundation K/DOQI guidelines.

Methods: Data from 51 diabetic nephropathy patients with HbA1c $\geq 8\%$ were analysed retrospectively from September 2003 to April 2004. Thirty-five patients with significant reduction in HbA1c were selected. GFR at baseline and at the end of follow-up were calculated by MDRD formula. The patients were stratified into 5 stages of CKD. The stages were GFR >90 (n = 2), 60-89 (n = 9), 30-59 (n = 14), 15-29 (n = 9) and <15 (n=1) ml/min/1.73m². One patient in stage 5 was excluded.

Results: Mean age of patients in stage 1 to 4 of CKD was 47.5 ± 2.1 , 56.4 ± 7.7 , 61.2 ± 8.1 and 63.6 ± 4.0 years. The means of HbA1c reduction were 1.9, 2.0, 1.7 and 2.5 respectively. Average reduction in GFR in stage 2 and stage 3 were 15.5 ($P = 0.03$) and 6.4 ($P = 0.001$) ml/min/1.73m². The rates of GFR reduction were 22% ($P = 0.033$) and 17% ($P = 0.000$). However, patients in stage 4 did not seem to have significant decrease in GFR that is probably due to lower baseline nephron mass.

Conclusion: The rates of decline in GFR were significant in patients with poor glycaemic control. Interestingly, the rates of decline were faster in patients with stage 2 and 3 CKD despite improvement in glycaemic control. Further studies with larger sample size and other related factors are warranted.

I058/MPC

Impact of Intensive Multi-disciplinary Approach on Reduction of HbA1c in Diabetic Nephropathy Patients

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Aim: To evaluate the impact of intensive multi-disciplinary approach on reduction of HbA1c in diabetic nephropathy patients with poor glycaemic control.

Methods: Fifty-one patients (49% male; 67% Chinese, mean age 60 ± 8.25 years) with diabetic nephropathy and HbA1c $\geq 8\%$ were studied prospectively from 1 September 2003 to 31 March 2004. All patients were followed up intensively by physicians (between 2-5 visits) to have medications (oral hypoglycaemic agents and/or insulin) adjusted, compliance evaluated and diabetic-related complications assessed. Patients were seen by dietitians at least 2 visits for dietary counselling and lifestyle modification. Social and financial issues were assessed and followed up by medical social workers. The patients' progress was monitored by registered nurses. Blood pressure, HbA1c, renal function and proteinuria were measured periodically.

Results: Thirty-five patients (68.6%) had significant reduction in HbA1c after 6 months of intensive multi-disciplinary approach. HbA1c was unchanged in 2 patients. Mean HbA1c at baseline and post intervention in patients with improved glycaemic control were 10.5% and 8.6% respectively ($P \leq 7\%$). Among 51 patients, the baseline and latest mean HbA1c were 10.4% and 9.8% respectively ($P > 0.05$). There were no differences in gender, ethnicity and anti-diabetic medications used in 51 patients.

Conclusion: Intensive multi-disciplinary approach had significant impact on reduction of HbA1c in diabetic nephropathy patients with poor glycaemic control. To achieve and maintain optimal HbA1c ($\leq 7\%$) is challenging. Multi-level task and co-operation among healthcare professionals and patients must be enforced.

I059/MPC

Effect of Handphone Use on the Mechanical Ventilator in ICU

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Aim: A recent report highlighted that a handphone may interfere with the performance of the mechanical ventilator (MV), especially if it does not have proper electromagnetic shielding. As the handphone tested is not used in Singapore, we decided to test common local handphones on the 1800 Hz frequency network.

Methods: The PB840 (Tyco) MV was set up at an empty ICU cubicle ventilating a test lung. Set distances (0 cm, 30 cm, 50 cm, and 100 cm) from the ventilator were marked and a height of 100 cm was used to place the handphones tested. The handphones were allowed to ring for 5 rings and then the call was accepted. A total of 7 handphones were used (5 different Nokia models: 6610, 6600, 8310, 6230, 3100; 1 Samsung S500; 1 Panasonic 6D88).

Results: When the handphones rang, the changes seen were increases in respiratory rate, and increases in tidal volumes. These were seen with all handphones at 0 cm from the ventilator. The Nokia 6600 and Samsung S500 did not affect the ventilator unless they were placed at 30 cm or less from the ventilator. Only 2 handphones caused changes at 100 cm (Nokia 6230 and the Panasonic 6D88). There were no shutdowns.

Conclusion: Handphones that are ringing may influence the performance of the PB840 MV if placed less than 100 cm from the ventilator. Adequate electromagnetic shielding for these devices should be considered if handphones are to be used in the ICU setting.

I060/MPC

Angiotensin Receptor Antagonist (ARB) Versus Angiotensin Converting Enzyme (ACE) Inhibitor in Asian Subjects with Type 2 Diabetes and Albuminuria – A Randomised Cross Over Study

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Aim: Subjects with type 2 diabetes mellitus (T2DM) and albuminuria are at risk for progressive diabetic nephropathy (DN). No randomised controlled trial has been performed to directly compare the antiproteinuric efficacy of ARB vs ACE inhibitor

Methods: Forty ARB- and ACEI-naive T2DM subjects with albuminuria (>30 mg/g creatinine) were given either 50 mg of Losartan (L) (ARB) or 20 mg of Quinapril (Q) (ACE inhibitor) (50% maximum dose) for 4 weeks with 4 weeks wash-out period in-between interventions in a cross over fashion. The order of intervention was randomised. The primary endpoint was reduction of albuminuria

Results: Among the 40 subjects, 62% were Chinese, 33% Malays and 5% Indians; 67% were male. The mean age (SD) was 54(10) years, BMI 27.1(4.6) kgm⁻², waist 92(13) cm, baseline systolic BP (SBP) 135(15) mmHg, diastolic BP (DBP) 83(9) mmHg, FPG 9.3(2.7) mM, HbA1c 8.3(1.8)%, serum potassium 4.2(0.4) mM, serum creatinine 76.4(17.9) μ M, urinary albumin/creatinine ratio (ACR) 445 (978) mg/g. Blood pressure reduction on both interventions was similar [SBP: L 3(14) vs Q 2(12) mmHg, $P = 0.65$; DBP: L 1(9) vs Q 2(8) mmHg, $P = 0.66$]. However, amelioration of albuminuria was significantly greater with Losartan [L vs Q: -367 (973) vs -21 (318) mg/g, $P = 0.01$].

Conclusion: In Asian subjects with T2DM and albuminuria, 50 mg of Losartan appears to have greater antiproteinuric effect than 20 mg of Quinapril in spite of comparable reduction in blood pressure.

I061/MPC

The Relationship Between NCEP Defined Metabolic Syndrome and Albuminuria in Asians

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Aim: Little is known on whether Asian subjects with NCEP defined metabolic syndrome are also associated with albuminuria.

Methods: We studied the relationship between NCEP-defined metabolic syndrome and albuminuria in 616 Asian healthcare workers. Elevated waist circumference was defined as male ≥ 90 cm and female ≥ 80 cm. Albuminuria was defined as spot urinary albumin over creatinine ratio ≥ 30 mcg/mg. A factor of 0.68 was used to adjust for gender differences in urinary creatinine excretion.

Results: 58% were Chinese (C), 25% Malays (M) and 17% Indians (I); 71% were females. The mean age (\pm SD) was 38 ± 12 years, BMI 24.1 ± 4.6 kgm⁻², waist 73 ± 17 cm, systolic BP (SBP) 119 ± 15 mm Hg, diastolic BP (DBP) 76 ± 10 mm Hg, FPG 5.3 ± 1.4 mM. Median urinary albumin/creatinine ratio (ACR) was 8.8 mcg/mg (95% CI 5-96). Only 6.7% of the participants met the NCEP criteria for the diagnosis of metabolic syndrome. Subjects with the metabolic syndrome are older (43 ± 12 vs 37 ± 11 years; $P < 0.001$) and more likely to be of Indian ethnicity (I vs M & C: 12.4% vs 6.6% & 5.0%; $P = 0.03$). The proportion of albuminuric subjects among individuals with and without the metabolic syndrome differed significantly (30 vs. 12% respectively, $P = 0.005$). Using logistic regression with adjustment for differences in age, presence of the metabolic syndrome was associated with an increased likelihood of albuminuria (odds ratio 1.57, 95% CI 1.23-2.69; $P = 0.048$).

Conclusion: Asian subjects with NCEP defined metabolic syndrome are also at increased risk for albuminuria.

I062/MPC

The Non-hydropic "Bart's Hydrops" (homozygous alpha-0 thalassaemia)

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Aim: Most fetuses with homozygous alpha-0 thalassaemia are diagnosed in-utero and the pregnancies terminated. A non-hydropic presentation in pregnancy and newborn period is a rare occurrence and may result in delayed diagnosis. We report such a case.

Methods: The baby and his mother's case records were retrospectively analysed. A literature search on atypical presentations of Bart's Hydrops was performed.

Results: A Chinese woman with oligohydramnios and a growth-retarded fetus underwent elective caesarean section at 35 weeks gestation. Her antenatal haemoglobin level was 10.5 g/dL but a Mean Corpuscular Volume (MCV) was not determined. The male infant had an Apgar score of 6 at 5 minutes. He had pallor, hepatomegaly, hypospadias, undescended testes, weighed 1991 g (3rd centile) and was not hydropic. Despite intensive cardiorespiratory support for presumed Persistent Pulmonary Hypertension of Newborn, he remained hypoxic and acidotic. His low haemoglobin level (11.8 g/dL), low MCV (102 fL), marked anisopoikilocytosis and nucleated red blood cells on the peripheral blood film suggested the possibility of a haemoglobinopathy. Both parents had low MCV values (mother 68 fL, father 70 fL). The baby's haemoglobin electrophoresis showed presence of only Haemoglobin Bart's, Haemoglobin H and embryonic haemoglobins confirming the diagnosis of Bart's Hydrops. Literature search confirmed the association of genitourinary abnormalities with Bart's Hydrops and offered possible pathophysiological reasons for a non-hydropic presentation.

Conclusion: Alpha thalassaemia carriers need not be anaemic during pregnancy and fetuses with Bart's Hydrops need not be hydropic. The value of the MCV in identifying carriers and affected cases is demonstrated.

I063/MPC

Newborn Hearing Screening – Improving Programme Performance

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Aim: In 1999, the National University Hospital introduced Newborn Hearing Screening using a single stage strategy of measuring transient evoked otoacoustic emissions (TEOAE). The aim of this study was to measure the improvement to the programme performance resulting from the introduction of a second stage where automated brain stem responses (AABR) are measured.

Methods: Babies are screened within 24 hours of birth using an automated OAE screener. Those with poor responses are rescreened with a semi-automated AABR. Those showing poor responses again are rescreened as outpatients at about 6 weeks' of age. Those not meeting the pass criteria are classified as having been screened positive and are referred to ENT for diagnostic studies.

Results: From April 2003 to March 2004, 2283 (99.6%) of newborns were screened and the 14 who tested positive were referred for diagnostic evaluation. Thirteen were confirmed to have hearing loss, giving an incidence of 5.7/1000 newborns. The incidence of severe/profound hearing loss was 0.88 per 1000 newborns. The specificity and positive predictive value were 99.9 and 93%. With the original single stage strategy, the specificity was 93% and the PPV 2.6%.

Conclusion: The introduction of a second stage of screening by an AABR evaluation has produced a marked improvement in specificity and PPV. This will enhance the acceptability of the screening programme and specifically reduce the inconvenience, costs and anxiety that are consequent to a referral for diagnostic evaluation.

I064/MPC

Current Pattern of Hyperbilirubinaemia in Glucose-6-Phosphate Deficient (G6PD) Male Newborns Diagnosed by Newborn Screening and Hospitalised from Birth

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Aim: G6PD deficient newborns are currently electively hospitalised for 7 days after birth to prevent kernicterus. The aim of this study is to determine the pattern of hyperbilirubinaemia in a recent cohort.

Methods: A retrospective study was performed on G6PD deficient male babies born in the National University Hospital, Singapore between January 1998 and July 2003. Case records were traced for demographic data, serum bilirubin results, incidence and timing of phototherapy and duration of hospitalisation.

Results: There were 146 cases during this 5½-year period. The median duration of hospitalisation was 7 days. Eighteen infants had serum bilirubin levels exceeding 255 µmol/L, but none had levels exceeding 340 µmol/L. Fifty-four infants (37%) underwent phototherapy; 62% of them received phototherapy within the first 72 hours of life, 18% between 72 and 96 hours of life and the remaining 10 babies between 97 and 144 hours of life. Only 2 infants needed re-admission for phototherapy in their second week of life. No case developed kernicterus.

Conclusion: The current strategy of a 1 week elective hospitalisation has proven to be effective in preventing kernicterus. Significant hyperbilirubinaemia in G6PD deficient neonates is mostly in the first 4 days of life. However, we speculate that a 4-day hospitalisation strategy in the absence of clinical risk factors, followed by outpatient surveillance will prove to be as effective.

I065/MPC

Family-Centred Neonatal Intensive Care – Parental Perceptions

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Aim: Contemporary newborn intensive care requires significant participation by parents. Parents traditionally see themselves only as visitors of their baby. The aim of this study was to determine the path leading to the practice of family-centred care.

Methods: A 31-statement questionnaire that addressed parental perceptions of ward practices, health personnel and physical environment of the nursery was administered to 36 sets of parents whose babies were discharged alive from the Neonatal Intensive Care Unit (NICU) between August 2003 and

January 2004. Their responses were scored on a 5-point Likert Scale ranging from Strongly Agree, Agree, Not Sure, Disagree and Strongly Disagree.

Results: Twenty-four parents responded. Their role in decision-making (3.04) and awareness of the doctor-in-charge (3.37) were poorly rated. They clearly preferred more involvement in care activities; e.g. being with their baby during procedures (3.8-3.9) and ward rounds (4.46). Private and more comfortable resting and visiting space was also needed (3.87, 3.62). The nursery was found to be not noisy, bright or anxiety-provoking (2.42, 2.50, 2.71). Rated highly were the knowledge and approachability of the doctors (4.17, 4.08) and nurses (3.71, 4.00).

Conclusion: We have identified areas for improvement in order to achieve family-centred care in the NICU. Physical improvement has begun with the creation of a family room for rest and private communication with health personnel. The results of this study will be shared with other staff members to enrol them in the process of facilitating parental participation in care and identifying the baby's primary physician.

I066/MPC

Traumatic Extradural Haematoma of the Posterior Fossa in Children – Report of 13 Cases

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Aim: Traumatic posterior fossa extradural haematomas (TPFEDH) in children are reported to be relatively uncommon. However, our clinical impression is that they occur fairly frequently. Our aim is to study the clinical presentation and outcomes of children with this type of head injury admitted to our institution.

Methods: Case record and surgical record review of children with this condition admitted to our institution from 1998 to 2003.

Results: Thirteen children with traumatic posterior fossa extradural haematoma were identified. All had a history of mild to moderate blunt trauma to the occiput. The cause of injury in the majority was due to falls. Most of the cases (72%) occurred in young children aged from a few months to 6 years. The clinical presentation was mainly headache, vomiting, and decreasing level of consciousness. The haematomas were diagnosed on CT scanning and all cases underwent surgical intervention. The postoperative outcome in all was good.

Conclusion: Traumatic extradural haematoma of the posterior fossa in children is not uncommon and occurs as a result of a blunt head trauma. Initial loss of consciousness is uncommon and symptoms develop slowly. Most patients presented with high GCS scores. Persistent mild headache, vomiting, and parents' sense of their child's "unusual behaviour" warrants a head CT scan to exclude the diagnosis. Surgery for TPFEDH is safe and the outcome is excellent.

I067/MPC

Traumatic Haematuria Presentation of Congenital Pelviureteric Obstruction

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Aim: Gross haematuria in a paediatric patient following seemingly trivial trauma should arouse the suspicion of a pre-existing abnormality.

Methods: We report a 14-year-old girl with previously asymptomatic and undetected pelvi-ureteric obstruction who first presented with gross haematuria following a minor fall. The diagnosis was established during the index admission by an abdominal CT scan. Our initial treatment was non-operative to allow healing of the laceration and subsequently quantify the renal function and obstruction by follow-up ultrasound and isotope renal scan. Definitive surgical treatment of the PUJ obstruction was achieved by a dismembered (Anderson-Hynes) pyeloplasty.

Results: On follow-up at 6 months, the blood pressure and renal function are normal. A repeat renal scan is planned.

Conclusion: Gross haematuria is an important indicator of severe urinary tract injury. Haematuria following apparently minor trauma should alert the physician to the possibility of a pre-existing abnormality. The presence of incidental genitourinary anomalies in paediatric renal trauma does not seem

to have an impact on recovery from the injury itself. CT scan is recommended as the initial imaging. The management is first directed towards the treatment of the injury. Once the injury heals then the surgical treatment of the abnormality follows standard guidelines. The long-term prognosis is good.

I068/MPC

Anterior Urethral Valves

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Aim: We studied the clinical presentation and management of 4 patients with anterior urethral valves; a rare cause of urethral obstruction in male children.

Methods: One patient was antenatally diagnosed with oligohydramnios, bilateral hydronephrosis and bladder thickening. Two patients presented at 1 and 2 years' of age with poor stream of urine since birth. The oldest patient presented at 9 years with frequency and dysuria only. Diagnosis was established on VCUG (voiding cystourethrogram). All patients had cystoscopic ablation of the valves. One patient had repeated attempts at cystoscopic ablation; he developed a postablation stricture and an open urethroplasty was performed. A bilateral VUJ obstruction was also simultaneously treated by a bilateral ureteric reimplantation.

Results: On long-term follow-up all patients demonstrate a good stream of urine. The renal function is normal. There is mild residual upper tract dilatation in 1 patient who was detected antenatally. Patients are continent and free of urinary infections.

Conclusion: Anterior urethral valves are rare obstructive lesions in male children. The presentation can vary. A severe obstruction would result in antenatal hydronephrosis and renal impairment whereas a lesser grade may present postnatally with mild micturition difficulty. Hence, it is important to routinely evaluate the anterior urethra in any male child with suspected infravesical obstruction. The diagnosis is established by a VCUG and the treatment is always surgical; either a cystoscopic ablation or open resection with urethroplasty depending on the adequacy of urethral support and presence of stricture. The long-term prognosis is usually good.

I069/MPC

Congenital Branchial Cleft Derivative Presenting as an Intrathyroid Abscess

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Aim: The thyroid gland is extremely resistant to acute bacterial infection. Hence the occurrence of such an infection should alert the physician to an underlying pyriform sinus fistula.

Methods: We report a case of an intrathyroid abscess in a 5-year-old boy who presented with a tender thyroid nodule that was resistant to antibiotics. Suspicion of a communication with the oral cavity arose when actinomyces was identified within the fine needle aspirate. A persistent pyriform sinus fistula was confirmed on a barium swallow.

Results: Incision and drainage was not performed. Instead a planned thyroid nodulectomy with excision of the fistulous tract in continuity was performed with perioperative penicillin cover. The penicillin was continued for 6 months.

Conclusion: The most important principles in the management of pyriform sinus fistula are high index of suspicion when presented with a thyroid abscess and complete surgical excision of the entire tract along with the involved thyroid.

I070/MPC

Retroperitoneal Inflammatory Myofibroblastic Tumour

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Aim: Formerly known as inflammatory pseudotumour or plasma cell granuloma, inflammatory myofibroblastic tumour is a distinctive tumour of proliferating myofibroblasts with a background inflammatory infiltrate and low malignant potential.

Methods: A previously well 12-year-old boy presented with fever, right-sided flank pain and loss of weight of 1-month duration. The ESR was raised;

but the white cell count was normal. An abdominal CT scan revealed a right suprarenal mass measuring 3.5 cm without any calcification. He underwent a laparotomy with complete excision of the tumour. Histology revealed an inflammatory myofibroblastic tumour of the retroperitoneum invading the adrenal without any correlates of aggressive behaviour.

Results: The recovery was smooth. Postoperatively, the ESR normalised. No further treatment was given due to the benign nature of the tumour. A follow-up of 6 months did not reveal any recurrence.

Conclusion: Inflammatory myofibroblastic tumour is usually benign with the potential for local recurrence and occasional metastases. Optimal treatment is complete surgical excision.

I071/MPC

Factors in Gastroenteritis Affecting the Duration of Hospitalisation

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Aim: To audit management practices in children hospitalised for gastroenteritis, in particular: investigations performed, mode of hydration, medication usage and the average length of stay (ALOS).

Methods: A retrospective case series of children (1 month to 18 years old) admitted to the National University Hospital for gastroenteritis between 1 January and 31 December 2002 was done. Cases were identified from the hospital database using ICD-9CM coding for gastroenteritis. Logistic regression was used to ascertain the factors influencing hospitalisation greater than 3 days.

Results: 705 inpatient records were analysed. The mean age was 5.0 years + 2.0 years. Admissions occurred at the average of 2.4 days after the onset of symptoms. The main reasons for admission were clinical dehydration (64%), decreased feeding (16%) and abdominal pain (10%). FBC and U&E were done in 90.4% and only 16% had abnormalities. 88% did not receive oral rehydration prior to admission. 83% required intravenous hydration and only 27% were given oral rehydration during the admission. The ALOS was 2.9 days + 3.0 days, with 20% staying longer than 3 days. Logistic regression identified that use of antibiotic and frequent diarrhoea prior to admission, inability to retain feeds, duration on intravenous drip and co-existence of comorbid conditions were independently associated with an ALOS greater than 3 days. The most significant factor was duration of IV hydration (OR = 4.3, 95% CI 3.2-5.8).

Conclusion: To reduce the ALOS, clinicians should consider reducing the duration of intravenous hydration by using more oral rehydration.

I072/MPC

Our Perception and Understanding of Pain in Neonates

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Aim: To determine the perception and knowledge of the house staff (doctors and nurses) with regards to pain in the neonates and to determine their feelings about their role in relieving the neonates' pain.

Methods: A cross-sectional survey was conducted in May 2004. Doctors and nurses of the Neonatal Intensive Care Unit (NICU) were recruited. Information concerning the perception, myths, attitudes and ethics of pain in neonates were obtained using a self-administered questionnaire.

Results: A total of 40 house staff, including nurses, healthcare assistants and doctors were recruited. All of them believe that babies can feel pain. Fifteen (37.5%) think that babies can remember pain. All agreed that doctors and nurses have a responsibility to relieve the neonates' pain. They also feel that the care of the infants in NICU can be improved by implementing good pain management. Only 8 (20%) feel that it will inconvenience them if a pain protocol is implemented, reasons being that it may cause parents/staff conflicts, complications in patient, less attention for the sicker babies and delay in treatment of emergencies.

Conclusion: Most of the staff nursing the babies are aware that babies feel pain and would like to be actively involved in managing the newborns' pain. Only a handful of staff feels that it is inconvenient. It is our goal that with better education, identifying pain will become part of the physical examination and managing it, a part of holistic care for the little ones.

I073/MPC

Quality of Life Before and After Tonsillectomy-Adenoidectomy in Nocturnal Polysomnography Proven Childhood Obstructive Sleep Apnoea

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Aim: The aim was to determine the quality of life (QOL) before and after surgery in nocturnal polysomnography proven childhood obstructive sleep apnoea (OSA).

Methods: The validated QOL survey of paediatric OSA, the OSA-18 form, was used in childhood OSA proven by nocturnal polysomnography and who received tonsillectomy with/without adenoidectomy. Cases with underlying craniofacial, metabolic or other abnormalities were excluded.

Results: There were 16 children (median age 6.3 years, range 3.9-15.4 years). The median obstructive apnea index (OAI) was 2.6/H (range 1.0-16.7/H). In 15% of children, OSA had a small impact; in 39% it had a moderate impact, and in 46% it had a large impact on QOL. There were highly significant improvements in global QOL and in most QOL domains (sleep disturbance, physical symptoms, daytime function and caregiver concerns); after curative surgery for OSA. Improvements were largest in the domains of sleep disturbance and caregiver concerns. The OSA-18 severity score (total score) was not related to pre-operative OAI ($r = 0.05$, $P = 0.88$) or BMI ($r = 0.24$, $P = 0.48$). The change score was also not related to pre-operative OAI ($r = 0.06$, $P = 0.86$) or BMI ($r = -0.30$, $P = 0.38$).

Conclusion: There was a moderate to large impact on QOL in 85% of children with nocturnal polysomnography proven OSA. There were highly significant improvements in global QOL and in most QOL domains; after curative surgery for OSA.

I074/MPC

Psychological Distress and Coping in Patients Following Recovery From SARS

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Aim: The physical illness resulting from severe acute respiratory syndrome (SARS) has been a subject of interest and research. Although less attention has been given to the psychological suffering during SARS illness, clinical evaluation suggested a significant level of psychological distress. The aim of this study was to profile the pattern and severity of psychological distress and associated coping strategies, in patients following recovery from SARS.

Methods: One hundred and fifty-four eligible patients were sent questionnaires by post. These included the Hospital Anxiety and Depression Scale, Impact of Event Scale, General Health Questionnaire 12 and COPE questionnaire. We used multiple regression analysis to ascertain the relationship between different coping strategies used and the levels of psychological distress perceived.

Results: We received a response rate of 39.6%. 14.8% and 18.0% of subjects reported at least moderate depressive and anxiety symptoms. 51.7% suffered from moderate post-traumatic stress symptoms. Significant psychological distress, as measured by the GHQ-12, was present in 38.3% of respondents. Patients reported using higher levels of "emotion-focused" coping than "problem-focused" coping strategies. The 3 most commonly used strategies were "Acceptance", "Positive Reinterpretation and Growth" and "Turning to Religion". Greater use of "restraint coping" and "focusing on and venting emotions" was also associated with poorer psychological distress outcomes.

Conclusion: Psychological Distress exists in SARS survivors. These included symptoms of Depression, Anxiety and Post-Traumatic Stress. The use of certain coping strategies was associated with poorer outcome.

I075/MPC**Quality of Life in Schizophrenia: WHOQOL-100 Versus SF-36**
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Aim: Quality of life (QOL) is a critical outcome indicator in healthcare, for which measurement is disease and culture-dependent. The WHOQOL-100 and Medical Outcome Short Form-36 (SF-36) are 2 commonly used self-report QOL scales. We aimed to compare these 2 scales against clinician assessment of psychopathology to ascertain their validity in local patients with schizophrenia.

Methods: Fifty stabilised patients with schizophrenia and 50 normal controls were assessed using the WHOQOL-100 and SF-36. Patients were also rated on the positive and negative symptom scale (PANSS).

Results: Both the WHOQOL-100 and SF-36 showed high internal consistency (Cronbach alpha = 0.89 and 0.88 respectively). The domains of the 2 QOL questionnaires, except the social domain, showed significant inter-correlations in both patients and control groups. The WHOQOL-100 domains correlated with PANSS positive, negative and general symptoms, while SF-36 domains correlated only with PANSS depression scores. The domains of both scales, except the WHOQOL-100 spiritual domain, were able to discriminate between patients and controls. Within the patient group, WHOQOL-100 domains differed between those with higher and lower negative symptom and depression scores, while SF-36 domains differed only in patients with higher and lower depression scores.

Conclusion: While both the WHOQOL-100 and SF-36 are valid assessments of QOL in local schizophrenia patients, the WHOQOL-100 appears to better reflect the effect of schizophrenia psychopathology.

I076/MPC**Does Result Presentation Influence Physician Interpretation of Published Research? – Analysis of the Primer 1 Randomised Study**

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Aim: There is good evidence that doctors interpret research poorly, however there has been little investigation as to how interpretation might be improved. Our aim was to determine whether presenting results with increasing levels of information in terms of *P* values (*P*), 95% confidence intervals (CI), and confidence levels (CL) leads to better interpretation.

Methods: Physicians in 2 Singapore teaching hospitals were randomly allocated 1 of 3 questionnaires, each using a different method to present the results of the same 5 artificial studies. The study results were presented with *P*, *P*+CI or *P*+CI+CL depending on the questionnaire. Physicians classified study results depending on conclusiveness, and statistical and clinical significance. Study scenarios and correct answers were based on published reports.

Results: Median age of the 71 participants was 37 (range 25-67) years: 45% were specialists and 55% registrars. 41% had postgraduate training in statistics. 75% read 1-5 journal articles per month, and 18% more than 5. 85% were involved in research, and 69% had first author publications. 32% were journal reviewers/editors. The mean number of correct interpretations (out of 10) for the 3 randomised arms was 6.9 (*P*+CI+CL), 5.5 (*P*+CI) and 5.0 (*P*) (test for trend, *P* = 0.01).

Conclusion: We provide the first randomised evidence that physicians interpret research differently depending on the mode of result presentation. Reporting results with more information in terms of 95% confidence intervals and confidence levels leads to significantly better interpretation by physicians, researchers, journal readers, reviewers and editors compared to *P* values alone.

I077/MPC**Evaluation of Physician Clinical Performance in a New Asian Radiation Oncology Centre: Quality Equipment Does Not Guarantee Quality Practice**

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Aim: A regional (non-Singaporean) Asian radiation oncology centre staffed by nationally-accredited radiation oncologists (ROs) commenced operation in 2003. TCI-Singapore was tasked with auditing radiotherapeutic management received by patients.

Methods: The regional centre wished to remain anonymous. A Singapore RO audited 100 randomly selected patients simulated for radiation by the centre in 2003. Patient charts, radiation prescription, planning CTs, and simulation/verification films were scored using validated criteria.

Results: Median patient age was 48 (range 10-85) years. Primary sites included CNS (22%), head and neck (18%), NSCLC (16%), unknown primary (10%), colorectal (9%) and haematological (6%). Treatment was radical (62%), palliative (32%), benign (2%) and unknown (4%). Deficiencies occurred in documentation, QA and performance criteria. For example, documentation of stage/histology/primary site was inadequate in 38%, portal imaging was unsigned in 60%, and simulation films, plans or prescriptions were unsigned in 48%. Field arrangement was inadequate in 34% of cases, portal films and simulation/verification films differed significantly and were not rectified in 27%, and radiation dose was inadequate in 7%. Specific examples included a nasopharyngeal cancer patient receiving 70 Gy to the whole cervical cord, and a NSCLC patient where treatment missed the target by 10 cm throughout radiotherapy.

Conclusion: A significant proportion of patients audited received suboptimal care, likely resulting in compromised cure/palliation or serious morbidity. This study highlights: 1) formalised training is required in countries providing radiotherapy services, 2) regional and international educational/regulatory bodies, and medical industry should play a greater role in RO training in developing nations, 3) purchasing high-end equipment does not compensate for inadequate education.

I078/MPC**Improving the Interpretation of Clinical Research by Oncologists: Results of the PRIMER 2 Randomised Study**

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Aim: The PRIMER 1 randomised study found research interpretation improved when Singapore physicians were provided with more information. PRIMER 2 was designed to determine which method of result presentation leads to the best interpretation of research.

Methods: Chinese oncologists were randomly allocated 1 of 3 questionnaires, each using a different method to present the results of the same 5 artificial studies. Study results were presented with *P* values + 95% confidence intervals + confidence levels (*P*+CI+CL), *P*+CI, or *P*+CL, depending on the questionnaire. Participants classified studies depending on statistical and clinical significance. Study scenarios and correct answers were based on published examples.

Results: Median age of 225 participants was 34 (range 24-65) years: 58% were specialists and 61% had statistics training. Sixty-four per cent read 1-5 journal articles/month, 32% more than 5. Eighty-four per cent had first author publications; 28% more than 5. Seventeen per cent were medical journal reviewers/editors. The mean number of correct interpretations (out of 10) for the 3 randomised arms was 3.6 (*P*+CI+CL), 2.8 (*P*+CI) and 2.7 (*P*+CL). The odds ratio (OR) of correct interpretation for *P*+CI+CL compared to *P*+CI was 1.4 (*P* = 0.04, 95% CI 1.02-1.96, 98% confidence that *P*+CI+CL is superior), with no difference between *P*+CL vs *P*+CI. *P*+CI+CL was most beneficial for scenarios classified as statistically significant and clinically relevant (OR 2.3, *P* = 0.004), statistically significant (OR 1.7, *P* = 0.002), and conclusive (OR 1.6, *P* = 0.02).

Conclusion: Presenting research results using P+CI+CL leads to better result interpretation compared to P+CI or P+CL. We advocate that medical journals request confidence levels, 95% confidence intervals, and *P* values for endpoint reporting.

I079/MPC

Study on Simultaneous Inter-arm Blood Pressure Measurements in Acute Stroke Patients

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Aim: Accurate determination of blood pressure is crucial in the management of acute stroke patients. Limited research has been done on the inter-arm blood pressure differences in such patients. The aims of our study are to determine whether any such difference exists and whether factors such as severity of stroke and presence of flaccidity or spasticity, have any influence on the blood pressure readings.

Methods: This is a prospective study on patients with a first-ever unilateral stroke of less than a month's duration. Blood pressure measurements were taken simultaneously from both arms using 2 standardised automated blood pressure monitors. Other parameters recorded included handedness, power and tone of the upper limbs as well as the upper limb arm circumference.

Results: Of the 50 patients recruited thus far, 52.9% were males with a median age of 63.4 years. They were enrolled, on average, 2 weeks after stroke onset. In half of them, the affected upper limb was flaccid. The mean difference in inter-arm systolic blood pressure was 2.08 mmHg (95% CI -5.5-1.3) and the mean difference in inter-arm diastolic blood pressure was 1.45 mmHg (95% CI -3.2-1.3). Factors such as inter-arm difference in circumference, tone and power of the affected upper limb did not have any significant effect on the blood pressure readings.

Conclusion: This preliminary study did not show any significant difference in the blood pressure readings between those taken on the normal upper limb as compared to the hemiplegic limb in patients with acute stroke.

I080/MPC

Cost Effectiveness Analysis of Osteoporosis Treatment in the Prevention of Fractures in Singapore

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Aim: To estimate the cost effectiveness of bisphosphonates (Alendronate, Risedronate and Etidronate) or Raloxifene versus no therapy over a 2-year treatment period in patients with osteoporosis and in those with previous fragility fracture.

Methods: A cost-effectiveness analysis using local cost data and clinical data from meta-analysis or randomised controlled trial. The main perspective of the economic evaluation was that of healthcare purchaser. Based on this perspective, only direct healthcare costs were considered in the evaluation. A decision analytic model was used in the evaluation. Five interventions were considered in the decision analytic model in 2 separate groups of patients. A 2-year time horizon was chosen as clinical data about the efficacy of the various interventions considered are available.

Results: The results of the evaluation of the cost-effectiveness of the various interventions showed that it is not cost-effective to treat all patients. However, the analysis performed did not consider indirect and intangible costs in the evaluation process (due to the perspective used in the evaluation). The ranking and magnitude of the incremental cost-effectiveness ratio of the various treatments did not change by the sensitivity analyses using the 95% CI of the efficacy data.

Conclusion: If treatment is indicated, then it would be prudent to consider cyclical etidronate if the risk of hip fracture is low. Raloxifene can be considered if patients will benefit from other non-osteoporosis indication in this group of patients. However, in patients who have high risk of hip fracture, alendronate or risedronate will be more appropriate.

I081/MPC

An Oriental Inception Cohort of Early Rheumatoid Arthritis

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Aim: To obtain a profile of Oriental patients with Rheumatoid Arthritis (RA) with less than 2 years' disease duration treated in a major tertiary centre in Singapore.

Methods: An early RA registry has been established in the department since September 2001. Demographic characteristics, clinical features, therapies, DAS 28, Health Assessment Questionnaire (HAQ) score, Rheumatoid Attitude Index (RAI), ACR Functional Class and SF-36 are entered into a standard protocol.

Results: There was a total of 218 patients with F:M ratio 4.3:1, the majority being Chinese (79%). The overall mean disease duration was 5 ± 5 months (range 0-24) and mean age at diagnosis was 49 ± 12 years. The mean duration of symptoms prior to seeking medical treatment and diagnosis was 6 ± 4 months. The mean DAS 28 score was 4.2 ± 1.5 at recruitment. Most of the patients were in ACR Functional Class 1 (68%). The disability of these patients was moderate: mean HAQ score was 0.6 ± 0.64. Learned helplessness in this group of patients was moderate with the helplessness subscale of 42 ± 6. At this early stage of disease 8 patients (3.7%) were unemployed as a result of this illness. The majority of patients (91%) were commenced on low dose oral prednisolone. The disease modifying drugs (DMARDs) prescribed were methotrexate (56%), sulfasalazine (34%) and hydroxychloroquine (8%).

Conclusion: In this cohort of early arthritis patients, significant disability and impaired function were observed and this has important impact on employment. The prospective longitudinal follow-up of this cohort of patients will provide more information about their prognosis and the related predictive factors.

I082/MPC

Diagnostic Value of Anti-cyclic Citrullinated Peptide Antibody in Southeast Asian Patients with Rheumatoid Arthritis

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Aim: To evaluate the sensitivity and specificity of anti-cyclic citrullinated peptide (anti-CCP) antibody in rheumatoid arthritis (RA) patients and to correlate anti-CCP and rheumatoid factor (RF) levels in patients with rheumatoid arthritis (RA), Sjogren's syndrome (SS), systemic lupus erythematosus (SLE) and normal controls. Serum cytokine levels were also compared in patients with or without RF.

Methods: Anti-CCP antibody was measured using ELISA in 59 RA patients, 20 SS, 20 SLE and 47 normal controls. The revised 1987 American College of Rheumatology criteria for RA, 1982 revised criteria for SLE and the European classification criteria for SS were used. Sensitivity and specificity of anti-CCP level were compared between various rheumatic diseases and normal controls.

Results: The sensitivity and specificity of anti-CCP antibody were 62.3% and 92.1% respectively whereas the sensitivity and specificity of RF were 82% and 65% respectively. Unlike SLE, SS and normal controls, there was a strong correlation between IL1 and IL6 in RA patients ($\rho = 0.72$, $P < 0.001$). Significant correlation was found between anti-CCP and RF ($\rho = 0.58$, $P = 0.0004$). Neither RF nor anti-CCP correlated significantly with IL1 or IL6. Significant correlation was found between TNF and anti-CCP ($\rho = 0.52$, $P = 0.002$) as well as TNF and RF ($\rho = 0.55$, $P = 0.001$)

Conclusion: Anti-CCP was more specific but less sensitive than RF in our local RA population and therefore can be used to distinguish RA from SLE and SS. A significant correlation was also found between anti-CCP, RF and TNF.

I083/MPC**What Does Patient Global Assessment of Health Measure When SLE Patients Are Asked to Evaluate Their Own General Health?**KO KONG¹, BYH THONG¹, TY LIAN¹, ET KOH¹, YK CHENG¹, HS HOWE¹, AL ET¹¹Department of Rheumatology, Allergy and Immunology, Tan Tock Seng Hospital, Singapore

Aim: Patient global assessment of health (PatGA) is frequently used as a summary index of disease impact on health. We sought to elicit important factors associated with poor health in the PatGA in systemic lupus erythematosus (SLE) patients.

Methods: SLE patients (fulfilling ACR criteria or with histologic evidence of SLE) were consecutively enrolled into a prospective study cohort with demographic, clinical and laboratory data, SLEDAI and SLAM disease activity indices, the SLICC damage index, and quality of life index (SF-36) being collected. Physician global assessment of disease activity (PGA) and patient estimation of overall health (PatGA) were scored using visual analogue scales.

Results: A total of 460 patients were enrolled, mainly Chinese (78.9%) females (90.9%), with mean age 41 ± 13 years, and median disease duration 7.1 (2.8-13.7) years, the median for SLEDAI score was 2 (0-4), SLAM score 2 (0-4), PGA 9 (1-23) and PatGA 23 (11-43). SF-36 median scores for physical function was 80, role-physical 100, social function 87.5, role-emotional 100, mental health 68, general health 57, vitality 60 and bodily pain 74. PatGA correlated weakly with PGA, SLEDAI and SLAM (ρ : 0.16-0.21) but significantly with most SF-36 domains (ρ : 0.23 to 0.50). The main factors affecting PatGA were the vitality and helplessness scale when adjusted for age, gender, race and disease duration.

Conclusion: PatGA reflects the effect of SLE on energy level and the helplessness in disease state and tended to relate more with quality of life than physical effects of disease.

I084/MPC**Early Oriental Lupus Cohort – A Prospective Follow-up of Newly Diagnosed Lupus Patients of Oriental Ethnicity**KO KONG¹, BYH THONG¹, TY LIAN¹, WG LAW¹, YK CHENG¹, HS HOWE¹, AL ET¹¹Department of Rheumatology, Allergy and Immunology, Tan Tock Seng Hospital, Singapore

Aim: Prospective cohort studies of systemic lupus erythematosus (SLE) from Asia are few. Thus, we sought to prospectively study our cohort of early (disease duration <3 years) Oriental SLE patient.

Methods: SLE patients who fulfilled ACR criteria were consecutively enrolled into a prospective study cohort with 4-monthly assessments of demographic, clinical and laboratory data, SLEDAI and SLAM disease activity indices, the SLICC damage index, and quality of life index (SF-36).

Results: Out of 460 patients, 118 had early lupus (48% newly diagnosed), mainly Chinese (72.0%) females (92.4%), with mean age 35 ± 13 years, disease duration 14 ± 12 months; although 7% had <4 ACR criteria at recruitment. The median SLEDAI score was 4 (range 2-8), SLAM score 3 (1-6), and SLICC 1 (0-1). The commonest manifestations were mucocutaneous (75.6%), haematological (67.4%), and constitutional (53.3%). Major internal organ involvement was frequent (53.3%: 28.9% renal 22.2% neuropsychiatric). There were 83.5% with antibodies to dsDNA, 90.7% antinuclear antibodies and 71.1% hypocomplementaemia. Compared to the overall cohort, early lupus patients had more cutaneous and less cardiac and renal involvement, higher average disease activity, they were older at diagnosis (34 ± 1 vs 31 ± 1 years, $P = 0.04$), and more adversely affected in role-physical, role-emotional and social function domains of the SF-36. Corticosteroids (74.8%), hydroxychloroquine (75.2%) and immunosuppressants (34.1%, mainly cyclophosphamide and azathioprine) were the main drugs used.

Conclusion: Major organ involvement is common in the early lupus cohort. Limitation of role and social functioning are adversely affected with the initial diagnosis of SLE.

I085/MPC**Severity of Anaemia Reflects Disease Activity But Not Associated with Damage Accrual in Systemic Lupus Erythematosus (SLE)**

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Aim: Anaemia has been a non-specific indicator of disease activity of SLE in the absence of haemolytic anaemia. We seek to investigate the association of the severity of anaemia and disease activity in SLE patients.

Methods: SLE patients (fulfilled ACR criteria or had histologic evidence) were recruited. Demographic, clinical and laboratory information, disease activity indices (SLEDAI, SLAM) and damage index (SLICC) were collected. Physician global assessment (PGA) of disease activity was scored using visual analogue scale. Severity of anaemia were expressed as 3 categories: normal (hematocrit, Hct >35%), mild (Hct: 30%-35%), and significant (Hct <30%).

Results: 460 patients had been recruited with mean age 41 ± 13 years, median disease duration 7.1 (range 0-36) years. The median SLEDAI score was 2 (0-39) corresponding with SLAM: 2 (0-28) and PGA: 9 (0-100). The median SLICC was 1 (0-8). Overall, 25% of patients had anaemia at recruitment, with 6% having significant anaemia. Anaemia is significantly more commonly found in those with renal involvement (29.9% vs 18.6%, $P = 0.02$). Significantly higher disease activity, whether assessed using SLEDAI, SLAM or PGA, was noted in worse anaemia ($P < 0.001$). This was not observed in the cumulative damages.

Conclusion: Anaemia is common in SLE and associated with higher disease activity but not cumulative damage. It is a useful and simple tool in assessing SLE disease activity, in particularly among those with renal involvement when haemolytic anaemia is excluded.

I086/MPC**Relationship Between Psychosocial Factors and Risk of Developing Eating Disorders in Young Females**TF HO¹, HC LIM¹, T JAYABASKAR¹, EL LEE², PH LIOW³, S CHENG⁴¹Physiology, Faculty of Medicine, National University of Singapore, Singapore, ²Department of Medicine, Singapore General Hospital, Singapore, ³Department of Medicine, Alexandra Hospital, Singapore, ⁴Department of Child and Adolescent Psychiatry, Institute of Mental Health/Woodbridge Hospital, Singapore

Aim: The aim of this study was to identify the social and psychological risk factors which may predispose young females to develop Eating Disorders (ED).

Methods: A set of self-administered questionnaires consisting of an Eating Attitude Test (EAT), an Eating Disorder Inventory (EDI) and a socio-demographic questionnaire was administered to 4466 young females (12-26 years old; 79% Chinese, 11% Malays, 7% Indians, 3% Others). Based on cutoff values of 29 for EAT and/or 14 for EDI-Drive for Thinness (EDI-DT) subscale, respectively, subjects were categorised into either "Normal" (NM) or "At Risk" (AR) of ED. Psychosocial variables that were univariately associated with AR were further analysed using multivariate logistic regression to identify predictors of AR.

Results: Prevalence of AR was 7.4% (n = 329). Seven psychosocial variables were identified as significant predictors of AR. In particular, odds ratios of factors like desiring for BMI in underweight range, has ever been on diet and family history of psychiatric illness were significantly high at 2.07, 5.38 and 1.99, respectively. The other factors include items in the EDI subscales relating to bulimia, perfectionism, interoceptive awareness and body dissatisfaction (odds ratios 1.24, 1.12, 1.10 and 1.11, respectively).

Conclusion: Several psychosocial factors were found to be significant independent predictors of increased risk for eating disorders in young females. These factors had significantly high odds ratios ranging from 5.38 to 1.10.

I087/MPL**Plasma Risperidone Concentrations and Clinical Response in Patients with First Psychosis**S VERMA¹, CH TAN², YH CHAN³, SA CHONG¹¹Department of Early Psychosis Intervention, Institute of Mental Health/Woodbridge Hospital, Singapore, ²Department of Psychological Medicine, National University of Singapore, Singapore, ³Clinical Trial Epidemiology Research Unit, Singapore**Aim:** To assess the relationship between plasma concentrations of risperidone and its active 9-hydroxy metabolite (9-OH-risperidone) and clinical response in patients with first-episode psychosis.**Methods:** Nineteen patients with first-episode psychosis admitted to the Early Psychosis Intervention Programme in Singapore, who were started on risperidone were recruited for the study. These patients were evaluated at baseline and weeks 2, 6, and 12. Psychopathology was measured using the Positive and Negative Scale for Schizophrenia (PANSS) and assessment for side effects was carried out using the Simpson-Angus Scale (SAS) and Barnes Akathisia Rating Scale (BARS). Steady-state plasma concentrations of risperidone and 9-OH-risperidone were measured at week 12 using a specific HPLC assay.**Results:** There was a significant correlation between plasma concentrations of risperidone and 9-OH-risperidone as well as between risperidone dosage and plasma concentrations of 9-OH-risperidone. Responders (PANSS reduction >40%) had significantly higher plasma levels of the active moiety than the non-responders ($P = 0.022$). A curvilinear relationship between active moiety and PANSS (%) improvement was observed. Patients with higher PANSS amelioration showed RSP + 9-OH-RSP plasma levels ranging from 15 to 25 ng/mL.**Conclusion:** Therapeutic blood level monitoring can be an aid in managing complex or refractory patients with psychosis.**I088/MPL****FLT3 Mutations Are Distinctly Rare and Do Not Appear to Have Prognostic Significance in a Local Cohort of Patients with Myeloid Malignancies**LG LAU¹, WJ CHNG¹, LK TAN¹, BMF MOW¹, ESC KOAY², TC LIU², YK KUEH³¹Department of Haematology-Oncology, National University Hospital, Singapore, ²Department of Laboratory Medicine, National University Hospital, Singapore, ³Department of Medicine, National University Hospital, Singapore**Aim:** To investigate incidence and prognostic significance of FLT3-activating mutations in a population with myeloid malignancies.**Methods:** Patients with newly-diagnosed myeloid malignancies at the National University Hospital from 2000 to 2002 were identified. The diagnostic bone marrow aspirates were sent for polymerase chain reaction studies for internal tandem duplication (ITD) mutations and point mutations of codon 835 of the FLT3 gene. All new patients after 2002 were prospectively investigated. Clinical and histo-cytogenetic data were collected and analysed with the FLT3 mutation data.**Results:** A total of 87 patients with myeloid malignancies between 2000 and 2003 were studied. Of these, 13 were positive for FLT3 mutations (incidence: 14.9%) - 2 (2.3%) point and 11 (12.6%) ITD mutations. The breakdown of the subtypes of myeloid malignancies was: 2 (15.4%) M1, 5 (38.5%) M2, 1 (7.7%) M3, 2 (15.4%) M4 and 3 (23.1%) M5. The breakdown of cytogenetic abnormalities was: 8 (61.5%) normal, 1 (7.7%) good, 3 (23.1%) intermediate and 1 (7.7%) adverse cytogenetics. Both univariate and multivariate analyses for overall (OS) and disease-free survival (DFS) failed to show FLT3-activating mutations as a significant prognostic factor in the whole cohort. It was also not a significant prognostic factor for OS and DFS when analyses were confined to patients with intermediate and normal cytogenetics.**Conclusion:** FLT3-activating mutations are distinctly rare and do not appear to have prognostic significance in a local cohort of patients with myeloid malignancies.**I089/MPL****Circulating Dengue Serotypes in Singapore**A WILDER-SMITH¹, S YOKSAN², A EARNEST³, R SUBRAMANIAM¹, NIPATON¹¹Department of Infectious Disease, Tan Tock Seng Hospital, Singapore, ²Mahidol University, Bangkok, Thailand, ³Department of Clinical Epidemiology, Tan Tock Seng Hospital, Singapore**Aim:** Dengue virus is a flavivirus with 4 virus serotypes, transmitted by mosquitoes of the genus Aedes. Dengue virus infection of all 4 virus serotypes causes a spectrum of illness ranging from asymptomatic to fatal haemorrhagic disease. Co-circulation of various serotypes is thought to increase the emergence of dengue haemorrhagic fever (DHF). We conducted a seroepidemiological study to determine the extent to which the Singapore population has been exposed to dengue and to determine the proportion of circulating virus serotypes.**Methods:** Healthy volunteers between the age of 18 and 30 were recruited consecutively. Dengue antibodies were measured with PanBio Dengue IgG ELISA. The plaque reduction neutralisation assay was performed to determine the serotype.**Results:** Of the 164 enrolled subjects, 39 (23.8%) had a positive dengue serology. The odds ratio of dengue seroprevalence increased with age, and was much higher for foreigners (75%) from SE Asia compared with Singaporeans (18%). The prevalence of dengue virus type 1 was 24%, for type 2: 23%, for type 3: 26% and for type 4: 18%. Of the 39 positive results, 28 (57%) were due to infection with all four viruses, 7 (14%) to 3, and 12 (25%) to 1.**Conclusion:** All 4 dengue serotypes circulate in Singapore, and a large proportion of the adult population in Singapore is co-infected with more than 1 dengue serotype. In spite of circulating multiple types, the DHF rate is low in Singapore, suggesting that the immune enhancement hypothesis is not the only explanation for the development of DHF.**I090/MPL****Identification of HER Proteins in Breast Cancer Using Proteomics**DH ZHANG¹, LK TAI², LL WONG³, SK SETHI¹, ESC KOAY⁴¹Department of Laboratory Medicine, National University Hospital, Singapore, ²Department of Pathology and Laboratory, National University Hospital, Singapore, ³Oncology Research Institute, National University of Singapore, Singapore, ⁴Department of Pathology and Laboratory, National University of Singapore, Singapore**Aim:** Background: The HER-2/neu oncogene is a member of the c-erbB family of receptor tyrosine kinases and is involved in cell growth regulation, cell proliferation, invasion and metastasis. HER-2/neu overexpression also confers resistance to certain chemotherapeutic regimens and therefore results in the poor clinical outcome for the patients with HER-2/neu overexpressing breast carcinoma. Aims: To identify the proteins strongly associated with and/or involved in HER-2/neu-modulated molecular events and potentially used for diagnostic or therapeutic purposes.**Methods:** The proteins from HER-2/neu positive tumours and proteins from HER-2/neu negative tumours were separated using two-dimensional (2-D) gel electrophoresis over a pH range of 3 to 10, and differentially expressed proteins were digested and analysed by tandem matrix-assisted laser desorption/ionisation-time of flight mass spectrometry (MALDI-TOF)-TOF MS/MS. Protein identities were analysed by searching against the NCBI protein database, using Mascot software.**Results:** Twelve proteins with high statistical reliability were identified. They include 14-3-3, Hsp27, triosephosphate isomerase I, phosphoglycerate kinase I, phosphopyruvate hydratase, fatty acid synthase, cathepsin D, haptoglobin, prollyl 4-hydroxylase (beta-subunit), glyoxalase I, annexin II (type I) and PRO2675. The enhanced expression of Hsp27, cathepsin D and triosephosphate isomerase I were further verified by Western blot, reverse-phase protein array and tissue microarrays.**Conclusion:** HER-2/neu overexpression increases the glycolytic metabolism, extracellular matrix degradation and cell protection from stress. The up-regulation of these identified proteins may play a role in the HER-2/neu-mediated tumorigenesis, and are potential therapeutic targets in breast cancer.

I091/MPL**Reproducibility of Measurement for Deep Frozen Serum Procalcitonin PCT Concentration Compared with Fresh Serum Samples of CABG Patients**HD LUO¹, MD COSTA², CTT TAN², CN LEE²¹Department of Medicine, National University Hospital, Singapore,²Department of Cardiac, Thoracic and Vascular Surgery, National University Hospital, Singapore

Aim: Procalcitonin (PCT) has been proposed as an early and specific marker of bacterial infection recently. The influence of cardiopulmonary bypass on production of PCT must be assessed before considering this molecule as a valuable marker of infection after bypass surgery. Before starting the large sample serum test, it is necessary to assess the reproducibility of frozen samples' test results compared with fresh ones.

Methods: Fifty fresh serum samples were obtained from 10 CABG patients who gave informed consent to join in this study at 5 different time points preoperatively and postoperatively. Each fresh sample had 2 aliquot. One was sent to the lab for PCT test at once, the other was deeply frozen and stored in -80°C VIP freezer for 3 months. Each frozen aliquot was sent to the lab for PCT test after 3-month storage.

Results: There is no significant difference in PCT results between fresh samples (Mean: 8.63 ± 12.19, range: 0.06 to 45.23); and frozen samples (Mean: 8.29 ± 11.92, range: 0.06 to 47.52) ($P = 0.2$). The results from fresh samples were correlated significantly with the results from frozen samples ($r = 0.987$, $P = 0.0005$). Reliability Coefficients Alpha = 0.9935.

Conclusion: Compared with fresh serum samples, the measurement for PCT concentration in deep frozen serum has a good reproducibility in CABG patients. PCT test results from massive deep frozen samples might be reliable.

I092/MPL**A Report of the Peroxisome Proliferator Receptor- γ 2 Pro12Ala Polymorphism in Chinese Subjects with Type 2 Diabetes Mellitus and Nephropathy**FYA KOH¹, T GOH², XH XU³, SC LIM¹, CF SUM¹¹Department of Medicine, Alexandra Hospital, Singapore, ²Diabetes Centre, Alexandra Hospital, Singapore, ³Clinical Research Unit, Alexandra Hospital, Singapore

Aim: Peroxisome proliferator-activated receptor- γ 2 (PPAR- γ 2) is expressed predominantly in adipose tissue where it plays an important role in adipocyte differentiation. The Pro12Ala polymorphism in PPAR- γ 2 results in reduced transcriptional activity of PPAR- γ 2 and may be associated with improved insulin sensitivity. Studies of this polymorphism in diabetic nephropathy (DN) have been inconsistent, with conflicting reports of the Ala allele conferring protection from or susceptibility to DN. We explored this polymorphism in a group of Chinese patients with Type 2 Diabetes mellitus (T2DM) and aimed to determine the relationship of the Ala allele with DN.

Methods: A case-control study was conducted in Chinese patients with T2DM where cases ($n = 114$) had proteinuria (urinary total protein >0.5 g/day or Urine albumin/creatinine ratio >500 μ g/mg) OR persistent elevation in serum creatinine while controls ($n = 76$) had T2DM for at least 10 years with urine albumin/creatinine ratio <50 μ g/mg AND normal serum creatinine. Genotyping was carried out using standard polymerase chain reaction and restriction fragment length polymorphism followed by electrophoretic resolution.

Results: The frequency of the Ala allele was 7.5% in cases and 5.9% in controls. There was no statistically significant difference between cases and controls in allele distribution ($\chi^2 = 0.14$, $P = 0.708$).

Conclusion: The PPAR- γ 2 Pro12Ala polymorphism was not associated with DN in our study cohort.

I093/MPL**A Novel Diagnostic DNA Chip: Multiplex Allele-specific Primer Extension Strategy for Detection of 12 Drug-metabolising Gene Polymorphisms**Y LU¹, SKY KHAM¹, A YEOH²¹Department of Paediatrics, National University of Singapore, Singapore,²Department of Paediatrics, National University Hospital, Singapore

Aim: Polymorphisms in drug-metabolising genes can both increase toxicity from chemotherapy and improve treatment outcome. To obtain the optimal therapeutic outcome, a patient's genetic profile should be defined so that the correct dosage can be administered. Unfortunately in most clinical laboratories, genetic tests can be only carried out individually for different mutation, using various PCR protocols or restriction enzymes. This severely limits its application in practice. We therefore aimed to develop a microarray-based platform to simultaneously genotype 12 polymorphisms in 6 important genes (TPMT, NQO1, CYP1A1, CYP2D6, MTHFR and GSTP1) in childhood ALL.

Methods: Two allele-specific primers were designed to interrogate each polymorphism and all primers for wild-type or mutant are pooled to obtain 2 mixtures. Eleven DNA fragments spanning 12 polymorphic sites in 6 genes were amplified in separate tubes under identical PCR conditions, pooled, purified and then subjected to multiplex allele-specific primer extension using 2 primer mixtures respectively. Only fully matched primers were extended with TAMRA-labelled ddNTP. The products were subsequently loaded on DNA chip and extended primers were captured by corresponding oligo tags. The fluorescence then disclosed the genotype in the imaging system. The feasibility was initially validated using plasmids and 15 cord blood DNA.

Results: For each polymorphic site studied, homozygosity showed fluorescence from only 1 of 2 primers while signals from both indicated heterozygosity. Our preliminary test achieved 100% accuracy.

Conclusion: We successfully demonstrated the validity of this novel genotyping strategy which has great potential to become a simple and reliable platform for the genetic test.

I094/MPL**Clinical Significance of Thiopurine S-methyltransferase (TPMT) Mutations – Results of the Screening in a Multiracial Asian Patient Population with Leukaemia**CSN KWOK¹, SH TEO¹, SKY KHAM¹, H ARRIFIN², HP LIN³, TC QUAH¹, A YEOH¹¹Department of Paediatrics, Faculty of Medicine, National University of Singapore, Singapore, ²Department of Paediatrics, University of Malaya Medical Centre, Malaysia, ³Department of Paediatrics, Subang Jaya Medical Centre, Malaysia

Aim: Thiopurine S-methyltransferase is central to the breakdown of thiopurine drugs important in leukaemia. In patients with mutations and thus reduced activity, thioguanine accumulation leads to prolonged myelosuppression and an increased risk of second cancers. Previously, we reported the lower incidence of TPMT carriers in the Singaporean compared to Caucasian population. We now report our TPMT study on a large group of Singaporean/Malaysian children with leukaemia.

Methods: DNA was obtained from 334 children with *de novo* or relapse precursor-B ALL ($n = 273$), T-ALL ($n = 20$) and AML ($n = 41$). TPMT genotyping was carried out using restriction-length fragment polymorphism PCR (RFLP-PCR) for the *3A, *3C and *6 mutations.

Results: Overall, after excluding Caucasians ($n = 4$), mutation-carriers were detected at similar frequencies (4.9%) with our population study (4.5%). Interestingly, Indians exhibited a higher frequency of 10% (2/21), all *3C mutations rather than the previously reported *3A in Southwest Indians. *3A mutations were detected mainly in Caucasians ($n = 2/4$), except for 1 Chinese (his mother was also a carrier). *3C is the predominant mutation in Asians (Chinese, Malay, Indians). An extremely rare mutation reported only once in a Korean, *6, was detected in 2 Chinese (2/191; 1%).

Conclusion: TPMT *3C and *6 appear to be the most important TPMT mutants in an Asian population, unlike in Caucasians. It is worthwhile to correlate the toxicity of thioguanine therapy in these groups of patients to determine the optimal range of drug dosing.

I095/MPL**Cyclooxygenase-2 Expression in Nasopharyngeal Carcinoma: Immunohistochemical Findings and Potential Implications**

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Aim: Cyclooxygenase-2 (COX-2), an inducible prostaglandin synthase,

participates in inflammatory and neoplastic processes. It is expressed by various tumours and contributes to carcinogenesis. Notably, COX-2 inhibitors appear to have tumour suppression effects and are being evaluated in clinical trials. Nasopharyngeal carcinoma (NPC), a common tumour in parts of Asia, carries significant morbidity and mortality. Although COX-2 has been studied in other cancers of the head and neck, there is paucity of data on its expression in NPCs. We seek to study COX-2 expression in NPC and to discuss potential implications.

Methods: Eighty-six cases of NPC diagnosed during 1997 to 2000 were reviewed. COX-2 immunohistochemistry and semi-quantitative assessment of expression in nasopharyngeal biopsies were performed.

Results: Histologically, 92% of NPCs were undifferentiated, 7% were non-keratinizing and 1% was keratinizing. 47% of NPCs had adjacent epithelium that was dysplastic. COX-2 expression was noted in 70% of NPCs, 38% of dysplastic epithelium and only 4% of normal epithelium ($P < 0.005$).

Conclusion: Our study affirms predominance of undifferentiated NPCs and the rarity of the more radio-resistant keratinizing subtype. COX-2 expression is more commonly observed as nasopharyngeal epithelium progresses from normal to dysplastic to carcinomatous. This suggests that COX-2 contributes to the multi-step process of NPC carcinogenesis. COX-2 represents a therapeutic target for COX-2 inhibitors and there is, thus, a basis for the further investigation of this adjuvant treatment modality for NPC. Remarkably, COX-2 inhibitors are known to potentiate the anti-tumour effects of radiotherapy, the latter being the primary treatment of NPCs.

I096/MPL

Urine Cytology: Are ThinPrep™ Smears Superior to Cytospin Smears? – A Comparative Study of 120 cases

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Aim: The ThinPrep technique is gaining popularity in both gynaecologic and non-gynaecologic cytology, including urine specimens. In this study, we evaluated the cell distribution, cell preservation, stain distribution and background of the smears as well as the diagnostic accuracy of ThinPrep Processing in comparison to the conventional Cytospin technique in urinary cytology.

Methods: Retrospective, randomised and double-blinded evaluation of 120 voided or instrumented urine samples, prepared by both ThinPrep processing and duplicate slides Cytospin preparation were done. For each case, 3 slides were reviewed – 1 ThinPrep and 2 cytospin smears. Each parameter was scored using a semi-quantitative score of 1 to 3.

Results: Quality of cellular distribution, cell preservation and slide background were better with Cytospin preparation ($P < 0.001$), however, there was no significant difference in stain distribution. Sensitivity, positive predictive value (PPV) and negative predictive value (NPV) were higher for Cytospin technique (85.7%, 92.3% and 71.4%) than ThinPrep samples (66.7%, 88.9% and 62.5% respectively). However, specificity of both techniques remain the same.

Conclusion: In practice, the Cytospin smears are of better quality than those prepared by the ThinPrep™ technique. Although ThinPrep and Cytospin smears result in similar diagnostic accuracies in negative cases, the ThinPrep method was not found to be superior to Cytospin smears in diagnosing positive urinary cytology.

I097/MPL

Implementing Molecular Diagnostics in the Diagnostic Laboratory: Rapid Identification of Candida Species in Blood Cultures

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Aim: Candidaemia is increasing, particularly in patients undergoing treatment for cancer and immune modulation after organ transplantation. The choice of antifungal chemotherapy depends on the species. From the time that a blood culture is shown to have a yeast in it, the laboratory may take 4 days to issue a final identification. Meanwhile clinicians may choose to use amphotericin which shows renal toxicity, is unpleasant for the patient and has to be

administered intravenously. Alternatives such as the azole drugs can be given orally and are more acceptable to patients but are not active against all candida species. A rapid identification of candida species would help tailor therapy sooner, to the patient's advantage. **Aim:** To use PCR methods to identify yeasts to the species level and report the result the same day that we see a 'yeast' in the blood film.

Methods: We reviewed the literature, optimised and then validated a multiplex PCR system for use with blood cultures.

Results: We achieved 100% sensitivity and specificity.

Conclusion: This can be used in daily practice. Justification of the cost is not easy. Investment in this technology can be expected to improve outcome, reduce length of stay and reduce other investigations. While the laboratories bear the burden of introducing expensive technology the benefits are seen elsewhere. The 'silo' view of accounting has to be broken down to make the best use of modern technology to help our patients effectively and efficiently.

I098/MPL

Accuracy of the Various Iron Parameters in the Prediction of Iron Deficiency in a Tertiary Hospital

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Aim: Iron parameters like serum ferritin and iron saturation are routinely used in diagnosing iron deficiency. However, these tests are influenced by many factors. We aimed to review the accuracy of iron studies among inpatients in a single institution.

Methods: From 1997 to 2002, bone marrow aspirate samples which had concurrent iron studies done were analysed. Accuracy of the various iron parameters was analysed using ROC curves. Iron parameters which discrepantly predict the presence of iron deficiency were studied.

Results: Among 92 bone marrow samples, 58, 86 and 83 had a concurrent serum ferritin, serum iron and % iron saturation respectively. Serum ferritin is the best marker for predicting the presence of iron deficiency. This is followed by % iron saturation and lastly by serum iron. A serum ferritin of < 0.0001 .

Conclusion: A serum ferritin of < 60 ng/mL or a % iron saturation of $< 7\%$ is highly predictive of iron deficiency. In discrepant cases, the % iron saturation is most likely the spurious result.

I099/MPL

Resveratrol Inhibits Drug-induced Apoptosis in Human Leukaemia Cells by Creating an Intracellular Milieu Nonpermissive for Death Execution

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Aim: Efficient apoptotic signalling is a function of a permissive intracellular milieu created by a decrease in the ratio of superoxide to hydrogen peroxide and cytosolic acidification. Resveratrol (RSV) triggers apoptosis in some systems and inhibits the death signal in others.

Methods: Techniques employed included western blotting, various fluorescent and colorimetric assays.

Results: Exposure of human leukaemia cells to low concentration of RSV (4–8 μ M) inhibits caspase activation, DNA fragmentation and translocation of cytochrome-c induced by hydrogen peroxide or anticancer drugs C2, vincristine and daunorubicin. Interestingly, at these concentrations, RSV induces an increase in intracellular superoxide and inhibits drug-induced acidification. Blocking the activation of NADPH oxidase complex neutralised RSV induced inhibition of apoptosis. Furthermore, our results implicate intracellular hydrogen peroxide as a common effector mechanism in drug-induced apoptosis that is inhibited by preincubation with RSV. Interestingly, decreasing intracellular superoxide with NADPH oxidase inhibitor diphenyliodonium reversed the inhibitory effect of RSV on drug-induced hydrogen peroxide production.

Conclusion: We show that low concentrations of RSV inhibit death signalling in human leukaemia cells via NADPH oxidase-dependent elevation of intracellular superoxide that blocks the mitochondrial hydrogen peroxide production, thereby resulting in an intracellular environment nonconducive for death execution. These findings have significant clinical implication

given the heightened interest in the potential use of RSV in combination chemotherapy regimens. Due to the low bioavailability of RSV, our data suggest death-inhibitory activity of RSV in leukaemia cells at doses that may be relevant physiologically.

I100/MPL

The Effect of Airway Administration of Lignocaine on the Murine Model of Allergic Asthma

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Aim: Lignocaine has been reported to be effective in the treatment of asthma in humans. We sought to investigate the effects of lignocaine on airway inflammation and airway hyper-responsiveness (AHR) in a murine model of allergic asthma.

Methods: On days 0 and 14, 6- to 7-week-old BALB/c mice were sensitised by intraperitoneal injection of ovalbumin (OVA), followed by intranasal challenge OVA on days 14 and 25 to 28. Intranasal lignocaine (1 mg/kg) was administered 1 hour before the last 4 challenges. On day 29, AHR was determined with whole-body plethysmography. Subsequently, the mice were sacrificed. Bronchoalveolar lavage (BAL) and histological sections of lungs were obtained.

Results: Treatment with lignocaine caused a significant reduction in the AHR. There was also an increase in eosinophil and decrease in macrophage numbers in the BAL. Histologic sections showed a decrease in the tissue eosinophilia.

Conclusion: Treatment with lignocaine reduced the severity of AHR with modest effect on the airway inflammatory cellular infiltrate.

I101/MPL

Successful Use of Human Serum for the Culture of Human Melanocytes Opening New Doors in the Treatment of Vitiligo

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Aim: Traditionally, fetal bovine serum (FBS) is used to culture melanocytes. However, FBS, or its substitute, presents risks of foreign protein contamination as well as transmission of viral or prion-related diseases if used in culture of cells intended for human transplantation. Human serum has been used to culture osteoblast but has never been used for the culture of melanocytes. This study aims to evaluate the use of human serum, as compared to FBS substitute, UltrosorG, in the culture of melanocytes.

Methods: Suction blisters were induced from volunteers, trypsinised and cultured in T25 flasks. At confluence, 1 x 10⁴ melanocyte cells were plated onto multiwell plates and cultured for 11 days in medium supplemented with human serum at different concentrations, 2% UltrosorG and medium without serum substitute. The cells were counted using haemocytometer at Days 4, 8 and 11.

Results: Ten sets of melanocytes from different volunteers were cultured. All cultured melanocytes were able to grow well in media supplemented with human serum. There was no significant difference between proliferations of melanocyte in 5% human serum as compared to 2% UltrosorG. However, 10% and 20% human serum resulted in a faster rate of cell proliferation than UltrosorG.

Conclusion: Melanocyte cells can be cultured using human serum, in place of FBS, for transplantation onto vitiligo patients. Culture media containing more than 5% human serum resulted in a faster increase in the number of melanocytes when compared to 2% UltrosorG.

I102/MPL

The Ras Kinase Pathway Inhibitor and Likely Tumour Suppressor Proteins Sprouty 1 and Sprouty 2 Are Deregulated In Breast Cancer

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Aim: Sprouty (Spry) proteins were found to be endogenous inhibitors of the Ras/MAP kinase pathway that play an important role in the remodelling of branching tissues in development. We investigated Spry expression levels in various cancers and found that Spry1 and Spry2 were consistently down-regulated in breast cancers.

Methods: Real time PCR, *in situ* hybridisation, immunohistochemistry, proliferation assays, colony forming assays, *in vivo* xenograft nude mice assays.

Results: Spry1 and 2 were expressed specifically in the luminal epithelial cells of breast ducts, with higher expression during stages of tissue remodelling when the epithelial ducts are forming and branching. The abrogation of endogenous Spry activity in MCF-7 cells by the over-expression of a previously characterised dominant negative mutant of Spry, hSpry2Y55F resulted in enhanced cell proliferation *in vitro*. hSpry2Y55F stably expressing cells also formed larger and a greater number of colonies in the soft-agar assay. An *in vivo* nude mice assay demonstrated a dramatic increase in the tumorigenic potential of hSpry2Y55F stable cells.

Conclusion: The consistent down-regulation of Spry1 and 2 in breast cancer and the experimental evidence utilising a dominant-negative hSpry2Y55F indicate that Spry proteins may actively maintain tissue integrity that runs amok when their expression is decreased below normal threshold levels. This supports a previously unrecognised role for Sprys in cancer development.

I103/NUR

Family Coping with Bereavement – The Perceptions and Role of Nurses in the Emergency Department

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Aim: Death occurs frequently in the Emergency Department (ED), leaving behind bereaved families. Bereavement care for these families is an un-addressed issue. This study aims to determine the perceptions of ED nurses concerning bereavement care provision in the ED.

Methods: A survey was conducted from 17 February to 28 February 2003 using a self-administered questionnaire asking about enabling factors and barriers to bereavement care provision. Nursing officers and registered and enrolled nurses working in ED of 2 urban acute general hospitals were recruited.

Results: Sixty-six questionnaires were returned out of 100 distributed. The mean age of the nurses was 31.4 (Standard deviation 8.7) years. Almost all the nurses (97%) felt that bereavement care should be provided by support services e.g. medical social services. Most nurses (77%) felt that bereavement care is an extension, rather than a natural part of their nursing role. The majority of nurses (92%) felt that both registered and enrolled nurses should play equal roles in providing bereavement support and that doctors should play an active role too. Lack of manpower is deemed the most important barrier while appropriate training and establishing a dedicated bereavement care service are considered the most important enabling factors in delivering bereavement care.

Conclusion: The majority of ED nurses do not perceive bereavement care as part of their natural nursing role. The ED needs to decide if ED nurses should provide bereavement care, and if so, change their perceptions and provide the necessary resources including training.

I104/NUR

A Process Improvement to Provide Analgesia Earlier to Patients in Pain

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Aim: Traditionally, parenteral pain-relief was administered after a patient had seen an ED doctor. A pre-implementation study showed that an average waiting time for analgesia was 74 minutes (95% CI 69-79). To offer and administer analgesia to patients presenting with pain secondary to musculoskeletal injuries and minor injuries in the earliest possible time.

Methods: A protocol-based nurse-delivery of analgesia was implemented on 18 April 2004. All patients presenting with pain secondary to musculoskeletal injuries and minor injuries were asked at triage to rate their pain intensity on the Numeric Rating Scale (NRS) or Faces Pain Scale with a range of 0-10. To

patients with NRS of equal or more than 7, the triage nurse offered intramuscular Ketorolac as per protocol. If NRS was less than 7, the nurse would give intramuscular Ketorolac upon request if there was no contraindication. We compared the mean door-to-analgesia time for month-long samples pre and post study implementation.

Results: Of the 554 patients presenting with pain secondary to musculoskeletal injuries and minor injuries, 96 patients were given analgesia at triage. Seventy-two patients had NRS of equal to or more than 7. Twenty-four patients had NRS of less than 7. Forty-six patients declined analgesia although their NRS was equal to or more than 7. The mean door-to-analgesia time was 13.2 minutes (95% CI, 11-15). The door-to-analgesia time was reduced by 82%.

Conclusion: A change in processes whereby a nurse-initiated pain management protocol effectively allowed earlier delivery of parenteral analgesia to patients in pain.

I105/NUR

Utility of Subjective Visual Impairment in Managing Frail Elderly Outpatients

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Aim: To examine the utility of a patient-response screening question for visual impairment with regards to diagnosis and impact on function (alone and in combination with hearing impairment).

Methods: Retrospective study of 124 consecutive new cases attending the geriatric assessment clinic, Tan Tock Seng Hospital, from June to December 2003. All cases underwent nurse clinician assessment before clinical consultation. The screening question for visual impairment was compared with objective measurement by Snellen's chart (>6/12 visual acuity in better eye); hearing impairment was determined by the whisper test.

Results: The prevalence rate of visual impairment was 81.3%. Only 2 patients (0.2%) had a vision-linked complaint, with none being the presenting complaint. The screening question had lower specificity (42.9%) than sensitivity (68.1%) for decreased visual acuity; this improved to 54.5% when compared with an alternate definition incorporating monocular visual impairment. It was able to identify those with falls ($P < 0.05$).

Conclusion: Visual impairment is common and can be easily missed unless systematically looked for. Subjective visual impairment appears to be able to identify a select group with monocular visual impairment and functional consequences. We propose the strategy of a patient-response screening question for visual impairment, combined with whisper test, for detection of significant functional impairment in management of frail elderly outpatients.

I106/NUR

A Study on the Utilisation of Dementia Day Care Services

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Aim: 1) To determine the acceptance of dementia day care (DDC) centre referrals by carers of newly diagnosed dementia patients. 2) To explore the reasons why some carers decline referrals to DDC.

Methods: This is a prospective, observational study involving carers of 100 consecutive cases of newly diagnosed dementia. Within the first 3 months of diagnosis, each carer was given standardised information on the benefits of DDC and the subsequent response to a suggested DDC referral was documented. The relationship between the carers' response and patient-, carer- and facility-related variables were explored.

Results: Of the 100 carers studied, 91 declined DDC referral, giving an acceptance rate of only 9.0%. The decision by caregivers to utilise DDC was significantly related to the stress level experienced, as measured by the Relative Stress Scale (RSS) ($P = 0.031$). Among these, fear of accidents to patients ranked as the most stressful item, followed by feelings of anger and frustration at patients. Among those who declined DDC referral, 61 carers (67.0%) felt that they were coping well, while 56 carers (61.5%) did so out

of agreement with patient's expressed rejection of DDC.

Conclusion: The decision by carers to utilise DDC is significantly associated with the stress level experienced. Conversely, carers who are coping well do not see the need for DDC despite being explained the possible cognitive and social benefits to patients. Many carers also tend to go along with the expressed refusal of DDC by patients.

I107/NUR

The Usage of Alternative/Complementary Medicine Among Parkinson's Disease Patients

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Aim: To determine the frequency of usage of alternative/complementary medicine (ACM) among patients with Parkinson's Disease (PD) in Singapore.

Methods: A structured questionnaire was administered by interview to 160 consecutive PD patients seen at the Movement Disorders Clinic of National Neuroscience Institute, Singapore, over an 8-week period about their use of ACM for PD. Patients who had concurrent dementia with CMMSE equal or less than 21 were excluded.

Results: A total of 98 patients used ACM for PD. The mean age of the patients was 60.8 years with 67 (68.3%) male patients. The ethnicity of these 98 patients was as follows: 85 (86.7%) Chinese, 8 (8.1%) Indians, and 5 (5.1%) Malays. Ninety-eight patients used 200 forms of ACM; of these, 35 (35.7%) patients used 1 ACM, 36 (36.7%) patients used 2 ACMs, 19 (19.3%) used 3 ACMs, 5 (5.1%) patients used 4 ACMs, and 3 (3.0%) patients used 5 ACMs. The 4 most commonly used ACM among patients were Traditional Chinese Medicine (TCM) (51%), acupuncture (44.9%), vitamins (37.7%), and massage therapy (31.6%). The least commonly used were Traditional Malay Medicine (TMM) and aromatherapy at 0.02% each. The majority (83.7%) did not inform their doctors about their use of ACM. Five patients (5.1%) missed their anti-PD medicines while on ACM. Of the 200 forms of ACM used, 120 (60%) did not improve the PD symptoms.

Conclusion: The use of ACM is common among PD patients. The majority did not inform their doctors about their use of it.

I108/NUR

Hand Hygiene Compliance by Healthcare Workers in an Acute Hospital

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Aim: Hand hygiene is critical in preventing cross-infections in hospitals. However, reports of hand hygiene compliance among healthcare workers (HCWs) have been low at 30% to 50%. The objective of this study was to evaluate the baseline hand hygiene compliance in Tan Tock Seng Hospital (TTSH) before and after patient contact.

Methods: An audit of hand hygiene was conducted in Tan Tock Seng Hospital in June 2004. Three hundred and thirty HCWs in 30 wards were observed during 2-hour periods of the morning and afternoon shifts for 2 weeks.

Results: Hand hygiene before and after patient contact was 3.6% and 53% respectively. HCWs were more likely to clean their hands after "long" patient contact (72.2%) than after "short" patient contact (30%). However, among those HCWs who practised some form of hand hygiene after patient contacts, 95.4% did not adhere to the recommended 6-steps handwashing technique. Allied HCWs had the highest compliance rate for hand hygiene after patient contact. Non-compliance to hand hygiene after gloves removal was highest among enrolled nurses/healthcare assistants (26%).

Conclusion: Hand hygiene is the most effective way to prevent nosocomial infections. Knowing the baseline rates of hand hygiene compliance is essential in planning active intervention programmes to improve hand hygiene practices. Understanding why different groups of HCW's seem to have different levels of compliance would help in designing different strategies to improve adherence to hand hygiene.

I109/NUR**Compliance Therapy in Psychotic Patients a Pilot Study on an Intervention to Improve Inpatients Attitude and Compliance with Treatment**

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Aim: A brief intervention, compliance therapy based on motivational interviewing and cognitive approaches lead to improved attitudes to treatment (Kemp et al, 1996, 1998). During patient education session, the researcher who was trained in cognitive-behavioural therapy, and attended a workshop on motivational interviewing, practised the intervention as described. The shortened version of Drug Attitude Inventory (DAI-10) (Hogan et al, 1983; Dongen, 1997) had been used routinely as a measurement tool before and after patient education. This descriptive study aims to examine the effectiveness of using Compliance Therapy and ways of improvement.

Methods: Patients who were referred for patient education by the doctor and those who were put on the clinical pathway of relapsed schizophrenia/depression in the same ward were included as the sample subjects. A rating scale adapted from Kemp et al (1998) was used to rate patients' compliance.

Results: Among the 69 male subjects, their mean age was 43.5 years. Their mean length of illness was 16 years. The patients in individual or group session both had significantly improved attitude scores after the intervention. Patients with less than 5 previous admissions had more significant improvement but patients with personality disorder and/or history of substance abuse had no significant improvement.

Conclusion: Compliance therapy could be conducted in the form of small groups of 2 to 3 patients but patients with lower pre-DAI-10 score would benefit more in individual session.

I110/NUR**Coping Differences of Stress Between Male and Female Graduates in Hong Kong Australia and Singapore**

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Aim: Coping strategies function as a vital role in the individual's physical and psychological health when faced with negative life occurrences. With the changing work expectations many graduates choose to upgrade their skills. They had to juggle their time with family, study and work, thus, coping with stress. Hence, the aim of this study is to examine the coping differences of stress between the male and female graduates from Hong Kong, Singapore and Australia.

Methods: Two hundred ninety-nine graduates who read Master of Social Counselling responded to the Student-Life Stress Inventory and Coping Inventory for Stressful Situations. Their coping differences were examined as based on the 5 dimensions: task-orientation, emotion-orientation, avoidance-orientation, distraction and social diversion. Inferential statistics with 2 tailed *t*-test ($P < 0.05$) results were used

Results: The results indicated that the male and female graduates' coping strategies on task-orientation ($P = 0.113$) were insignificant. Though the mean score of task-orientated coping showed that the males ($M = 58.08$) was slightly higher than the females ($M = 56.08$). This finding is similar to Endler and Parker (1990; 1994). Moreover, the females use more emotion-orientation ($P = 0.026$), avoidance-orientation ($P = 0.002$), distraction ($P = 0.001$) and social diversion ($P = 0.033$) coping styles compared to the male graduates. These results confirmed the earlier researchers' findings (Endler & Parker, 1990; Hinggis & Endler, 1995).

Conclusion: The finding on the coping differences of stress between male and female graduates on task-orientation was similar ($P = 0.113$). Moreover, the female graduates used more emotion-orientation than their male counterparts.

I111/NUR**Socio Demographic Profile and Outcomes of Relapsed Schizophrenic Patients on Clinical Pathway**MM HENDRIKS¹, R MAHENDRAN², V THAMBYRAJAH², SCB LIM¹,UJA KRISHNAN¹, YH CHAN³*¹Department of Nursing, Institute of Mental Health/Woodbridge Hospital, Singapore, ²Department of General Psychiatry, Institute of Mental Health/Woodbridge Hospital, Singapore, ³Research Division, Institute of Mental Health/Woodbridge Hospital, Singapore*

Aim: The clinical pathway for Relapsed Schizophrenia was introduced in Woodbridge Hospital in July 2003. There are 4 other clinical pathways in use, namely, Major Depression, First Episode Schizophrenia/Schizophrenic Disorder, Alcohol Dependence and Opiate Dependence. This study on 307 patients placed on the Relapsed Schizophrenia pathway from July 2003 to September 2003, aimed at capturing the socio demographic profile of the patients and the significant features that may contribute to their readmission.

Methods: A survey form was designed to capture the data. The researchers then audited the case notes of patients placed on the clinical pathway. Data was coded into the SPSS system and analysed.

Results: There were almost equal numbers of males and females with 42.3% experiencing the illness >10 years, 53.1% having at least 1 to 2 admissions during the year, 74.6% unemployed and 88.6% living with their families. Males were more likely to be readmitted ($P = 0.009$), as well as those with 10 years' duration of the illness ($P = 0.003$). Other significant predictors of readmission are those with at least 1 admission in the past year ($P = 0.025$) and those that did not come for their follow up after discharge ($P = 0.002$).

Conclusion: Clinical pathway assist healthcare in providing quality care for patients through its systemised structure of activities. It also enables the practitioners to collect data on their practices to improve their services to their patients.

I112/SC**Risk Scoring Systems for Preoperative Renal Dysfunction Asian Patients Who Undergoing Open Surgery Using Cardiopulmonary Bypass**GX XU¹, HD LUO², MD COSTA¹, PS WONG¹, CTT TAN¹, EKW SIM¹, CN LEE¹*¹Department of Cardiac, Thoracic and Vascular Surgery, National University Hospital, Singapore, ²Department of Medicine, National University Hospital, Singapore*

Aim: Risk scores are useful for comparing outcomes of open-heart surgery using cardiopulmonary bypass. Different scoring systems are based on different designs and patient populations. This study aims to evaluate the applicability of the Euroscore and Northern New England system to preoperative renal dysfunction Asian patients who undergoing open-heart surgery using cardiopulmonary bypass.

Methods: From 1 September 2002 to 31 October 2003, data of 121 consecutive preoperative renal dysfunction Asian patients who undergoing open-heart surgery using cardiopulmonary bypass in National University Hospital (Singapore) was prospectively collected. Euroscore and Northern New England systems were used to evaluate the mortality predictions for all subjects. Validity of these risk scoring systems was assessed by the area under the receiver operating characteristic (ROC) curve.

Results: The observed mortality for preoperative renal dysfunction Asian patients who undergoing open-heart surgery using cardiopulmonary bypass was 10.7% in this study. The predicted mortalities were $8.7 \pm 4.2\%$ by Euroscore, and $5.7 \pm 4.5\%$ by the Northern New England scoring system. The areas under the ROC curves were 0.77 ($P = 0.01$) for Euroscore and 0.7 ($P = 0.08$) for Northern New England scoring system.

Conclusion: Although derived from a predominantly Caucasian population, Euroscore still can be applicable to preoperative renal dysfunction Asian patients who undergoing open-heart surgery using cardiopulmonary bypass.

I113/SC**Tracheobronchial Airway Stenting for Relieving Malignant Airway Obstruction**PS WONG¹, CF CHONG², HL LIM³, KL KHOO⁴, A CHANG⁵*¹Department of Cardiac, Thoracic and Vascular Surgery, National University Hospital, Singapore, ²Department of Cardiac, Thoracic and Vascular Surgery, National University Hospital, Malaysia, ³Department of Haematology-Oncology, National University Hospital, Singapore,*

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Aim: Obstruction of the airways due to malignant disease is a frightening condition that portends a poor prognosis. Emergency airway stenting can quickly palliate and relieved the obstruction. We retrospectively analysed our data on the management of these patients.

Methods: From 1999 to 2004, records of 11 patients with urgent tracheobronchial stenting using rigid bronchoscopy for palliative relief of airway obstruction were reviewed.

Results: The median age of these 11 patients (6 males and 5 females) was 43 (range, 18 to 69) years. The diagnoses were as follows: NSCLC (7), adenoid cystic carcinoma (1), small cell lung cancer (1), Hodgkin's lymphoma (1) and malignant thymoma (1). A total of 15 airway stents were inserted consisting of 2 tracheal stents, 7 left bronchial stents and 6 right bronchial stents (6 covered/5 uncovered ultraflex stents and 4 polyflex stents). All patients had immediate symptomatic relief. Follow-up is as follows: 6 patients died within a year of stent insertion from their underlying malignancy, 2 were transferred back to their respective countries and were lost to follow up, the 3 remaining patients are still being follow-up by the oncologist. The patient with Hodgkin's lymphoma had regression of her disease with chemotherapy and is well 2.5 years after stent placement.

Conclusion: Malignant airway obstruction from extrinsic or intrinsic causes can be managed by urgent palliative airway stenting, which provide instant relief in an otherwise fatal condition. Their outcome, however, is still poor and is determined by their underlying malignant disease.

I114/SC

Clinical Thyroid Pathways Improve Healthcare for Patients Undergoing Thyroidectomy

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Aim: Cost containment and delivery of cost-effective surgical care have become important considerations for hospitals. Clinical Pathways is one such tool that has been developed to address these problems. In this study we evaluated the effect on cost and clinical outcome with the implementation of clinical care pathway for thyroidectomy patients.

Methods: The thyroidectomy pathway was implemented in 2001, through collaborative efforts of clinicians, case managers, and nurses. From 2002 to 2003, 143 patients were managed on clinical pathway compared to 150 patients (2000 to 2001), who served as controls. All patients were managed in the Department of Surgery.

Results: Control group; age range 15 to 88 (mean, 48.2) years (55 total thyroidectomy, 95 hemithyroidectomy cases). Pathway group; aged between 10 and 83 (mean, 44.4) years (45 total thyroidectomy, 98 hemithyroidectomy cases). Age, co-morbidity, complications, readmission rates did not show much difference between the two groups ($P > 0.05$). There were no deaths for both groups. Mean total length of stay was less in the postclinical pathway patients (1.91 days) compared to preclinical pathway patients (3.33 days) ($P < 0.001$). Mean hospital charges also decreased significantly, from \$3,929 to \$3,524 per patient ($P = 0.003$).

Conclusion: Clinical pathways have been shown to reduce unnecessary variation in patient care, reduce delays in discharge, and improve cost-effectiveness of clinical services. Our study confirms that length of stay and hospital costs are effectively reduced through the implementation of clinical pathway for patients undergoing thyroidectomy.

I115/SC

Multidetector CT in Acute Lower Gastrointestinal Haemorrhage

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Aim: To evaluate the accuracy of multidetector CT (MDCT) in the evaluation of patients presenting with acute lower gastrointestinal bleeding. Acute lower gastrointestinal bleeding is a potentially life-threatening condition which has

historically been evaluated with catheter angiography if endoscopy fails to reach a diagnosis or is incomplete or unsuccessful. Unfortunately, angiography is both invasive and has a very low sensitivity both in our institution and in reports published in the literature. Recently there have been some reports on the use of MDCT in the evaluation of these patients. We set out to validate this technique in our local patient population.

Methods: Twelve consecutive patients presenting with acute lower gastrointestinal bleeding with incomplete, failed or nondiagnostic endoscopy were referred for contrast enhanced MDCT. These patients subsequently had repeat endoscopy or surgery.

Results: MDCT scan was technically successful in all patients, showed the site of bleeding in all patients, and suggested cause in some patients. The patients underwent subsequent repeat endoscopy or surgery to treat the bleeding and confirm cause of bleeding. The detailed radiological, endoscopic, surgical and final histological diagnosis will be presented.

Conclusion: MDCT is a useful, sensitive and accurate technique for evaluating patients with acute lower gastrointestinal bleeding.

I116/SC

Imaging Soft Tissue Tumours

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Aim: There is a wide range of modalities available for assessment of the soft tissues. This study aims to illustrate how different modalities contribute to the final diagnosis of a soft tissue mass.

Methods: Consecutive cases of soft tissue masses of the upper limb which underwent higher modality imaging in the Diagnostic Imaging Department of National University of Singapore from January 2001 to March 2004 were retrospectively reviewed. Of these, 64 cases had histological correlation. We present selected cases which best illustrate the contribution of each modality to the final diagnosis.

Results: There were 37 cases of benign tumour, 7 cases of malignancy, 15 cases of inflammation and 5 cases of reactive change (reactive lymph nodes or fibrosis).

Conclusion: We suggest plain film should be used for initial evaluation of these masses in order to determine the presence of calcification or fat and to demonstrate any associated bone involvement. In many cases ultrasound will confirm the presence of a benign cystic lesion, which may require no further imaging. MRI however remains the modality of choice for many soft tissue lesions in order to determine the origin and extent of the mass. The MR signal characteristics of the lesion may also be helpful in determining the final diagnosis.

I117/SC

Missed Osteosarcoma

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Aim: Several patients with extremity osteosarcomas have been treated by one of the authors (Pho RWH) over the years where the diagnosis of osteosarcoma was not made at initial presentation. A review was conducted to find any signs that could have alerted the clinician to this diagnosis at an earlier stage.

Methods: We conducted a retrospective review of 6 patients with extremity osteosarcomas where the diagnosis was initially missed, analysing how and why the diagnosis was missed at initial presentation.

Results: All the cases had a history of trauma and the attending doctors were unaware of an underlying pre-existing early malignant condition. The radiological findings were subtle and the patient's general condition at initial presentation was normal.

Conclusion: Since extremity osteosarcoma is uncommon, we emphasise a high index of suspicion of malignancy if the natural progression of the original diagnosis of trauma is not seen or if the signs and symptoms worsen. The outcome was significantly poor in all the cases because of a delay in diagnosis.

I118/SC**Cerebral Autoregulation and Pressure Reactivity Following Decompressive Craniectomy**E WANG¹, BT ANG¹, J LIM², I NG¹¹Department of Neurosurgery, National Neuroscience Institute, Singapore,²Clinical Trial Epidemiology Research Unit, Singapore

Aim: Analysis of slow waves in arterial blood pressure (ABP) and intracranial pressure (ICP) has been used as an index to describe cerebrovascular pressure-reactivity. It has been previously demonstrated that the pressure-reactivity index (PRx) can be used to reflect global cerebrovascular reactivity with changes in ABP. A positive PRx signifies a positive association between ABP and ICP, indicating a non-reactive vascular bed while a negative PRx is reflective of intact cerebral autoregulation, where ABP waves provoke inversely correlated waves in ICP. To date, there has been no characterisation of pressure-reactivity following decompressive craniectomy.

Methods: In this prospective observational study, 33 patients who underwent decompressive craniectomy for raised intracranial pressure were studied. The PRx was calculated as a moving correlation coefficient between 30 consecutive samples of values of ICP and ABP averaged for a period of 10 seconds. The time profiles of PRx at 6-hourly intervals were then analysed.

Results: In all patients, the initial PRx 6 hours after surgery was positive, indicative of disturbed pressure-reactivity. With time, the PRx trended towards a more negative value, suggestive of an improving cerebrovascular autoregulatory reserve. The mean PRx at 24 hours was 0.3520 while the mean PRx at 72 hours was 0.2047 ($P < 0.001$).

Conclusion: Surgical decompression, apart from playing a crucial role in management of raised intracranial pressure may have a contribution to the restoration of disturbed cerebrovascular pressure-reactivity.

I119/SC**Changes in Cerebral Haemodynamics and Chemistry During Surgical Evacuation for Hypertensive Intracerebral Putaminal Haemorrhage**IHB NG¹, E YAP², J LIM³¹Department of Neurosurgery, National Neuroscience Institute, Singapore,²Department of Research, National Neuroscience Institute, Singapore,³Clinical Trial Epidemiology Research Unit, Singapore

Aim: The efficacy of surgical decompression in spontaneous intracerebral haematoma in improving outcome is still controversial. Ischemic cell death in the penumbra is likely to be caused in part by intracranial hypertension and decreased cerebral perfusion pressure. Nevertheless, the effects of surgical decompression on neurological parameters have not been systematically studied. The aim of this study was to evaluate the changes in ICP, CPP, PtiO₂, PtiCO₂, brain pH and regional cerebral blood flow (rCBF) by laser doppler flowmetry (LDF) before and after surgery for spontaneous intracerebral haematomas.

Methods: Eight patients who underwent surgical decompression of spontaneous putaminal haematoma were studied. ICP, CPP, PtiO₂, PtiCO₂, brain pH and regional CBF (LDF) was recorded prior to removing the bone flap and then on skin closure on completion of the operation.

Results: Following surgical decompression, mean ICP decreased from 30.5 ± 11.77 to 12.27 ± 9.84 mm Hg ($P < 0.05$); brain tissue oxygenation improved from 18.11 ± 20.01 to 29.75 ± 27.74 mm Hg ($P < 0.05$); brain tissue carbon dioxide changed from 44.75 ± 11.29 to 45.88 ± 15.97 mm Hg ($P < 0.05$); brain pH improved from 6.87 ± 0.34 to 7.09 ± 3.53 ($P < 0.05$). LDF changed from 10.01 ± 6.26 to 11.45 ± 17.50 mL/min/100 g brain ($P < 0.05$).

Conclusion: Surgical decompression for spontaneous intracerebral haematomas does lead to significant reductions in ICP. Improvements in CPP, PtiO₂ and rCBF in the penumbra accompany this to a lower extent.

I120/SC**Invasive Multimodality Neuro-Monitoring in Neurosurgical ICU**

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Aim: The pathophysiology of severe brain injury resulting from various traumatic and non traumatic causes is complex. Continuous invasive

neuromonitoring techniques measure different variables such as brain temperature (BT), brain tissue (PtiO₂) oxygenation, intracranial pressure (ICP) etc. The purpose of the study was to analyse the utility of this online information to compare parameters which predict mortality.

Methods: Twenty-four patients were admitted to the NICU, underwent invasive neuromonitoring, were intubated, sedated and ventilated as per the NICU protocol (GCS <9). BT, ICP, PtiO₂ probes were inserted as an initial procedure or combined with the surgical decompression. The MAP, RT, PtiO₂, ICP, CPP, BT were continuously measured and recorded.

Results: The mean age was 43.8 years. The diagnoses were: closed head injury in 15, basal ganglia bleed in 7, gunshot in 1 and AVM bleed (arteriovenous malformation) in 1. There were 20 survivors. The mean first 24 hours CPP (cerebral perfusion pressure) was lower in nonsurvivors at 60 mmHg as compared to survivors at 80 mmHg ($P < 0.05$). The groups total mean brain temperature fell below the mean total rectal one in non survivors (TOTBT = 34.24°C vs TOTRT = 34.41°C) suggestive of loss of temperature regulation due to the ensuing brain death process. Survivors maintained a positive temperature gradient (TOTBT = 37.61°C , TOTRT = 36.45°C). The survivors also demonstrated a higher TOTPTiO₂ (16.3 mmHg vs 2.8 mmHg in nonsurvivors) ($P < 0.05$). There were no complications related to the insertion of the multimodality monitoring device.

Conclusion: BT, PtiO₂ and CPP were found to be important factors independently influencing outcome. Invasive multimodality neurointensive monitoring can help in directing therapy to improving these parameters and prognosticate outcome in patients with severe brain injury.

I121/SC**What is the Ideal Cerebral Perfusion Pressure in Severe Head Injury (SHI)? – A Multivariate Logistic Regression Study**KK LEE¹, HB WONG², IHB NG³¹Department of Nursing, National Neuroscience Institute, Singapore,²Clinical Trial Epidemiology Research Unit, Singapore, ³Department of

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Aim: Maintenance of adequate CPP is important in SHI to minimise secondary insults from cerebral ischaemia. Conventional methods recommend CPP > 70 mmHg, but some studies advocate lower CPP to minimise risks of medical complications inherent in maintaining a high perfusion pressure. As there is more evidence towards range of 60 to 70 mmHg, the objective of this study was to relate total length of time CPP fall below threshold 60, 65, and 70 mmHg to outcome at 6 months.

Methods: All SHI patients GCS < 8 on ABP and ICP monitoring are included in this prospective clinical study. Statistical analysis was based on multivariate logistic regression for survival/mortality. The analysis strategy was to first fit a base model regressing outcome on age, gender, GCS and pupil abnormality. The total length of time CPP fall below threshold 60, 65, and 70 mmHg were added to the model to explore the extent to which they improved the predictive ability beyond the base model.

Results: 28 male and 9 female (mean age 44 years) were included in the study. Thirteen had pupillary abnormality. At 6-months follow-up, 27 are alive and 10 dead. By comparing the area under ROC curve for the 3 models, the model with cut-off total length of time CPP < 65 is a better model (highest ROC values = 0.9148) to predict the outcome (GOS = dead).

Conclusion: After statistical control of age, gender, GCS, pupil abnormality, total length of time CPP < 65 predict a worse outcome at 6-months.

I122/SC**The Role of Androgen Therapy in Female Sexual Dysfunction in the Menopause – A Systematic Review**

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Aim: Female sexual dysfunction (FSD) is a common condition affecting postmenopausal women. We reviewed all randomised trials of androgen therapy for sexual function in menopausal women, looking particularly at estrogen-progesterone-androgen, estrogen-androgen, and androgen alone.

Methods: A literature search was done to identify all relevant RCTs. Sources

included MEDLINE, Cochrane Central database and references of published articles. Search terms included estrogen, androgen, menopause, sex behaviour, randomised controlled trial. We found 25 studies involving 20,153 women. Meta-analysis was performed where possible.

Results: There were 7 randomised trials (566 women) comparing estrogen-androgen therapy with estrogen replacement alone and with placebo. Androgen used alone or with ERT increased interest in sex (SMD 0.39, 95% CI 0.10, 0.69), frequency of orgasm (SMD 0.60, 95% CI -0.10, 1.30), sexual satisfaction (SMD 0.16, 95% CI -0.13, 0.46), sexual responsiveness (SMD 0.25, 95% CI -0.05, 0.55). When compared with ERT alone, concomitant use of androgen further improved interest in sex (SMD 0.23, 95% CI 0.01, 0.46), sexual responsiveness (SMD 0.32, 95% CI 0.09, 0.55), frequency of orgasm (SMD 0.24, 95% CI -0.12, 0.60) and general sexual satisfaction (SMD 0.23, 95% CI -0.19, 0.66), while reducing frequency of dyspareunia (SMD -0.34, 95% CI -0.77, 0.08). Androgens did not significantly increase total, HDL or LDL cholesterol levels when compared with placebo.

Conclusion: Evidence suggests that androgen therapy improves sexual function in the menopause, especially when administered with ERT. Lipid profile was not adversely affected. Androgen therapy may be considered for use in menopausal women with sexual dysfunction.

I123/SC

Efficacy of Intravitreal Triamcinolone Injections for Refractory Macular Oedema – Preliminary Results

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Aim: To evaluate the effect of intravitreal triamcinolone acetonide in patients with refractory macular oedema and to assess the clinical side effects of treatment.

Methods: Nine patients (nine eyes) with refractory vasculopathic macular edema associated with diabetes mellitus (n = 6) and central retinal vein occlusion (n = 3) were treated with intravitreal triamcinolone acetonide and followed up for at least 3 months.

Results: Significant reduction in the central macula thickness could be detected both clinically and on Optical Coherence Tomography as early as 1 week post treatment. No significant complications occurred in these 9 injections.

Conclusion: Intravitreal triamcinolone acetonide is safe and well tolerated. Preliminary data showed promising results in clinical and anatomical resolution of macular oedema.

I124/SC

Diabetic Retinopathy Study

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Aim: To determine the degree of severity of diabetic retinopathy at first visit of patients with diabetes mellitus and to study their knowledge, health beliefs and medical risk factors.

Methods: A prospective multi-centred cohort study. The inclusion criterion is every consecutive patient with a medical history of diabetes mellitus seen in eye clinics of 6 public hospitals at first visit or who have defaulted from eye consultation for 1 year or more. Each patient will be interviewed by a trained research assistant. The degree of diabetic retinopathy will be assessed by ophthalmologists and staged according to the criteria from the Early Treatment Diabetic Retinopathy Study.

Results: A total of 923 patients were interviewed. The majority of them (79%) were between 41 and 70 years of age. Eighty-five per cent of all subjects had none or mild non-proliferative diabetic retinopathy and 8% had either severe or proliferative diabetic retinopathy. Only 47% of the entire cohort had heard of diabetic retinopathy and 52% knew the significance of yearly eye screening. Ninety-one per cent of them were non-alcohol drinkers

and 86% were non-smokers. Hypertension and hyperlipidaemia were present in 45% and 32% of them respectively and 11% had underlying heart disease. Only 61% had yearly diabetic photographic eye screening. Thirty-five per cent of the patients screened needed laser treatment and 3% required vitrectomy and laser therapy.

Conclusion: A significant number of patients still presented late on first eye assessment requiring laser or surgical treatment. Diabetic patients need to be better educated with the condition as well as the importance of diabetic eye screening.

I125/SC

Knowledge, Attitude and Perceptions of Current Smokers Attending an Ophthalmology Outpatient Clinic Towards Smoking-Related Diseases – A Preliminary Report

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Aim: Smoking is a modern day epidemic that confers risks of serious illnesses, and its cessation offers health benefits. This study seeks to evaluate the knowledge, awareness and fear of smoking-related diseases among current smokers attending an ophthalmology outpatient clinic to understand their motivation to quit smoking.

Methods: Following a complete eye examination, ophthalmic outpatients who were current smokers were interviewed using a standardised interviewer-administered questionnaire on their knowledge and awareness of smoking-related diseases.

Results: This preliminary report comprised 34 current smokers with a mean age of 66.6 (range, 55 to 80) years. There were 33 male and 1 female smokers. 61.8% were retirees. The visual acuity ranged from 6/6 to no light perception. The proportions of smokers able to attribute specific conditions to smoking were lung cancer (73.5%), other lung diseases (64.7%), heart attack (61.8%), stroke (52.9%), other cancers (50%), and blindness secondary to age-related macular degeneration (41.2%). 38.2% of smokers felt that they would like to prevent and 41.2% felt that they would like to treat heart attack first if it were possible to prevent or treat only one. The same proportion of respondents (17.6%) preferred to treat blindness and lung cancer first.

Conclusion: While most smokers recognise many health hazards of smoking, their awareness of blindness is low. Heart attack is a far greater source of concern than any other illness. Public education efforts to increase the awareness of blindness as a smoking-related disease could potentially help in motivating smokers to quit smoking in antismoking campaigns

I126/SC

Central Corneal Thickness in Singapore Children

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Aim: Little is known about central corneal thickness (CCT) in children. The establishment of normal CCT values in children is important because this aspect of ocular growth is currently not well understood. It may affect interpretation of estimated intraocular pressure (IOP), our understanding of ocular refractive error development and the mechanical properties of the cornea. We aimed to establish the variation of CCT among normal Singapore children.

Methods: Cross-sectional results of 652 right eyes of children aged 9-11 years in the Singapore Cohort Study of the Risk Factors for Myopia (SCORM) were evaluated in a government primary school. CCT was measured using OLCR slit-lamp pachymeter and IOP using non-contact air puff tonometer. Post-cycloplegic refraction and corneal curvature radii were measured using auto-refractometer.

Results: Mean CCT of Singapore children aged 9-11 years was 543.6 μm . The Chinese had thicker mean CCT (546.0 μm) compared to the Malays (539.5 μm) and Indians (532.3 μm) ($P = 0.002$). Boys had thicker CCT ($P = 0.011$). Higher IOP correlated with thicker CCT (Pearson $r = 0.45$, $P < 0.001$). Larger corneal curvature radii weakly correlated with thicker CCT ($P < 0.001$). No relationship was observed between CCT and age, refractive error status and axial length of eyes.

Conclusion: Mean CCT values in Singapore children did not differ greatly from that reported in Singapore adults in the Tanjong Pagar Study. Our results are surprising as another study in Hong Kong Chinese showed a main decline in CCT between age groups 5-15 and 15-25 years. It may be necessary to consider CCT variations when obtaining IOP estimates in children.

I127/SC

Paediatric Epiphora – Is It All Due to Nasolacrimal Duct Obstruction?

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Aim: 1) To identify etiology of epiphora in infancy and childhood 2) To assess efficacy of probing 3) To identify clinical entities presenting as Nasolacrimal Duct Obstruction (NLDO).

Methods: Case notes of 20 children (29 eyes) with epiphora who underwent surgical intervention between April 2000 and April 2004, at Eye Clinic, National University Hospital were retrospectively analysed. The children were in the age group 11 months to 6½ years at intervention. The surgeries were performed by 2 Ophthalmic surgeons trained in Oculoplastics. Glaucoma and surface/lid infection were excluded.

Results: Of 29 eyes, 58.62% ($n = 17$) were watering due solely to typical NLDO. 41.38% ($n = 12$) eyes had other associations causing / contributing. These were: Epiblepharon, Punctal atresia, Common canalicular block, inferior turbinate hypertrophy. 68.95% ($n = 20$) eyes of 15 children warranted Probing alone. Of these, 40% ($n = 8$) were totally relieved. Another 40% ($n = 8$) were partly relieved. Ten per cent ($n = 2$) had persistence of symptoms. Ten per cent were ($n = 2$) lost to follow-up. Additional procedures that were indicated/performed included: Epiblepharon correction - $n = 7$ (24.13%), Infraction of turbinate - $n = 5$ (17.24%), Intubation - $n = 3$ (10.34%), punctoplasty - $n = 2$ (6.89%).

Conclusion: Less than 60% were due entirely to typical NLDO and not even half of Probing procedures were successful in totally relieving the symptoms. So, NLDO should not be presumed as the cause of Epiphora and Nasolacrimal Probe is no magic wand that cures the problem. If a reasonable period of conservative management does not relieve symptoms, Ophthalmic referral is worthy of (NLDO: nasolacrimal duct obstruction).

I128/SC

The Effect of Storage on the Efficacy of Reconstituted Dysport

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Aim: Botulinum toxin type A (BTX-A) (Dysport, Ipsen) labelling recommends its immediate use after reconstitution. As Dysport is available in 500-unit vials, a substantial quantity of this expensive drug is often discarded. With reference to 7 patients with forehead wrinkles, we compare the effect of freshly reconstituted Dysport with Dysport that had been refrigerated (+40°C) for 1 week on the action of frontalis.

Methods: Seven patients with symmetrical forehead wrinkles and who previously responded to Dysport injection of the frontalis were entered into the study. One side was injected with freshly constituted and the other side with reconstituted Dysport that had been stored for 1 week at +40°C. For each subject, an identical amount of Dysport was given to each side (20-40 units to each side). All injections were performed by the same ophthalmologist. The patients were reviewed at 12 weeks and were observed by a blinded independent observer for the excursion of the eyebrows using a ruler (which reflects the strength of the frontalis).

Results: The difference in the amount of eyebrow movement between the 2

sides was not statistically significant ($P < 0.05$). Importantly, there was no adverse effects such as infection from the injections.

Conclusion: Reconstituted Dysport that is subsequently refrigerated for 1 week does not lose its clinical efficacy when used in the treatment of forehead wrinkles.

I129/SC

Lid Contour Abnormality in Levator Advancement and the Location of the Tarsal Plate

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Aim: Lid contour abnormality in the form of peaking is a common cause of dissatisfaction following ptosis surgery. In this study, we look at the effect of the location of tarsal plate suture on peaking.

Methods: In this prospective study, 22 patients undergoing levator advancement are recruited. 11 patients had the tarsal plate suture placed at 4 mm from the superior tarsal border and 11 patients had the tarsal plate suture placed at 6 mm from the superior tarsal border. Any preoperative peaking was recorded and the sutures were then re-sited until no peaking is observed.

Results: Of the 11 patient with tarsal plate suture placed 4 mm from the superior tarsal border, 1 patient had peaking of the lid margin. The peakings were corrected when the sutures were placed nearer the superior tarsal border. Of the 11 patients with tarsal plate suture placed 6 mm from the superior tarsal border, 6 patients had peaking of the lid margin which resolved when the sutures were placed nearer the superior tarsal border. The results were statistically significant.

Conclusion: Peaking of the eyelid is related to the location of the tarsal plate suture. An anteriorly placed suture may lead to an uneven distribution of the force causing peaking. Peaking is less common with suture placed nearer the superior tarsal border.

I130/SC

Visual Experience During Ophthalmic Laser Procedures

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Aim: To describe patients' visual experiences during ophthalmic laser procedures and to determine if they found the visual sensations frightening.

Methods: A post-surgical questionnaire survey was conducted on patients undergoing ophthalmic laser procedures at The Eye Institutes at Tan Tock Seng and Alexandra Hospitals.

Results: One hundred and sixty patients with a mean age of 60.2 years were interviewed. Ninety-one were male (56.9%) and 69 were female (43.1%). There were 126 Chinese (78.8%), 23 Malays (14.4%), 9 Indians (5.6%) and 2 (1.3%) from other ethnic groups. The laser procedures performed were panretinal photocoagulation (50.9%), focal laser (31.9%), grid laser (3.8%), laser retinopexy (3.1%), Nd:YAG posterior capsulotomy (6.9%) and laser peripheral iridotomy (3.1%). Most of the patients experienced light perception during the procedure (98.1%). In addition, patients also experienced a variety of visual sensations such as colours (83.5%), flashes (75%), movement (51.3%), branching patterns of blood vessels (16.3%), the surgeon's hand (14.4%), the surgeon (6.9%), floaters (4.4%) and instruments (3.8%) with their operated eye during the procedure. Nineteen patients (11.9%) found their visual experiences frightening.

Conclusion: The majority of patients undergoing ophthalmic laser procedures experienced at least light perception. The visual experiences were frightening to 11.9% of patients. Counselling patients about the possibility of visual experiences when obtaining informed consent for ophthalmic laser procedures may help alleviate this fear.

I131/SC

A National Cytomegalovirus Retinitis Screening Programme: Evaluation of Enrolment Criteria

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Aim: Our study aimed to assess the pick-up rates of parameters which are used as an indication to initiate a screen for cytomegalovirus (CMV) retinitis in Singapore, to find the optimal combination that maintains a high pick-up rate and reduces the number of screenings required.

Methods: During a 12-month period from April 2001 to March 2002, all HIV patients with any of the following criteria: 1) Visual symptoms, 2) CD4 count <50 cells per microlitre, 3) AIDS defining diseases (ADD) or 4) CMV affecting other parts of the body (CMV elsewhere) were screened for CMV retinitis with both the binocular indirect ophthalmoscope and 9-field digital fundus photography. Various combinations of the above 4 criteria were assessed for their relative importance as enrolment criteria.

Results: During the study period, 153 HIV-positive patients were screened (341 screening visits). Of these, 14 (9.2%) had CMV retinitis. Using a single criteria, the pick-up rate ranged from 0% to 71.4%. With various combinations of 2 of the 4 screening criteria, the pick-up rate ranged from 14.3% to 85.7%. When 3 screening criteria were used, the pick-up rate ranged from 28.6% to 100%. A combination of visual symptoms, CD4 and ADD reduced workload by 5.3% while maintaining 100% pick-up rate.

Conclusion: Using a combination of visual complaints, CD4 count and ADD as criteria for screening, 100% of patients with CMV retinitis can be detected in this study population, while reducing the workload by about 5%.

I132/SC

Comparing Lateral Tarsal Strip Versus Full Thickness Pentagonal Resection In the Management of Involutional Ectropion

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Aim: To compare the results of lateral tarsal strip procedure with full thickness pentagon lid resection in the correction of involutional ectropion.

Methods: A retrospective study of 102 patients who underwent surgery for senile ectropion of lower lid from March 1995 to March 2001. All the patients underwent either lateral tarsal strip operation or full thickness pentagon resection. The following preoperative signs were recorded: site of ectropion, lid laxity and secondary lid margin changes. Success was defined as relief of symptoms and good lid position.

Results: Sixty-nine per cent (70/102) of patients had lateral tarsal strip and 31% (32/102) of patients had full thickness pentagon resection. Overall success was achieved in 90% (63/70) of patients who underwent lateral strip operation and in 90.65% (29/32) of patients with full thickness pentagon resection. However, in patients with medial ectropion (punctal and medial) the success rate was 88.46% (46/52) in lateral tarsal strip procedure compared to 95.65% (22/23) with full thickness pentagon lid resection ($P < 0.05$). In patients with secondary lid margin changes the success rate was 73.91% (17/23) in lateral tarsal strip procedure compared to 86.66% (13/15) with full thickness pentagon resection ($P < 0.05$).

Conclusion: Both lateral tarsal strip and pentagon resection are effective in the treatment of involutional lower lid ectropion. However, in patients with medial ectropion and those with secondary lid margin changes, full thickness pentagon resection gives a higher success rate than lateral tarsal strip operation.

I133/SC

Management of Epiphora with Botulinum Toxin A

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Aim: Epiphora secondary to outflow obstruction is best treated surgically. However, not all patients are suitable for surgical intervention. The study looked at the effectiveness of lacrimal gland injection with Botulinum Toxin A as an alternative to surgery in controlling symptomatic epiphora.

Methods: Ten patients who had epiphora secondary to outflow obstruction were recruited for the study. All patients declined surgical intervention but found the epiphora troublesome. Informed consent was obtained for Botulinum Toxin A injection into the lacrimal gland. All patients had baseline measurements including Schirmer's test and marginal reflex distance

measurement. All received 10 units of Botulinum Toxin A injected transconjunctivally into the lacrimal gland.

Results: All patients reported a subjective improvement in their symptoms. Two patients suffered ptosis. One patient declined further injection. Eight patients experienced no side effects and found the treatment acceptable

Conclusion: Botulinum Toxin A injection into the lacrimal gland can be used as an alternative to surgery in patients with epiphora secondary to outflow obstruction.

I134/SC

Reconstruction of Large Lower Eyelid Defect with Mid Lift and Hughes' Tarso Flap

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Aim: The reconstruction of large lower eyelid full-thickness defect poses a challenge. The Hughes' procedure (tarso-conjunctival flap) has been used as a staged reconstructive surgery for the posterior lamella; with the anterior lamella often being reconstructed with full-thickness skin graft.

Methods: We describe the use of mid-face lift as an alternative in anterior lamellar reconstruction. A patient with squamous cell carcinoma of the lower eyelid had an 80% full-thickness defect after resection with frozen section monitoring.

Results: The posterior lamella reconstruction is achieved using the Hughes' procedure, while the anterior lamella, because of the huge skin defect, was managed with a mid-face lift to achieve the desired amount of flap advancement. The tissues over the temple and cheek are reliable sources for flap reconstruction of the lower eyelid. This technique proves to be ideal with the advantages of good skin colour match, excellent blood supply and survival (as compared to free skin grafts) and avoiding skin graft harvesting with donor site morbidity. The remaining orbicularis oculi in the midface enables the reconstructed lower eyelid to retain some function and close, in addition to the excellent aesthetic outcome.

Conclusion: The reconstruction of large full-thickness defects of the lower eyelid after tumor resection poses a challenging problem. This technique adds to armamentarium of surgical options for the reconstruction of large lower eyelid defects.

I135/SC

Measurement of Compartmental Pressures in Gluteal Compartment Syndrome

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Aim: Gluteal compartment syndromes are rare but potentially debilitating. The proximity of the sciatic nerve to the gluteal compartment makes it liable to injury. Thus early recognition and management are essential. There are a few case reports of this in literature but methods to measure pressures in the different gluteal compartments have not been described.

Methods: The anatomy of the gluteal compartments were studied in cadaveric specimens. Using an injectable colour dye, the compartments were distended and their extent studied. Using as control 1 side, the other buttock of the cadaveric specimen was used to inject dye into the various compartments and study them. The exact position and depth of needle placement for measurement of pressures in each of the gluteal compartments was recorded.

Results: The gluteal region consists of 3 well-defined compartments – the tensor fascia lata, the gluteus medius and minimus and the gluteus maximus. Each of these compartments are enclosed in a nondistensible osseofascial sheath. The sciatic nerve lies in between the gluteus medius and minimus compartment and short external rotators of the hip. Measuring the compartmental pressures in each of these compartments needs precise needle placement. The correct placement of the transducer needle used for measuring compartmental pressures for the 3 compartments will be discussed. A case presenting with bilateral gluteal compartment syndrome will also be discussed.

Conclusion: Recognition of gluteal compartment syndrome, methods of measurement of pressures in the gluteal compartment, relevant anatomy and the management options will be presented.

I136/SC**Is Computer Total Knee Arthroplasty More Accurate Than Standard Instrumentation Results of a Prospective Randomised Trial?**

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Aim: Computer navigation has been advocated in total knee arthroplasty (TKA) to improve the overall accuracy and consistency of the postoperative limb alignment and positioning of the prosthesis. We conducted a prospective randomised controlled trial to verify this.

Methods: Ninety patients requiring TKA were randomised into 3 groups to compare the results between 1) intra-medullary femoral and tibial instrumentation (IM group), 2) intra-medullary femoral but extra-medullary tibial instrumentation (EM) and 3) Computer assisted navigated system (CA). Both clinical and radiological assessments including long leg films were made by a single independent reviewer and results compared with ANOVA test.

Results: The mean hip-knee-ankle angle is 3.1° varus for the IM group, 2.7° varus for EM and 1.5° varus for CA ($P = 0.013$). Both femoral and tibial alignment is also significantly better ($P = 0.004$). Similar findings are found when comparing femoral component flexion and posterior slope of the tibial component. The total postoperative drainage is also significantly lower in CA group ($P = 0.046$). The drop in haemoglobin level is also the least in the CA but this is not statistically significant ($P = 0.17$). However, the tourniquet time is 28 minutes longer in the CA group.

Conclusion: Computer assisted navigation system can improve the overall alignment and consistency of the radiographic results even in the hands of experienced surgeons. Additional benefits like reduced postoperative drainage are also observed.

I137/SC**Early Experience in Free Tissue Transfer in Head and Neck Reconstruction**CMLIM¹, J LIM², KSL TAN¹*¹Department of Otolaryngology—Head and Neck Surgery, National University Hospital, Singapore, ²Department of Surgery, National University Hospital, Singapore*

Aim: The aim of this study is to retrospectively review our early experience with free tissue transfer in the reconstruction of head and neck defects following extirpation of head and neck cancers in a tertiary hospital in Singapore.

Methods: Medical records of patients were traced and a total of 25 patients had undergone free tissue transfer between June 1998 and October 2003. An overall descriptive analysis was carried out looking at the following outcome measures: length of hospitalisation, duration of ICU stay, readmission and complication rate.

Results: There were 18 free radial forearm flaps, 4 rectus abdominis flap 2 free fibular osteocutaneous flaps and 1 free lateral arm flap. The mean length of stay was 12.6 days (SD 7.3) and mean stay in ICU was 1.8 days (SD 1.3). Two patients (8.3%) were readmitted within a 30-day period for flap related complications. Six patients (24%) developed flap related complications. Two patients developed pharyngocutaneous fistula, 3 patients developed flap venous congestion and 1 patient developed minor donor site haematoma. Salvage anastomotic revision was performed in all the 3 congested flaps and 1 of the flaps was successfully revived while the other 2 flaps were lost. Hence, our flap success rate was 92%.

Conclusion: Our early experience shows that free tissue transfer can be a safe surgical option in the reconstruction of head and neck defects. We believe that our initial success will further improve with increase in experience and technical skills.

I138/SC**Role of Fine Needle Aspiration Cytology in Parotid Gland Masses**CMLIM¹, J THAY², KSL TAN¹*¹Department of Otolaryngology—Head and Neck Surgery, National University Hospital, Singapore, ²Medical, Faculty of Medicine, National University of Singapore, Singapore*

Aim: The objective of the study is to evaluate the accuracy of fine needle aspiration cytology (FNAC) in the diagnosis of parotid masses.

Methods: A retrospective review was conducted to examine the clinical records of patients who underwent parotidectomies between January 1997 and April 2004 in the Department of Otolaryngology-Head and Neck Surgery at the National University Hospital, Singapore. A total of 99 patients were found and 91 patients had preoperative FNAC which comprised our study population. The preoperative cytologic and final histologic results were correspondingly analysed.

Results: Histological diagnosis revealed 10 (11.0%) malignant tumours, 74 (81.3%) benign tumours and 7 (7.7%) non-neoplastic lesions. Cytology was non-diagnostic in 10 cases (11%). The overall accuracy for FNAC was 93.8% (76/81). Sensitivity and specificity for diagnosing malignant and benign tumours were 80%, 100% and 98.5%, 87.5% respectively. 83.7% (62/74) of benign tumours were accurately typed on FNAC. However, only 30% (3/10) of all malignant tumours were accurately typed.

Conclusion: FNAC is useful in the preoperative assessment of parotid tumours. Although it may not accurately type the malignant tumours, the preoperative diagnosis of malignant tumours may allow for appropriate surgical planning for the surgeon.

I139/SC**Accuracy of Intraoperative Frozen Section Evaluation in Salivary Gland Surgery**

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Aim: Intraoperative frozen section evaluation of salivary gland tumours is an important tool in determining the extent of surgery. Frozen section results have been reported to be very accurate for benign tumours, though less so for malignant ones. We review our experience.

Methods: Retrospective analysis of all salivary operations done over 3 years in the Department of Otorhinolaryngology, Tan Tock Seng Hospital.

Results: Between July 2001 and June 2004, 91 patients underwent salivary gland surgery in our department. Of these, 77 had frozen sections done, of which 53 had benign tumours, 11 had malignant epithelial tumours, 4 had lymphoid lesions and 9 had non-neoplastic conditions. Of the 11 epithelial malignancies, the accuracy of frozen section was 45.5%. There were 3 incorrect diagnoses of a benign tumour, and 3 deferred diagnoses. Two of the false negatives had a clinical impact, requiring a second procedure. Of the benign tumours, 51 of 53 were correctly identified giving an accuracy of 96.2%.

Conclusion: Frozen section evaluation is highly accurate for benign tumours of the salivary glands. However, for salivary malignancies, frozen section sensitivity and specificity is below 50%.

I140/SC**Extended Radical Neck Dissection in Nasopharyngeal Carcinoma**

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Aim: Radical neck dissection (RND) is the treatment of choice for isolated neck recurrences following radiotherapy for nasopharyngeal carcinoma (NPC). With this approach, the historical regional control and cure rates are good. However advanced neck recurrences require major extension of the classic RND for extirpation. Whether this extended surgery, with its greater morbidity, achieves meaningful neck control and survival is uncertain. We review our experience with extended RNDs for NPC.

Methods: Between March 1995 and March 2004, 11 of 29 patients who underwent neck dissection for nodal recurrence in NPC required extended RNDs. These extensions included the resection of adjacent muscle, cranial nerves, parotid gland, ear canal and temporal bone, spinous processes, skin and the external carotid artery in various combinations. Four patients required myocutaneous flaps for coverage. Five patients received additional adjuvant radiotherapy postoperatively.

Results: After a mean follow-up of 17 months, only 1 of 10 analysable patients (10%) developed neck recurrence. Six patients are presently alive and disease-free, 3 have died of disease and 2 have died of other causes. The actuarial 3 year disease-free survival is 36.7%. This is comparable to

historical data for classic RNDs employed for more limited neck recurrences.

Conclusion: The local control and survival achieved by extended RND for advanced neck recurrences in NPC is encouraging. While extended surgery undoubtedly increases treatment morbidity, the ability to control advanced disease makes this approach worthwhile.

I141/SC

Diagnosis of Residual and Recurrent Neck Disease in Nasopharyngeal Carcinoma

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Aim: Following radical radiotherapy for nasopharyngeal carcinoma (NPC), diagnosing residual or recurrent neck disease can be difficult. Patients with complete resolution of nodal disease may later relapse in the neck. Conversely, patients with clinical or radiological evidence of persistent or recurrent neck disease may not have viable tumour on neck dissection. Computer tomography (CT) scans and fine needle aspiration cytology (FNAC) are frequently used to aid diagnosis of residual or recurrent neck disease. We review our experience with these investigations.

Methods: Between March 1995 and March 2004, 29 patients with previously treated NPC underwent neck dissection for nodal disease, 12 patients for residual disease and 17 patients for recurrent disease. We reviewed their pre-operative imaging and cytology results and compared them with the final histopathology.

Results: Five of 12 (41.7%) patients with residual nodes, and 10 of 17 (58.8%) patients with recurrent nodes had viable tumour on histology. FNAC results correlated poorly with final histology, with false positive and negative rates 25% and 100% for recurrent cases, and 50% and 40% for residual cases respectively. CT scan findings were only slightly more accurate. For recurrent cases, the false positive rate was 22%, while the false negative rate was 33%. For residual cases, the false positive rate was 55%.

Conclusion: The usefulness of CT scans and FNAC in diagnosing residual and recurrent neck disease in NPC is suspect. There is a need to evaluate the accuracy of newer investigations like positron emission tomography (PET) scans in these difficult situations.

I142/SC

Phase II Study of the American Brachytherapy Society Guidelines for the Use of High Dose Rate Brachytherapy in the Treatment of Cervical Carcinoma Implementation in an Asian Society

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Aim: In 2000, the American Brachytherapy Society (ABS) published incompletely evaluated guidelines for curative chemoradiation and high dose rate (HDR) brachytherapy for cervical cancer: our aim was to assess guideline tolerability in an Asian population.

Methods: From 2000, all stage I-IVa cervical carcinoma patients were treated following ABS guidelines. Early disease (FIGO stage I/II

Results: Nineteen of 21 (90%) patients (8 early, 13 advanced stage) received planned radiation, and 86% received planned chemotherapy. Median follow up was 18 months (range, 5 to 43 months). Two-year actuarial survival (S) was 81% and disease free survival (DFS) 76%. S/DFS for early and advanced stage was 88%/86% and 77%/60% respectively. Eighty-six per cent achieved a complete response (CR), 14% partial response. For those in CR, there were no local failures. Acute cystitis occurred in 24%, proctitis 5%, and gastroenteritis 48%. Late cystitis occurred in 10%, gastroenteritis 5%, and genitourinary fistula (in the presence of progressive disease) in 5%. No grade 3/4 treatment-related toxicity occurred.

Conclusion: The ABS guidelines were well-tolerated and efficacious in our study, although longer follow-up is required. Further studies are warranted to validate safety and efficacy of the recommendations.

I143/SC

Prospective Phase II Trial of Concomitant Boost Radiotherapy for Stage II Nasopharyngeal Carcinoma an Evaluation of Response And Toxicity

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Aim: Stage II nasopharyngeal carcinoma (NPC) treated with conventionally fractionated radiotherapy results in loco-regional control of around 80%. This report aims to document the outcome of Stage II NPC patients treated with external beam radiotherapy delivered using an accelerated concomitant boost (C-boost) schedule.

Methods: Twenty-five 1997 UICC TNM Stage II NPC patients were enrolled and analysed in this report. The primary tumor and clinically involved nodes received a total dose of 72 Gy in 42 fractions. C-boost for gross disease consisted of 18 Gy in 12 fractions commencing on day 19, and delivered at least 6 hours after the first dose. Patients were assessed for treatment response, survival and toxicity.

Results: With a median follow-up of 24 months, only 1 patient had pathologically confirmed local recurrence, necessitating IMRT. Two patients developed distant metastases for which they received chemotherapy. One patient died from systemic disease after refusing treatment for persistent neck lymphadenopathy. The 2-year loco-regional control rate, overall survival and disease-free survival rates were 96%, 96%, and 88% respectively. All patients experienced some degree of treatment-related acute and/or late toxicity. However, the toxicity profile was comparable to that seen following standard fractionation. Acute or late toxicities directly attributable to C-boost were not observed.

Conclusion: This concomitant boost radiotherapy regimen administers a substantially higher biologically effective dose compared with conventional radiation schedules. Preliminary loco-regional control and survival rates are promising with no significant acute and/or late toxicities.

I144/SC

Correlation Between Decreased Intracranial Pressure After Mannitol Administration and Improved Brain Oxygenation

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Aim: To analyse changes in PtiO₂ and ICP in patients with acute brain injury. Obtain correlation between stable decrease in ICP (≥ 30 minutes) following mannitol administration and corresponding changes in brain oxygenation.

Methods: We studied 57 mannitol administrations in 17 patients with severe head injury. These patients had intraparenchymal ICP monitor and Neurotrend inserted via a multi-lumen bolt. ICP and O₂ point values were extracted on a 5-seconds time interval via the multiparameter monitoring probes. For each administration, we studied 5 consecutive 30-minute timeframes and determined their average ICP and O₂ values. The timeframe with the minimum average ICP post-administration along its corresponding O₂ was identified and both values subtracted from baseline references for that sample to obtain ICP and O₂ changes.

Results: We presented the analysis of 35 mannitol administrations, mean age 44 years, median GCS on admission = 10, mean baseline ICP = 21.479 mmHg, mean baseline O₂ = 33.862 mmHg, Mean ICP change = -3.46 mmHg (± 4.089); Mean O₂ change = +2.078 mmHg (± 10.079). We compared ICP and O₂ changes using Pearson's correlation coefficient, to obtain $r = 0.615$, significant level at 0.01 (2-tailed). 18 samples with baseline ICP 20 mmHg, $r = -0.583$ significant level at 0.05 (2-tailed).

Conclusion: The study shows moderate to good relationship ($-0.5 < r < -0.75$) between decreased ICP and increased brain O₂ values following mannitol administration irrespective of baseline ICP, suggesting mannitol has the physiological effect of decreasing ICP and the potential of improving brain oxygenation.

I145/SC

The Patients' Perspective and Attitudes Towards Nipple Reconstruction

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Aim: Nipple reconstruction (NR) remains the most common part of post-mastectomy reconstruction. To evaluate 1) Patients' motivations to undergo NR. 2) Patients' attitudes toward NR.

Methods: Fifty-two patients treated in the plastic surgery unit (National University Hospital, Singapore) following breast reconstruction were contacted through telephone. Thirty-nine responded, 1 rejected and 12 were non-contactable. The subjects stated their main motivations/disincentives towards undergoing NR. Questions that make up the attitude score (AC) include aspects such as self-esteem, physical relationship, economic concerns, necessity of procedure and pain.

Results: 1. Group A (14 responded subjects who had undergone, or are going to do NR) – 5 regarded “wanted to have a complete breast” as the main motivation; followed by “doctor’s influence” (4), “no particular reason” (3) and “no harm trying” (2). 2. Group B (25 responded subjects who had not undergone, or did not intend to undergo NR) – 10 regarded “not a necessary operation/does not see the need” as the main disincentive; followed by “does not want another operation” (7), “current body condition does not allow for surgery” (4), and others (3). 3. Group A’s average AC was 15.8/20, while group B’s was 12.2/20.

Conclusion: 1. The main reason for NR was “wanted to have a complete breast”. 2. Group A subjects generally believe NR improves self-esteem and physical relationship with partner. 3. Questioning the need and necessity for NR was the main disincentive in group B subjects. 4. Group B subjects generally believe NR wastes money, is not worth the time or effort, causes further pain and is unnecessary.

I146/SC

Body Image Concerns of Asian Women After Mastectomy and Breast Reconstruction

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Aim: Breast cancer is one of the most common cancers in women. The psychosocial impact of breast reconstruction is extensively studied in the Western population. There is a relative paucity of comparable data in Asian women. Body image has been a key determinant of psychosocial health. AIM: To assess body image concerns of Asian women after mastectomy and breast reconstruction.

Methods: Fifty-three patients from the period of July 1999 to December 2003 who had undergone mastectomy and breast reconstruction in National University Hospital were followed up. Exclusion criteria are: 1. Not of Asian heritage (1); 2. Deceased (1). Of the 53, 2 were excluded, 1 rejected and 12 were non-contactable. Of the remaining 38, 30 (78.9%) Chinese, 5 (13.2%) Malay and 3 (7.9%) other Asian heritage (Filipino, Eurasian, Indian). Phone interviews were conducted using a 10-item body image scale (BIS). Each item was evaluated individually and the 10-item scores were summed to produce overall summary scores for each patient (range 0-30). Zero indicates no symptoms/distress and higher scores represent increasing distress.

Results: The average summary score is 6.32. The individual item scores are higher in cognitive items than in behavioural items. Affective items scores are split with “feeling less physically attractive” being highest among the 10 items and “feeling less sexually attractive” the 9th.

Conclusion: 1. On the BIS, Asian women scored lower (average 6.32). 2. Although they are displeased with the physical effects of the treatment, they are not as affected emotionally or behaviourally.

I147/SC

The Role of Empirical Treatment with Antibiotics in Patients with Elevated PSA – A Prospective Cohort Study

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Aim: Patients with elevated serum PSA undergo transrectal ultrasound-guided (TRUS) biopsy of the prostate to exclude prostate cancer. PSA is also elevated in prostatitis and BPH. We evaluate whether an empirical course of

antibiotics would identify patients with prostatitis, for whom TRUS biopsy would be unnecessary.

Methods: This is an ongoing prospective study of men aged 50-75 years, with PSA between 4-100 ng/ml. Patients are given a 4-week course of antibiotics followed by repeat PSA measurement before TRUS biopsy. PSA decline is significant if it exceeds biological variation of 15%.

Results: Ninety patients have completed the study. Mean age was 64 years, and median baseline PSA was 7.9 ng/mL. Thirteen prostate cancers were detected. The median baseline PSA of patients with and without prostate cancer was 7.8 and 7.9 ng/ml respectively. The median PSA change of patients with and without prostate cancer was +6% and -9% respectively; the difference in PSA change was not significant ($P = 0.082$). Thirty (33%) patients had significant PSA decline after antibiotic treatment. This is attributed to treatment of underlying prostatitis; 2 of these patients had concomitant prostate cancer. Sixty (67%) patients had no significant PSA decline; out of which 11 had prostate cancer. The difference in cancer detection rate between both groups was not significant ($P = 0.206$).

Conclusion: There is no role for empirical antibiotic treatment to differentiate patients with and without prostate cancer. Patients with elevated PSA should be biopsied if clinically indicated.

I148/SC

Testicular Infarction Following Suppurative Epididymo-orchitis: A Persistent Clinical Dilemma

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Aim: Suppurative change with testicular infarction is an extremely rare complication following failed antibiotic therapy for epididymo-orchitis (EO). We report a series of 6 cases diagnosed over a 10-year period.

Methods: Operative records of all non-oncologic orchidectomies performed over a 10-year period from June 1994 to May 2004 were reviewed and correlated with final histological diagnoses. Six cases of testicular infarction following suppurative EO were identified. Clinical records and histological sections were reviewed for presentation, risk factors, histopathological profile, management and prognosis. A PubMed search was performed using key words “infarction”, “necrosis”, “epididymo-orchitis” and relevant articles reviewed.

Results: The mean patient age was 43 (range, 19-76) years. Presenting symptoms include severe scrotal pain and swelling unresponsive to antibiotic therapy. Absence of testicular blood flow and abscess formation was documented on Doppler ultrasonography, and the mean duration from onset of symptoms to diagnosis of threatened testicular viability was 14 (range, 4-90) days. Possible predisposing factors included diabetes (2), end-stage HIV (1) and hypospadias (1). Orchidectomy was performed for 5 of 6 cases at exploration. Gonadal preservation was attempted in 1 case with cord and scrotal decompression, but the patient exhibited delayed infarction requiring subsequent orchidectomy. Microbiology results of responsible pathogens were not available. Postulated mechanisms include lymphatic and venous congestion from severe epididymitis causing vascular compromise and venous thrombosis.

Conclusion: Suppurative change with testicular infarction following EO is a rare but distressing outcome. Early surgical decompression in at-risk patients may improve gonadal salvage.

I149/SC

Mesh Versus Non-repair for Ventral Hernias in the Emergency Setting

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Aim: To compare ventral hernia repair in an emergency setting, with mesh repair versus a non-mesh repair.

Methods: In a comparative retrospective study of 29 patients with ventral hernias in a single tertiary institution over a 6-year period, we analysed their demographics, pre-morbid characteristics, types of hernia and their surgical procedure, the post operation complications and recurrences.

Results: All patients presented with incarcerated ventral hernias. Thirteen patients had emergency hernia mesh repair (group A). Seventeen patients who had non-mesh repair (group B). Twenty-six (90%) of all patients were female. There was no difference in age between the 2 groups (mean age was 63 years). Four patients (23%) of patients in group B had small bowel resection versus 3 patients (25%) of patients in group A. One patient in group A developed a wound haematoma and another developed an infected mesh which required removal of the implant. There was no mortality in this group. In group B, there were no wound-related problems but 1 patient died after she presented late with small bowel infarction and had bowel resection. One patient (8%) in the group A developed recurrence of a hernia as compared to 4 patients (23%) in group B.

Conclusion: Emergency mesh repair for ventral hernias decreases recurrence rates. Selection of their use is important and one may suggest their usage in a non-contaminated environment and when bowel resection is not involved.

I150/SC

Adjuvant Chemoirradiation After D2 Gastrectomy for Gastric Cancer

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Aim: Postoperative adjuvant chemoirradiation has been shown to be effective for gastric cancer in a recent multicentre trial. The role of adjuvant therapy for patients with D2 gastrectomy remains controversial. To determine tolerability of adjuvant chemoirradiation after D2 gastrectomy.

Methods: The data of patients who received chemoradiotherapy following D2 gastrectomy were prospectively collected. The adjuvant treatment consisted Leucovorin 5FU and radiotherapy. The side effects of the adjuvant treatment were measured using the Common Toxicity Criteria.

Results: Between 1 June 2000 and 31 August 2002, 37 patients were subjected to this treatment protocol after D2 gastrectomy. Twenty-nine patients completed the chemoirradiation regime. All patients who could not complete the regime cited the reason of intolerability and half of them occurred in the 5th course. A total of 10 patients were admitted to hospital during the course of chemoirradiation. Gastrointestinal disturbances of diarrhoea and vomiting were the most common side effects (78.4%), of which one patient was admitted. Six patients were admitted for neutropenic fever. Another was admitted after he developed a deep vein thrombosis. No patient developed suffered major toxic effects (grade 3 and above).

Conclusion: Seventy-eight per cent of patients completed the chemoirradiation regime reflecting good tolerability. None of the patients suffered major toxic effects (grade 3 and above). Further studies have to be done to investigate the effect of D2 gastrectomy plus adjuvant chemoradiotherapy on the survival of these patients with resectable adenocarcinoma.

I151/SC

Infrapopliteal Angioplasty in Diabetics for Limb Salvage

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Aim: In the revascularisation of critical ischaemia, femoral-distal bypass has given consistent results in terms of durability and limb salvage. Angioplasty of the tibial vessels has been used as an alternative means of revascularisation and we review our results in terms of efficacy in limb salvage, wound healing and its patency rates.

Methods: All patients admitted to our hospital with the diagnosis of non-healing ulcer with critical ischaemia are entered into a pathway. Ankle and toe pressure indices with duplex ultrasonography were used to reveal the extent of the atherosclerotic disease. Patients were offered angioplasty as a first option with an intent to treat basis. Pre and post procedural ankle indices were monitored. Successful angioplasty was defined as re-establishment of straight line flow from the femoral vessels to at least a single run-off vessel in the foot.

Results: Seventy-two subjects were analysed for this study. Most (76%) of

these patients were diabetic. Seven major amputations were performed giving an immediate limb salvage rate of 90%. There was a mean improvement of ankle pressure indices of 0.23 (SD ± 0.22) in the group where angioplasty was successful. There was a 30-day mortality of 1.4% (1 patient).

Conclusion: Angioplasty offers a viable option for revascularisation in the critically ischaemic limb patient. Short-term patency and limb salvage rates are compatible with distal bypass. There is a tendency for recurrence but frequent re-intervention results in acceptable secondary patency and limb salvage rates.

I152/SC

Gastric Stapling Banding for Morbid Obesity

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Aim: The results of bariatric surgery have been well documented in large series in the West. In Asia, where obesity is less rampant, such surgery has been correspondingly less frequent, and there is a dearth of information on bariatric surgery on Asians.

Methods: This paper documents the outcome of a personal series of 40 patients who underwent gastric stapling and banding from 1987 to 2003 in Singapore.

Results: From 1987 to 1997, 26 patients underwent open gastric stapling [gastric bypass (4), vertical banded gastroplasty (22)]. Initial mean BMI was 43.3 kg/m². At half, 1, 2, 4 and 8 years after surgery, mean BMI was 35.2, 31.9, 31.2, 31.1 and 34.1 kg/m². Mean initial weight was 127.2 kg. % EWL was 42.2, 56.2, 56.9, 56.3 and 48.3%. From 1999 to 2003, 14 patients underwent lap banding, 11 by laparoscopy. Initial mean BMI was 42.9 kg/m². At ½, 1 and 2 years, mean BMI was 38.9, 36.6, and 32.6 kg/m². Mean initial weight was 122.6 kg. Percent EWL was 26.6%, 38.8% and 59.2%. There was no operative mortality. One patient, following perigastric insertion of lap band developed band slippage. We have since adopted the newer technique of combined pars flaccida and perigastric dissection and have had no band slippage in the last 6 patients.

Conclusion: Our results of safety and low operative morbidity as well as pattern and magnitude of weight loss following gastric stapling and banding for morbidly obese patients in Singapore appears to be similar to Western experience.

I153/SC

Laparoscopic Adjustable Gastric Banding: The Singapore Experience

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Aim: The incidence of overweight, obesity and morbid obesity is on the rise in Asian countries. The demand for Bariatric surgery is on the rise as it has been shown to be the only reliable means in effecting weight loss in morbid obesity. We have performed 100 laparoscopic adjustable gastric bandings (LAGBs) to date and are the only group in Singapore with such a wide experience. LAGB is superior to other surgical options in being a purely restrictive surgical procedure.

Methods: The LAGB involves placing an adjustable silicone band in the upper part of the stomach to create a small pouch and the outlet of the pouch can be adjusted via a port buried in the fat. We use the pars flaccida technique.

Results: We have performed 100 LAGBs to date in an Asian populace with BMI >40 and BMI >32.5 with comorbidities. (ASBS, IFSO, INNAME, MOH). Our age range was 26 to 50 (average 36.8) years with a M:F of 5:13 and a conversion rate of 2%. The weight loss ranged between 0.19 and 2.6 kg/week (average 0.78) and the BMI loss was about 0.07-1.12 per week. Selected comorbidities also showed remarkable resolution/improvement such as DM - 20%/80%, Hypertension - 35%/65% and knee pain - 60%/40%.

Conclusion: The Health For Life programme in Alexandra Hospital, Singapore, has estimated the prevalence of BMI >35 requiring bariatric surgical intervention to be approximately 1.6%. The LAGB is a very good surgical option in morbid obesity in the Asian population with minor changes in selection criteria.

I154/SC**Laparoscopic-assisted Colon and Rectal Surgery – Lessons Learnt from Early Experience**

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Aim: Current evidence shows that laparoscopic bowel surgery is associated with significant benefits. We report our early experience in laparoscopic-assisted colorectal procedures in our Colorectal unit.

Methods: All (LAC) procedures performed between January 2000 and December 2003 were reviewed. An equal number of matched open procedures were accrued and analysed for comparison. All patients were managed on a standard carepath. Data was analysed using a statistical software package.

Results: Forty-two LAC procedures were performed. Seven were converted to open for various reasons. LAC procedures performed included 1 right, 5 left hemicolectomies, 9 anterior resections, 1 abdominal-perineal resection, 3 sigmoid colectomies, 11 colostomies and 1 Hartmann's procedure. Mean perioperative time (146 min vs 125 min, $P = 0.173$) was comparatively longer. Mean duration for analgesia (2.25 days vs 2.64 days, $P = 0.05$), mean length of stay (5.31 days vs 9.07 days, $P < 0.05$), mean time to commencement of diet (2.91 days vs 4.05 days, $P < 0.001$) and mean time to first bowel movement (2.57 days vs 4.10 days, $P < 0.001$) were all comparatively shorter. General morbidity rates (17.1% versus 21.4%, $P = 0.35$) were lower. No local wound complications were found in the LAC group. Patients who had procedures converted to the open method fared poorer.

Conclusion: LAC procedures performed in well-selected patients are associated with shorter hospital stay, quicker return of bowel function and less morbidity. Early experience should be acquired from performing technically simple procedures in patients with benign conditions before progressing to oncologic resections.

I155/SC**Advanced Breast Cancer in Malays**

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Aim: To study the characteristics of locally advanced and metastatic breast cancer among local Malays.

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

Results: 622 women were diagnosed with invasive breast cancer in our department from January 2000 to November 2003. 134 patients had locally advanced breast cancer (LABC) or metastatic breast cancer (MBC), and 488 patients had early breast cancer. 524 patients were Chinese, 60 Malays, 25 Indians and 13 others. Malays were found to be 2 times more likely to have either LABC or MBC compared to the other races ($P = 0.024$, OR 1.93). Patient and tumour characteristics between the Malays and Chinese were compared. There was no significant difference in age, menopausal status, parity or family history between the Malays and Chinese. Neither was there any significant difference between tumour histology, size or grade, although the tumours in Malays were 3.6 times more likely to be oestrogen receptor (ER) negative ($P = 0.026$). Tumours found in Malays are therefore not likely to be more aggressive than those found in Chinese.

Conclusion: A lack of awareness and a delay in seeking treatment may account for the more advanced stage at presentation amongst Malays. There is therefore a need to promote a greater awareness among the Malays, to encourage them to perform regular breast self-examination and to seek prompt medical attention when breast symptoms arise.

I156/SC**A Randomised Controlled Trial of Standard Dose BCG Versus Low Dose BCG and Interferon Alpha in Patients with Superficial Bladder Cancer**

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Aim: To determine whether dose reduction of BCG combined with Interferon alpha (IFN α) could reduce toxicity and maintain the efficacy of BCG immunotherapy for bladder cancer.

Methods: 140 patients were recruited for a randomised, controlled double-blind trial comparing standard dose BCG (81 mg) with low dose BCG (27 mg) and low dose BCG (27 mg) with 10 MU IFN α . Patients received 6 weekly intravesical instillations of intravesical therapy, followed by a 6-week rest period before receiving a further 3 instillations. Toxicity symptoms were recorded using linear analog scale. Subjects underwent 3-monthly cystoscopy and urine cytology. Data were analysed using multiple logistic regression, nonparametric tests and Kaplan-Meier recurrence-free plots.

Results: In patients who received low dose BCG, with or without IFN α , there was significantly less fever $>38.5^{\circ}\text{C}$, dysuria, burning sensation, frequency, haematuria and lassitude. Overall, there was a statistically significant 30% reduction in both local and systemic toxicity in the low dose BCG arms. Only 126 patients were evaluable for efficacy analysis. For standard, low dose and combination therapies, the recurrence rates at 12 months and 24 months were 24%, 18% and 13% and 42%, 24% and 15% respectively. The mean time to recurrence was 51, 59 and 66 months respectively. The hazard relative ratio for recurrence in the combination and low dose arms were 0.49 and 0.70 relative to standard dose BCG.

Conclusion: Five-year data suggest that intravesical low dose BCG in combination with IFN α has lower toxicity and may have equivalent, if not superior efficacy compared to standard dose BCG in patients with superficial bladder cancer.

I157/SC**Emphysematous Gastritis – A Case Report and a Review of Literature**

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Aim: Emphysematous gastritis is a severe, rare and unusual form of gastritis caused by infection of stomach wall with gas producing organisms. Predisposing factors are diabetes, alcoholism, corrosive ingestion and in immuno-compromised individuals. We report a case of emphysematous gastritis in a post hepatectomy patient, who responded to conservative management.

Methods: A 45-year-old Chinese lady, known hepatitis B carrier, with Child's A cirrhosis and a hepatocellular carcinoma in the right lobe was referred to our unit. She subsequently underwent a right hepatectomy. On POD 11, she became increasingly septic, jaundiced and encephalopathic. A CT of her abdomen showed the stomach wall to be oedematous, with air pockets within the thickened stomach wall. Cultures from the abdominal drain showed multi-resistant Pseudomonas and Acinetobacter sensitive to meropenem. She was treated conservatively with intravenous meropenem. The patient responded to conservative management and was discharged after 7 weeks.

Results: Emphysematous gastritis was first described by Frankel in 1889, about 15% of cases are in recent post abdominal surgery period. Diagnosis is usually based on the circumstances, clinical presentation and imaging investigations of CT/MRI. Reported mortality is about 60%, though some authors have reported 100% mortality in patients without surgical intervention. Associated perforation is an indication for surgery. Our patient settled on conservative management.

Conclusion: Though there are many advocates for immediate surgery, of recent, there has been a trend towards conservative management.

I158/SC**Evolving Role of Open Nephrectomy in the Age of Laparoscopic Nephrectomy**

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Aim: We analysed the indications for open radical nephrectomy in our institution with a comprehensive laparoscopic programme.

Methods: We reviewed 29 laparoscopic and 15 open radical nephrectomies for renal cell carcinoma from August 2001 to June 2004 with regards to the choice of approach, operating time, length of stay and operative complications.

Results: Comparing open versus laparoscopic groups, median patient age was 62 vs 63 years, average tumour size on preoperative imaging was 9.8 cm vs 5.5 cm, average operating time was 177 min vs 243 min, average blood loss was 860 mL vs 647 mL, and median postoperative length of stay was 6 days vs 3 days respectively. We had 7.1% (2 cases) conversion to open surgery but had no other major morbidities and mortality. Open nephrectomy was performed in 34.1% and the indications were for large tumour (>13 cm) in 4, renal vein tumour thrombus in 4, surgeon preference in 3 (during our early laparoscopic experience), 1 attempted partial nephrectomy, 1 with local invasion of surrounding organs, 1 previous colonic resection with stoma and 1 with large lymph nodes encasing renal hilum.

Conclusion: Despite laparoscopic surgery having become routine at our institution in the past 3 years, open radical nephrectomy retains an important role in up to one-third of patients. The indications for open surgery are evolving as the rate of open surgery may be further reduced with increasing laparoscopic experience, use of intraoperative ultrasonography and acceptance of this relatively new procedure.

I159/SC

Orthotopic Liver Transplant in Patients with Liver Disease Complicated by Portal Vein Thrombosis

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Aim: Portal vein thrombosis (PVT) once considered a contraindication to liver transplant, however with recent advances, does not preclude successful orthotopic liver transplantation. It still has a substantial impact on surgical complexity, perioperative morbidity and mortality. The incidence of PVT ranges from 2% to 13% in reported literature.

Methods: At the National University Hospital, Singapore, we have performed 100 Orthotopic liver transplants since the inception of the programme. We had 1 patient with PVT complicating the liver transplantation procedure. The strategies used at the time of surgery include, A) Thrombectomy of portal vein till the junction of splenic vein (SV) and superior mesenteric vein (SMV) if vein/thrombus are soft. B) Thromboendarterectomy may be needed using endarterectomy spatulas and cannon strippers. C) Eversion endarterectomy is usually needed if the thrombus is organised. D) Distal portal vein only involvement can be managed by excision if recipient portal vein is of adequate length. Precise suturing with intimal approximation and occasional tacking of intimal flaps is mandatory PVT extending beyond the SMV and SV junction do need iliac vein grafts to bridge the portal vein or vena cava, portal vein transposition.

Results: At the National University Hospital, Singapore, we have performed 100 Orthotopic liver transplants since the inception of the programme. One of our patients had portal vein thrombosis adding to the complexity of liver transplantation procedure. Post transplant he did very well and was discharged home on day 17. The delay was due to control of his diabetes and learning curve in his immunosuppression medication.

I160/SC

Necrotising Pancreatitis Management in Concordance with IAP Guideline

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Aim: Introduction: We report a case of acute necrotising pancreatitis with a Ranson's score of 7 and a CT severity index of 9. This patient has a morbidity and mortality rate of as high as 100%.

Methods: 68-year-old Chinese lady presented with gallstone pancreatitis of 1 day duration. She was started on intravenous meropenem. By day 5 she developed SIRS. CT demonstrated near total necrosis of pancreas. She became septic by day 12. Computed tomography on day 16 showed a large infected pseudocyst. Pancreatic debridement and necrosectomy, cholecystectomy and insertion of feeding jejunostomy, were performed on day 20.

Results: The patient had 1 day of ICU stay post operatively. Post operatively

patient had a gradual and unremarkable recovery. Our team managed this case in concordance with most of the recommendations. We feel that following IAP guidelines helped in the successful outcome for our patient, who had high predicted rate of morbidity and mortality.

Conclusion: IAP guidelines are useful and helpful in the management of most patients with severe acute pancreatitis, though individual variations in patient circumstances have to be borne in mind, and treatment modified as appropriate. Imaging, clinical status and clear demarcation of the necrotic pancreatic tissues are better predictors for the need for surgery as also the clinical status of the patient.

I161/SC

Elasticity Imaging of Breast Tumours

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Aim: Some pathological conditions, such as malignant tumours, manifest themselves as changes in the tissue's mechanical stiffness. This is the basis for palpation. Due to increased stiffness, when vibration is applied to tumour-bearing tissue, the movement of the tumour is less than that in the surrounding tissue. Modern ultrasound systems can be used to reveal how tissues move in response to vibrating force. Several techniques for imaging tissue elasticity have been proposed: compression elastography, transient elastography and sonoelastography. Visualisation of elastic properties using ultrasound imaging to display variations in tissue motions is known as sonoelastography.

Methods: A vibration assembly consisting of 3 cm disc driven by an audio-speaker, powered through frequency generator and musical amplifier was used as tissue contact element to induce low frequency sinusoidal oscillations. An ultrasound probe coupled with acoustic gel scanned tissue vibrations under power Doppler mode. Experiments were conducted on breast phantoms and with ethical clearance the breast in patients were also examined using conventional B-mode and sonoelastography, just prior to breast surgery.

Results: In breast phantom, an iso-echoic lesion on B-mode scan showing no detectable contrast with the neighbouring tissue appeared as light coloured region to surrounding bright coloured area on power Doppler scan. *In vivo* different breast lumps revealed varied colour patterns. Some as colour void areas, other as colour filled regions associated with B-mode speckles.

Conclusion: The preliminary findings suggest that our technique could be used as an adjunct imaging method to conventional B-mode scanning for detection and diagnosis of lumps.

I162/SC

Different Endoscopic Approaches in Palmar Hyperhidrosis: A Critical Appraisal

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Aim: The aim of our study was to evaluate the results of thoracoscopic sympathectomy for severe upper limb hyperhidrosis using different surgical techniques: needlescopic, single port techniques and standard 5 mm thoracoscopic surgery (VATS).

Methods: Between May 1996 and December 2003, 90 consecutive patients underwent thoracoscopic sympathectomy procedures to treat bilateral hyperhidrosis (180 procedures). 50 patients underwent needlescopic procedures and 28 patients underwent single port procedure and 12 patients underwent VATS. Operative results, complications, and recurrence were determined by reviews of hospital and office charts and by follow-up assessments in the outpatient clinic.

Results: Ninety patients (52 female, 38 male; mean age, 26.12 years) presented with primary palmar hyperhidrosis. Twenty-eight patients had axillary hyperhidrosis while 26 patients had associated plantar hyperhidrosis as well. The average length of hospitalisation was 1.38 days (1-4 days). At 23.67 months (CI 95%) follow-up: 17 (19%) patients reported bothersome compensatory hyperhidrosis and 2 patients considered it severe. All patients had relief of palmar hyperhidrosis, 94.8% reported good results, and 2.6% reported satisfactory and poor results respectively. All postoperative complications were transient, 2 patients had chest tube inserted for significant pneumothorax and 8 patients had transient subcutaneous emphysema, 2 patients reported persistent chest pains. There was no significant difference

in the hospital stay, analgesia requirements and complications between needlescopic and single port techniques.

Conclusion: Thoracoscopic sympathectomy using a needlescopic and single port techniques effectively treats hyperhidrosis and is associated with short hospital stays, high patient satisfaction rates, and low rates of compensatory hyperhidrosis or other complications.

I163/SC

Endoscopic Totally Extraperitoneal Inguinal Hernia Repair – A Single Centre Experience

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Aim: Laparoscopic hernia surgery has maintained its role because of the benefits to patients that are evident when compared to open repairs, as reported in many published randomised controlled trials. We review our experience of endoscopic totally extraperitoneal hernia repair (TEP) in a major teaching hospital.

Methods: A review was undertaken of 280 consecutive patients who underwent TEP for inguinal hernia between 1998 and 2004 at the National University Hospital, Singapore.

Results: The 280 patients had 350 hernia repairs (234 unilateral and 116 bilateral hernias). The mean age was 51 years and 89% were men. The overall mean operative duration was 70 minutes; bilateral repairs took 27% longer than unilateral repairs. Five patients had conversion to open surgery, and 16 patients developed minor complications (groin seroma). 9 patients (3%) developed hernia recurrence, but there was no recurrence detected in the last pts (52%). The recurrence rate was higher when the mesh was not anchored (5 of 45 patients; 11.1%) than when the mesh was anchored (3 of 235 cases; 1.3%). The mean inpatient hospital stay was 1.4 days, and of the last 96 cases, 70% were performed as outpatient.

Conclusion: Endoscopic TEP is a viable alternative to open hernia repair. To achieve good results, adequate cases should be performed to overcome the learning curve, and that the mesh should be anchored to the inguinal floor.

I164/SC

Laparoscopic Versus Open Ventral Hernia Mesh Repair: A Prospective Study

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Aim: We compared laparoscopic ventral hernia repair against open ventral hernia repair to determine if laparoscopic repair is safe and effective in our setup.

Methods: Data of 71 consecutive patients with ventral hernia mesh repaired by either laparoscopic or open technique from August 2001 to November 2003 were collected.

Results: Open repair was done in 37 patients and 34 had laparoscopic repair. Mean hernia size for the laparoscopic group was 93 cm² versus that for open of 55 cm², mesh sizes 216 cm² versus 110 cm² and mean operating time was 96 minutes versus 116 minutes respectively. A statistically significant difference ($P = 0.002$) was seen between postoperative stay, laparoscopic 2.29 ± 0.97 days versus 3.81 ± 2.55 days in open. Postoperative pain score (VAS) was significantly different at 72 hours ($P = 0.017$). There was no conversion to open repair. In the laparoscopic group 1 patient had seroma and 1 prolonged ileus versus 4 seromas and 5 patients with prolonged ileus in open group. Two patients in the open group 2 required removal of mesh for infection. Mean follow-up time is 11.2 ± 9.81 months for laparoscopic patients versus 13.76 ± 7.54 months for open group. Recurrence rate of 2.94% is noted in the laparoscopic group, as compared to a much higher (10.81%) in the open group.

Conclusion: In our experience, laparoscopic ventral hernia repair is associated with decreased operating time, less postoperative stay, higher patient satisfaction rate, and lesser complications.

I165/SC

A Six-month Review of Ambulatory Surgery in Patients with Breast Cancer in Tan Tock Seng Hospital

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Aim: To evaluate the feasibility and safety of performing simple mastectomy with axillary clearance (SMAC) and wide excision with axillary clearance (WEAC) as ambulatory surgery.

Methods: Medical records of 109 patients who underwent SMAC and WEAC from December 2003 to May 2004 were reviewed retrospectively.

Results: The routine practice in our department has been to admit patients following SMAC or WEAC. In March 2004, our department started a 23-hour ambulatory surgery (AS23) programme. Twenty-nine patients underwent AS23 or day surgery (DS) from December 2003 to May 2004. These patients were discharged with pressure dressing over the wound and a single drain in the axilla. The breast nurse will remove the pressure dressing 2 days postoperatively and remove the drain 6 days postoperatively. The mean age of these patients was 49.5 ± 8.4 years. This was significantly younger than the mean age of patients who stayed as inpatients (57.0 ± 13.1 years). These patients also had less severe co-morbidities. 24.1% of those who underwent ambulatory surgery had a SMAC procedure done as compared to 68.8% of inpatients. A significant number of patients who were admitted for more than 24 hours were from nursing homes or had poor social support. There was no significant increase in local wound complications between the 2 groups.

Conclusion: Younger patients with minimal co-morbidities and good social support are suitable candidates for ambulatory surgery, which can be performed without significant postoperative morbidity.

I166/SC

Laparoscopic Left Hepatectomy Case Report and Review of Literature

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Aim: Laparoscopic surgery has seen major advancement in techniques and refinement in the instruments used, making it now more feasible to explore the place of laparoscopic resection of the liver. We here report a case of a patient with multiple liver adenomatosis in segments 3 and 4, who underwent a successful laparoscopic left hepatectomy for dominant nodule in segment 4.

Methods: A 50-year-old Chinese male presented with left lower limb swelling. Biopsy of lesions suggested high grade sarcoma. Staging CT revealed several lesions in segment 3 and 4 of liver. CT guided biopsy of liver tissue revealed adenoma. He underwent laparoscopic left hepatectomy followed by left below knee amputation.

Results: The patient had a rapid postoperative recovery. He was ambulatory with assistance on postoperative day 1. On postoperative day 4, he was discharged home.

Conclusion: Laparoscopic hepatectomy is a safe and feasible operation with careful patient selection. Besides a reduced postoperative analgesic requirement, shorter time interval to oral intake and reduced hospital stay, there is a faster improvement in the serum transaminase levels post operatively. Localisation of the lesions is of crucial importance and peripheral lesions in segment II-IV are more feasible for laparoscopic approach for resection. With experience, more cases and more complex lesions can be offered laparoscopic hepatectomy.

I167/SC

Evaluation of Renal Vasculature for Living Renal Donors – Comparing Computed Tomographic Angiography with Conventional Angiography

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Aim: To compare the reliability and accuracy of multi-sliced contrast enhanced computed tomographic angiogram (CT) to that of conventional angiogram (Angio) in detecting vascular abnormalities in living renal donors who had undergone transplant nephrectomy.

Methods: From January 2000 to April 2004, operation was performed in 33 renal donors. Prior to nephrectomy 10 had CT and 23 had Angio. Comparisons

were made between intraoperative findings to the CT or Angio findings. Cost benefit analysis was done.

Results: Of the 10 patients who had CT, 6 were reported as normal and 4 had minor abnormalities that should not preclude graft nephrectomy. Intra-operatively 1 of the 6 with normal CT had minor vascular abnormalities detected that did not preclude graft nephrectomy. Of the 4 with abnormal CT, no additional findings were noted and graft nephrectomy was performed. Of the 23 patients who had angiograms, all were normal. Intra-operatively no abnormalities were detected in 17 patients (74%) and 6 were abnormal (26%). Of the 6 who were abnormal, none were considered to be major. One of the donors did not undergo donor nephrectomy due to structural abnormalities of both kidneys that was not detected on the intravenous urogram. One patient underwent an asthmatic attack following the Angio.

Conclusion: CT is at least equal to, if not better than Angio for pre-operative vascular evaluation of living renal donors. It has advantages of less invasiveness, cost savings, lower morbidity and increased level of renal assessment.

I168/SC

Management of Stricture Urethra

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Aim: We determined whether optical urethral reconstruction is effective for the treatment of urethral stricture. All patients with stricture urethra were subjected to optical urethrotomy and its mid-term outcome was analysed

Methods: During a 3-year period 192 men underwent total of 322 urethrotomies. Seventy-nine lesions were in the bulbar urethra, 21 in the posterior and whole urethra was involved in 17 cases. Sixty-four were in anterior urethra and in the rest of the 11 cases site was not mentioned. Guided optical urethral reconstruction consisted of optical urethrotomy performed with a metallic bougie introduced proximally through the suprapubic catheter site and into the proximal urethra with the index finger of the operator in the rectum in a few cases.

Results: Of the patients 112 (59%) were cured after 1 procedure, whereas another 33 (17.1%) required 2 procedures. The remaining 32 (16.5%) patients required 1 to 6 urethrotomies (mean 4) except 1, who required 9, 6 patients underwent urethroplasty, 3 endoscopic rail road and 6 patients lost to follow up. Hematuria occurred in 2 of the patients, extravasation of urine in 2, and 2 patients developed urethrorectal fistula, 1 heals spontaneously.

Conclusion: Our procedure is effective, simple, safe, does not require special or sophisticated guiding instruments, which are necessary for previously described techniques. It can be performed with or without use of a bougie depending on the extent of the lesion and skill of the surgeon. The outcome can be judged from the symptomatic response of the patient, and flow studies and urethrography are not mandatory during routine follow-up.

I169/SC

Post Polymerisation Shrinkage Associated with Different Light-Curing Regimens

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Aim: Polymerisation shrinkage has been an inherent problem in modern composites. This study was designed to establish any significant differences post-gel polymerization shrinkage associated with different light-curing regimens of similar light energy density.

Methods: A light-cure unit (VIP, Bisco) that allowed for independent command over time and intensity was used. The 5 regimens investigated were pulse delay (PD), soft-start (SS); pulse cure (PC), turbo cure (TC) and standard continuous cure (C) [control]. With the exception of TC, light energy density for all curing regimens was fixed at 16 J/cm². A strain-monitoring device and test configuration was used to measure the linear polymerisation shrinkage of 2 mm thick composite specimens (Z100, 3M ESPE) during and post light polymerisation up to 60 minutes. Five samples were made for each curing mode.

Results: Post-gel shrinkage ranged from 0.30% to 0.46% at 60 minutes. The use of PD resulted in significantly lower shrinkage compared to PC, TC, SS

and C. Shrinkage associated with SS was in general significantly lower than C. No significant difference in shrinkage was observed between PC, TC and C at all time intervals.

Conclusion: The use of pulse delay and soft-start regimens significantly decreased post-gel polymerisation shrinkage when compared to standard continuous cure.

I170/SC

Effectiveness of Composite Cure Associated with Different Light-Curing Regimes

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Aim: Effectiveness of composite cure is vital as the physico-mechanical properties of the restoration depend on it. Total light energy rather than light intensity alone influences the polymerisation process. Our study compared the influence of 5 different curing profiles with a standardised light energy density on the effectiveness of composite cure.

Methods: A light-cure unit (VIP, Bisco) that allowed for independent command over time and intensity was used. The 5 regimens investigated were pulse delay (PD), soft-start (SS); pulse cure (PC), turbo cure (TC) and standard continuous cure (C) [control]. Light energy density for all curing regimens was fixed at 16 J/cm². Effectiveness of cure was established by measuring top and bottom Knoop hardness of 2 mm thick composite specimens (Z100, 3MESPE) using a digital microhardness tester immediately and at 1-day post-polymerisation. Five samples were made for each curing regimen.

Results: Top KHN observed immediately after polymerisation with C was significantly lower than that of PD. At 1 day post-polymerisation, the top KHN obtained with C was significantly lower than that of PD, SS, and T. No significant difference in bottom KHN was observed between the different curing modes immediately after curing. At 1 day post-polymerisation, the bottom KHN obtained with C was significantly lower than that of SS and T.

Conclusion: Effectiveness of cure at the bottom surfaces of composites may be increased by soft-start and turbo polymerisation regimens.

I171/SC

Surgical Management of Non-cirrhotic Portal Hypertension – A Study of 25 Cases

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Aim: Non-Cirrhotic Portal Hypertension (NCPHT) is described as an increase in portal pressure in the absence of cirrhosis. The distinction into cirrhotic and non-cirrhotic varieties is important as the latter carries a better prognosis due to the relatively normal hepatocellular function. Our aim was to find the common causes and presentations of NCPHT, indications for surgery and their results.

Methods: Between 1990 and 1997 we analysed 25 consecutive patients undergoing surgery for NCPHT. All patients underwent an ultrasound, percutaneous liver biopsy and splenoportogram. The modified Child-Pugh grading criteria was used to assess liver function.

Results: Thirteen patients had extra-hepatic portal vein obstruction (EHPVO) with no underlying cause. 11 patients had non-cirrhotic portal fibrosis (NCPF) and 1 had congenital hepatic fibrosis. Upper GI bleed and splenomegaly was present in all but ascites in only 32% of cases. Seventeen patients underwent surgery due to failure of endoscopic sclerotherapy. The remaining 8 patients selected surgery as a 1-time therapy. Fourteen patients underwent a selective portosystemic shunt and the remaining 11 had devascularisation surgery.

Conclusion: Surgery for NCPHT is indicated in cases where sclerotherapy fails or for patient preference for a 1-time procedure. The distal splenorenal shunt is the best procedure if the anatomy is suitable. Devascularisation procedures should be considered only if selective shunts are not feasible. NCPF and EHPVO are by far the 2 most important causes of NCPHT in our setting. Their aetiology remains elusive and is a matter for further research.

I172/SC

Cardiac Time Intervals of Normal Fetuses Using Non-invasive Fetal ElectrocardiographyE CHIA¹, TF HO¹, M RAUFF², W YIP³¹Physiology, Faculty of Medicine, National University of Singapore, Singapore, ²Department of Obstetrics and Gynaecology, National University Hospital, Singapore, ³Department of Paediatrics, Gleneagles Hospital, Singapore**Aim:** To evaluate the various fetal cardiac time intervals from the longitudinal analysis of fetal electrocardiography (fECG) in normal pregnancies. Such normative information will be useful for clinical application in the assessment of fetuses with suspected cardiac diseases or dysrhythmias.**Methods:** Cardiac time intervals are derived from fetal electrocardiograms obtained non-invasively via maternal abdominal electrodes from the 18th week of gestation onwards. The variables measured included the durations of the P wave, PR interval, QRS complex, QT interval and T wave, which were plotted against gestational age.**Results:** Linear regression analysis identified a strong dependency of the durations of P wave, PR interval, QRS complex, QT interval and T wave on fetal gestational age. The mean P wave duration increased from 43.9 ms at 18 to 22 weeks of gestation to 52.9 ms at ≥ 37 weeks ($P < 0.001$). PR intervals were 102.1 ms and 110.1 ms, for foetuses at 18-22 and ≥ 37 weeks ($P < 0.001$), respectively. QRS intervals were 47.4 ms and 51.5 ms ($P = 0.004$), QT intervals were 224.0 ms and 242.7 ms ($P < 0.001$), while T wave durations were 123.8 ms and 152.4 ms ($P < 0.001$), for foetuses at 18-22 and ≥ 37 weeks, respectively.**Conclusion:** This study demonstrates the use of non-invasive fECG monitoring in pregnancy, and provides data on normal fECG cardiac time intervals from 18 to 41 weeks of gestation. These intervals are useful as reference values for the detection of abnormal changes in circumstances where fetal arrhythmias, IUGR and congenital heart defects may occur.

I173/SC

Oral Self-care, Practices and Attitudes of Diabetics in SingaporeHM HTOON¹, LP LIM², CF SUM³, FBK TAY⁴¹Preventive Dentistry, Faculty of Dentistry, National University of Singapore, Singapore, ²Department of Preventive Dentistry, Faculty of Dentistry, National University of Singapore, Singapore, ³Diabetics Department, Alexandra Hospital, Singapore, ⁴Department of Dental Service, Alexandra Hospital, Singapore**Aim:** Diabetes is one of the risk factors in periodontal disease. With the high prevalence of diabetes in Singapore adults, there is no available data on the oral health behaviour of diabetics in the local context. The aim of the study is to find out the oral health attitudes and practices of adult diabetics receiving medical treatment at a diabetic centre**Methods:** A questionnaire survey together with clinical and laboratory parameters were conducted to profile the diabetic patients from a hospital-based Diabetic centre as part of a larger scale study. One hundred and twelve adult diabetics aged 21 to 65 years responded to questionnaires relating to oral self-care, attitudes and practices (15 items) and diabetic conditions (12 items).**Results:** The majority of patients were compliant in their diabetic control. More than two-thirds of diabetics did not visit a dentist annually as well as did not know or were informed that they were at high risk for periodontal disease ($P < 0.05$). Most patients claimed to be brushing regularly (99.1%); interdental cleaning was not practised by a marginal majority (50.5%). Only 9.3% of participants had acceptable level of knowledge on periodontal health ($P < 0.001$) and ability to detect gum disease was also low at 25%**Conclusion:** A preliminary study of diabetics showed that the majority of diabetics have low periodontal health awareness, infrequent dental visits and interdental cleaning behaviour. The findings highlight a need to promote oral health as part of the overall component of medical healthcare for patients with diabetes.

I174/SL

Alveolar Osteoblasts Growth and Function on 3 PCL Scaffolds In VitroYF ZHOU¹, AM CHOU², ZM LI³, V SAE-LIM³, DW HUTMACHER⁴, TM LIM⁵¹Biological Science, National University of Singapore, China, ²Bioengineering, National University of Singapore, Singapore, ³Department Restorative Dentistry, National University Hospital, Singapore, ⁴Department of Orthopaedic Surgery, National University Hospital, Singapore, ⁵Biological science, National University of Singapore, Singapore**Aim:** Most studies on alveolar osteoblasts (AOs) were based on 2-dimensional cultures; little knowledge is available on 3-dimensional cultures. In this study, we investigated AOs proliferation and differentiation on the PCL-TCP (80:20) scaffolds in vitro, mimicking the *in vivo* bone matrix.**Methods:** Proliferations of AOs on the scaffolds were assayed through DNA synthesis rate and the differentiation processes were monitored at both RNA and protein level by RT-PCR and western blots techniques as well as histology.**Results:** AOs finished attachment on scaffolds in 2 hours and, after 28 days; cells evenly distributed and formed multilayers cells and collagen fibers inside the scaffolds. Culture on TCP-PCL scaffolds exhibited significant influence on the expression pattern of AP activity and osteo-related biomarkers osteopontin (OPN), osterix as well as collagen type I (Col I) compared to the petri dish culture. OCN, a specific mature osteoblasts marker, expression level of AOs on scaffolds was 30% to 80% higher than that on petri dish. Osteogenic induction (Dex, ascorbic acid and glycerophosphate) down-regulated OCN at both RNA and protein level for AOs in scaffolds while up-regulated OCN for AOs in petri dish. Immunocytochemistry results show that Col I, OPN and OCN signals were strongly detected at the outer part of constructs of AOs-scaffolds and the interface of AOs-scaffolds; while most mineral nodules occurred at the borders of constructs.**Conclusion:** These findings demonstrate that AOs in 3-dimensional scaffolds had different osteogenic characterisation with those on petri dish plates and the 3-dimensional culture system may be a model system for study *in vivo* osteogenesis of alveolar osteoblasts.

I175/SL

Cellular Cardiomyoplasty Using Transgenic Myoblasts Induce Mature Blood Vessel a Better Choice for Cardiac RepairLYE¹, HKH HAIDER², R TAN³, RW GE⁴, IC SONG⁵, PK LAW⁶, EKW SIM⁷¹Department of Cardiac, Thoracic and Vascular Surgery, National University of Singapore, Singapore, ²National University Medical Institute, National University of Singapore, Singapore, ³Department of Cardiology, National Heart Centre, Singapore, ⁴Department of Biological Sciences, National University of Singapore, Singapore, ⁵Department of Experimental Surgery, Singapore General Hospital, Singapore, ⁶Cell Transplants Singapore Pte., Ltd, Singapore, ⁷Department of Cardiac, Thoracic and Vascular Surgery, National University Hospital, Singapore**Aim:** VEGF induces capillary formation. We hypothesise that simultaneous administration VEGF with angiopoietin-1 (Ang-1) using a bicistronic vector together with myoblast transplantation lead to better prognosis for treatment of myocardial infarction.**Methods:** Human skeletal myoblasts carrying Lac-z gene were transduced with adenoviral bicistronic vectors carrying human VEGF165 and Ang-1. Myocardial infarction was created in 17 female pigs by coronary artery ligation and grouped as DMEM injected (group-1 n = 6), Ad-null transduced myoblast transplanted (group-2 n = 5), and myoblast carrying bicistronic vector transplanted (group-3 n = 6). Three weeks later, 5 ml DMEM with or without 3×10^8 cells were intramyocardially injected in and around infarction. Animals were immunosuppressed for 6 weeks using 5 mg/kg/day Cyclosporine-A. Pigs were euthanised and hearts were explanted at 6-weeks post-treatment and processed for histological studies.**Results:** Transduced myoblasts efficiently secreted VEGF165 and Ang-1 simultaneously as revealed by dual fluorescent immunostaining and RT-

PCR. Extensive survival of the Lac-z positive myoblasts was observed in pig heart. Average vascular density at low power field (x100) by double immunofluorescent staining for vWFactor-VIII and smooth muscle actin in group-3 (45.2 ± 5.87 ; 38.6 ± 2.13) was significantly higher than group-1 (16.18 ± 0.91 $P < 0.05$; 7.88 ± 0.52 $P < 0.05$) and group-2 (26.57 ± 2.09 $P < 0.05$; 20.14 ± 1.68 $P < 0.05$) at 6-weeks post-treatment. Mature blood vessel count and regional blood flow in group-3 was the highest (86.33% $P < 0.05$; 2.91 mL/min/g $P < 0.05$). Significant improved EF in group-3 (50.5% $P < 0.05$) was achieved compared with DMEM group.

Conclusion: Simultaneous VEGF165 and Ang-1 gene delivery using skeletal myoblasts as carriers lead to angiomyogenesis with higher percentage of mature blood vessel formation with better prognosis.

I176/SL

Antithrombin III and D-dimer Levels and Their Association with Survival Outcome at 36 Months from Ovarian Cancer

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Aim: To determine the association between pre-operative haemostatic levels of Antithrombin III (ATIII) and D-dimer with survival outcome at 36 months from ovarian cancer. The association of fibrinolytic system and cancer especially in primary tumour extracts to disease-free interval, tumour growth and angiogenesis have been reported. Similarly, systemic enhanced fibrinolysis and thrombin generation are useful markers of disease state.

Methods: The haemostatic data for pre-operative levels of ATIII and D-dimer from 33 patients with ovarian cancer (FIGO Stage I/II n = 10), Stage III/IV n = 23) and aged between 16 years and 80 years (mean 52 ± 14.1 years) were analysed for their association for disease-outcome at 12 months, 24 months and 36 months.

Results: The mortality rate within 36 months was 23 patients and the remaining 10 patients (Stage I/II n = 8) were still living. The median ATIII level for those still living was 104.5% and D-dimer 1940 ng/mL. The median ATIII level from mortality was 88% and D-dimer 9688 ng/mL. There were significant associations ($P < 0.01$) with survival outcome at 12 months (mortality n = 12), 24 months (mortality n=18) and 36 months (mortality n=23) with both ATIII and D-dimer levels.

Conclusion: Mortality from ovarian cancer was associated with further enhanced thrombin generation together with fibrinolysis compared to those still living past 36 months from disease. It is therefore suggested that ATIII, together with D-dimer levels, be used as prognostic haemostatic markers for disease outcome especially in patients with advanced ovarian cancer.

I177/SL

Detection of Epsilon-globin-positive Fetal Primitive Erythroblasts in Newborns with Trisomy 18 (Edward Syndrome)

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Aim: The epsilon-to-gamma globin switch is completed in normal fetuses by 14 weeks gestation. Fetal erythroblasts are increased in cord blood in pregnancies complicated by fetal aneuploidy, but it is not known if the globin switch is delayed. We hypothesised that the epsilon-to-gamma globin switch is not complete in pregnancies complicated by trisomy 18, and that these neonates have epsilon-globin-positive primitive erythroblasts up to term.

Methods: Cord blood from 2 term neonates diagnosed antenatally to have trisomy 18, and from 20 normal neonates was processed using magnetically-activated cell sorting to obtain glycophorin-A-(GPA)-positive fetal erythroblasts. Morphology of these cells was evaluated by Wright stain, and the presence of epsilon-globin within the cytoplasm was determined using alkaline phosphatase immunohistochemistry. Chromosome aneuploidy was confirmed with fluorescence *in situ* hybridisation (FISH). The Mann-Whitney test was used to compare 2 independent samples with non-parametric distribution.

Results: Typical fetal primitive erythroblasts were identified only in the cord

blood of affected neonates. These cells were 42-fold higher in neonates with trisomy 18 compared with normals (1038 vs 25). In both cases of trisomy 18, primitive erythroblasts were epsilon-globin positive (100%; $P < 0.001$).

Conclusion: It is rare for pregnancies known to be complicated with trisomy 18 to continue to term. This is the first report of epsilon-globin-positive fetal primitive erythroblasts identified at such a late gestation (at term). This observation is important: it suggests that either chromosome 18, or the presence of an additional autosome, has a role in the globin-switching mechanism. Understanding and control of the globin switch will expand the therapeutic options available for the management of thalassaemia.

I178/SL

Insulin Sensitiser Ligands for Peroxisome Proliferator-Activated Receptor Gamma Inhibit Proliferation of Human Uterine Leiomyoma Cells

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Aim: Uterine leiomyomas (fibroids) are the most frequently occurring tumour of the female reproductive tract and clinically affect approximately 30% of childbearing-aged women. Effective treatment options are few, and fibroids are the primary cause of hysterectomies in women worldwide. In search for alternative treatments, we determined the efficacy of novel phyto-biomolecules to inhibit or modulate the proliferation of patient-derived myometrial and fibroid cells.

Methods: Primary cell cultures of myometrial and fibroid smooth muscle cells were established from patients undergoing hysterectomy for uterine fibroids at the National University Hospital, Singapore. Cells were characterised by immuno-confocal microscopy and a colorimetric cell proliferation assay. Expression of growth regulatory proteins were determined by immuno-blotting.

Results: Myometrial primary cell cultures exhibited a higher proliferative index compared to their matched fibroid cells. A phyto-biomolecule compound that activates the Peroxisome Proliferator-Activated Receptor (PPAR) gamma showed growth inhibitory effects on uterine cells. Furthermore, the thiazolidinedione PPAR gamma ligand Pioglitazone showed significant dose-dependent inhibition of uterine cell proliferation and cell numbers. The anti-proliferative activity of Pioglitazone was determined within the fibroid patient population with an initial sample size of five patient-derived fibroid cell cultures. The combined results showed a statistically significant reduction of cell proliferation. Fibroid cells were more sensitive to Pioglitazone growth inhibition than their normal counterparts. Growth inhibition was independent of cell cycle inhibition and apoptosis.

Conclusion: Our results suggest the possibility of using PPAR gamma ligands as non-surgical therapeutic agents for the treatment of uterine fibroids. The patient-derived cell cultures provide a useful system to reveal potential targets for intervention of this common gynaecological malady.

I179/SL

Lack of Association of the Missense Glu298Asp Variant of the Endothelial Nitric Oxide Synthase Gene with Preeclampsia in a Malay Population

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Aim: Since nitric oxide (NO) synthesised by endothelial NO synthase (eNOS/NOS3) is thought to be crucial for maintaining maternal systemic vasodilation and reducing vascular reactivity during normal pregnancy, several studies have focused on its possible role in preeclampsia, with mixed results. It is thought that the NOS3 gene has a variable role depending on the population of origin. We tested for evidence of association between the chromosome 7q36 located NOS3 gene and preeclampsia in the local Malay population.

Methods: In a preliminary study, 39 preeclamptic Malay mothers and 54

non-hypertensive Malay mothers were recruited. Blood samples were collected from mothers and matched umbilical cords after delivery, and DNA was extracted using standard procedures. Exon 7 of the NOS3 gene was amplified by PCR, and sequenced to determine the SNP genotype at nucleotide position 894 (G/T). Allele frequencies were compared between cases (with preeclampsia) and controls, as well as between offspring of cases and offspring of controls, using the Chi Square Test.

Results: The genotype frequencies in preeclamptics and controls were in Hardy-Weinberg equilibrium. There was no significant difference in either genotype or allele frequencies between preeclamptic ($T = 0.19$) and non-preeclamptic ($T = 0.20$) mothers, or between offspring of preeclamptic ($T = 0.14$) and non-preeclamptic ($T = 0.19$) mothers.

Conclusion: The SNP genotyping results show no evidence of association between either allele of the eNOS/NOS3 Glu298Asp polymorphism and preeclampsia in our preliminary cohort of patients. Therefore, this gene may not be an important contributor to the etiology of preeclampsia in the local Malay population.

I180/SL

Enrichment of Epsilon-globin-positive First Trimester Fetal Primitive Erythroblasts from Maternal Circulation: Novel Protocol for Early Non-invasive Prenatal Diagnosis

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Aim: Prenatal diagnosis using fetal erythroblasts enriched from maternal blood is an ideal non-invasive strategy, and eliminates the risk of amniocentesis. Only 1 in 10 million maternal nucleated cells are fetal (1 cell/ml maternal blood), and poor enrichment limits the application of this technology to clinical practice. We hypothesised that a multi-step strategy could be developed to enrich these rare cells from maternal blood.

Methods: Density gradient centrifugation, Magnetically Activated Cell Sorting (MACS), selective anucleate erythrocyte lysis, fluorescence immunocytochemistry and chromosomal fluorescence *in situ* hybridisation (cFISH) were combined to develop a multi-step enrichment strategy.

Results: Protocol developed: Maternal whole blood diluted in phosphate-buffered saline was centrifuged over Percoll 1118. Mononuclear cells were recovered from the gradient density interface. White blood cells were depleted using anti-CD45 antibodies, and red cells were selected using anti-GPA antibodies by MACS. Fetal primitive erythroblasts were separated from maternal anucleate erythrocytes by selective lysis with ammonium chloride/1mM acetazolamide mixture, and unlysed cells cytospun onto plain glass slides. Epsilon-globin-positive fetal primitive erythroblasts were identified by a novel combined fluorescence immunocytochemistry and cFISH technique. Protocol tested: This new protocol was tested by sorting for, and identifying, fetal primitive erythroblasts from 20 ml maternal blood obtained after surgical termination of pregnancy. We successfully enriched 17 fetal cells from 20 mL maternal blood ($n = 3$ samples). In all cases the fetal gender predicted matched cFISH results on control trophoblast tissue.

Conclusion: Our novel protocol successfully enriched epsilon-globin-positive fetal primitive erythroblasts from first trimester maternal blood. It is a promising tool for early non-invasive prenatal diagnosis.

I181/SL

The Development of a Conjunctival Epithelial Equivalent with Improved Proliferative Properties Using a Multistep Serum-Free Culture System

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Aim: The ability of bioengineered tissue-equivalents to remain proliferative *in vivo* is critical for promoting tissue regeneration. We investigated the use of a multistep serum-free culture system in developing a conjunctival

equivalent with improved *in vitro* and *in vivo* proliferative properties, and compared it to conventional serum-supplemented conditions.

Methods: Conjunctival epithelial cells were cultivated on human amniotic membrane using a multistep serum-free culture system, under submerged and air-lifted conditions. The Bromodeoxyuridine (BrdU) ELISA proliferation assay, colony-forming efficiency (CFE), and number of cell generations achieved were compared with serum-containing media. The *in vivo* proliferative capability of the tissue-constructs were evaluated by xenotransplantation onto severe combined immune-deficient mice. Cultured cells were evaluated for the expression of keratins 4, 19, 3, and MUC5AC goblet cell mucin.

Results: Epithelial cells cultivated in serum-free media (BrdU absorbance, 1.91 ± 0.08 ; cell generations, 25.6 ± 4.5) were more proliferative than those cultivated in serum-containing media (BrdU absorbance, 1.06 ± 0.08 ; cell generations, 12.1 ± 3.0). The serum-free derived epithelial equivalents demonstrated a significant increase in proliferation and stratification following transplantation. Cells that were air-lifted for 6 and 12 days had a reduced proliferative capacity *in vitro* and *in vivo* compared to submerged cultures. Cultured cells expressed keratins 4 and 19, and MUC5AC. Electron microscopy demonstrated a basal lamina with numerous hemidesmosomes.

Conclusion: We describe the novel use of a multistep serum-free culture system in developing a conjunctival tissue-equivalent with improved proliferative and structural properties, which are crucial for enhancing graft-take and regeneration of the conjunctival surface following clinical transplantation.

I182/SL

Enhancement of Tendon Allograft Osteointegration Using Mesenchymal Stem Cells in a Rabbit Model of Anterior Cruciate Ligament Reconstruction

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Aim: Soft-tissue allografts provide an excellent alternative for revision procedures where suitable autogenous tissues have been previously compromised. However the use of allografts is controversial due to a higher failure rate and slower biological incorporation. Mesenchymal stem cells (MSCs) are currently under investigation as potential agents to enhance bony and cartilage healing in a variety of orthopaedic disorders. We hypothesised that the application of MSCs at the tendon bone junction during ACL reconstruction might result in both acceleration and enhancement of osteointegration, hence improving the success rate of ACL reconstruction with allografts.

Methods: Bilateral ACL reconstructions with tendoachilles allografts were performed in 18 adult rabbits. On 1 limb the graft was coated with allogeneous MSCs in a fibrin glue carrier, while the contralateral limb served as control with no application of MSCs. The reconstructions were assessed histologically and biomechanically at 2, 4 and 8 weeks.

Results: Histologic analysis of the controls revealed granulation tissue and fibroblasts with the development of some collagen fibres resembling Sharpey's fibres by 8 weeks. The tendon bone interfaces of the MSC enhanced ACL reconstructions, however, consistently demonstrated large areas of fibrocartilage between tendon and bone as early as 4 weeks. On biomechanical testing, the MSC enhanced grafts had significantly higher load-to-failure rates than did controls at all time frames.

Conclusion: Use of MSCs to enhance allograft osteointegration is a novel method offering the potential of more physiological, earlier healing and biomechanically stronger allograft ligament reconstructions, and provides an effective ACL reconstruction alternative, for both primary reconstruction and for revision surgery.

I183/SL

Enhancement of Meniscal Regeneration Using Mesenchymal Stem Cells in a Porcine Model

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Aim: To investigate the gross and microscopic morphologic and biomechanical effects of the administration of thrombin glue and mesenchymal stem cells in the enhancement of surgical repair of radial meniscal tears in the porcine model.

Methods: The pig model of a radial meniscal tear is created by a surgical cut made in a radial direction at the inner two-thirds of the medial meniscus. Three groups of animals are studied. For the control, the cut is not treated. The second group has the meniscal tear treated with thrombin glue and suture repair. The third group has the meniscal tear treated with thrombin glue with mesenchymal stem cells and surgical repair. The mesenchymal stem cells are harvested from each individual pig and processed by the technique developed by the principle investigator. The animals are sacrificed at 8 weeks and the menisci undergo the following investigations: Determination of meniscal vascular anatomy by histology Gross and microscopic examination of the repair process.

Results: Imaging of the porcine meniscus revealed relative avascularity of the inner two-thirds of the meniscus compared to the outer third. This is similar to that seen in the human model. Healing was seen in the 2 treated groups on histologic examination. The group treated with mesenchymal stem cells showed significantly improved healing compared to the group not treated with stem cells.

Conclusion: The result of this basic science study validates the safety and efficacy of using mesenchymal stem cells to enhance the healing process of central meniscal tears and justifies further investigation of this treatment in clinical trials.

I184/SL

Temperature and Temporal Effect on Viability and Proliferation of Bone Marrow Stem Cells

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Aim: In cell transplantation studies there is a time lag between cell preparation and implantation. In this critical period, cells are out of their physiological conditions. Our study investigates bone marrow stem cell (bMSC) viability and colony forming efficiency (CFE) at varying temperatures over time.

Methods: Cells were removed from culture and washed in PBS. They were subjected to varying temperatures of 4, 22 and 37°C for periods of 1, 3 and 5 hours. Cell viability was assessed by Trypan blue exclusion and fluorescent labelling. CFE was assessed by seeding cells low densities and counting colonies that form.

Results: Viability at 4°C remained above 90% for up to 5 hours. At 22°C and 37°C, viability decreased from 91% to 80% and 86% to 49% from 1 hour to 5 hours respectively. CFE at 5 hours post incubation showed that at days 15 and 30, the control group had significantly more colonies than the test groups. Although cells remain more viable at 4°C, the CFE for both 4°C and 22°C had no significant difference and were much lower than the control. 37°C appears to be the least favourable temperature to store cell preparations.

Conclusion: Delay in implantation, despite preservation in ice, may have significant adverse effects on cell viability and ability to proliferate.

I185/SL

Selection of Cell Source for Ligament Tissue Engineering

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Aim: Anterior cruciate ligament (ACL) fibroblasts, medial collateral ligament (MCL) fibroblasts, mesenchymal stem cells (MSC) and embryonic stem cells (ESC) are potential cell sources for ligament tissue engineering. Research on ESC is currently associated with technical difficulties, long-term uncertainty of outcome and ethical considerations. Therefore, the use of lineage specific cells and adult stem cells are preferred in tissue engineering applications. The aim of the current study is to determine the most suitable cell source for potential ligament tissue engineering.

Methods: Cell proliferation and collagen expression of ACL fibroblasts, MCL fibroblasts and MSC were examined. Collagen type I, II and III, and alpha smooth muscle actin of these cells were evaluated using immunohistochemistry techniques. Green Fluorescent Protein (GFP)-transfection technique was used to trace the MSC in the tissue engineered ACL construct.

Results: The results revealed that MSC had better proliferation rate and total collagen expression than ACL and MCL fibroblasts. In the mean time, MSC, ACL and MCL fibroblasts were all strongly stained with antibodies of collagen type I and III, and alpha smooth muscle actin while negatively stained with collagen type II antibody. The loaded MSC could be found survival even at 6 weeks after implantation.

Conclusion: The results showed that MSC are a better cell source than ACL and MCL fibroblasts for anterior cruciate ligament tissue engineering.

I186/SL

Recovery in the Expression of Myosin-Heavy-Chain Isoforms, 7 Months after Repairing a Completely Lacerated Skeletal Muscle with Microanastomosis of the Intramuscular Nerve Branch

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Aim: The Myosin heavy chain (MHC) isoforms are proteins associated with muscle fibre contraction, and play a predominant role in regulating the contractile characteristics of a fibre. In the repair of injured muscles, the recovery of MHC expression would suggest a return of its contractile characteristics. This study investigates the expression of the MHC isoforms in lacerated muscles that were repaired, looking at the effects of repairing the intramuscular (IM) nerve branch on the contractile characteristics of the muscle.

Methods: Completely lacerated medial gastrocnemius (MG) muscles in adult rabbits were used in 3 different Repair Groups: A) No muscle repair; B) Immediate muscle repair and C) microanastomosis of the main IM nerve branch, followed by immediate muscle repair. A control muscle repair model (Group-D) involved one that was lacerated but with the IM preserved intact. The contralateral muscles serve as controls. Assessment was at 5 months and 7 months, with the isometric contractile properties measured.

Results: Full recovery of MHC I and MHC II in the distal segment for Group-C, and a near full recovery for Group-D were observed at 7 months. While Group-A and -B had an adverse reduction in MHC II and drastic increase in MHC I reflect an in-balance probably due to minimal reinnervation in some segments.

Conclusion: The data suggest that IM nerve repair with muscle repair will play an important role in returning the contractile properties of the muscle.

I187/SL

Functional Evaluation of Patients with Anterior Cruciate Ligament Deficiency

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Aim: Currently, functional assessment following anterior cruciate ligament (ACL) injury relies mainly on clinical examination and passive testing of knee laxity. It was hypothesised that direct measurement of ambulatory function and more demanding activities such as stair climbing would be an appropriate method to perform functional evaluation of the ACL.

Methods: Six healthy volunteers and 9 patients with isolated ACL deficiency participated in this controlled study. Gait analysis was performed during stair climbing using a 5-camera motion capture system and force platform fitted into a custom staircase. The data were analysed to study between-limb differences for each subject.

Results: All subjects walked up and down the stairs without pain or discomfort at the same speed of 0.6 m/s. From gait analysis data, patients with ACL deficiency displayed a significant ($P < 0.05$) reduction of up to 50% in

peak knee flexion moments in their involved knee during stair ascent. Peak moments in the involved knees reached only 0.3 Nm/kg. During stair descent, at over 60%, the reduction of knee moments in the involved knee was more pronounced. Moments in the involved knees reached only 0.2 Nm/kg. For the control group there were no significant differences in knee moments between left and right knees. There were also no significant differences between the uninvolved knee of patients and the knees of the normal control group.

Conclusion: Direct measurement of ambulatory function is feasible and a practical tool for guidance of the management and rehabilitation process for ACL deficiency.

I188/SL

Differential Expression of Cell Cycle Regulator Proteins in Nasal Polyposis

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Aim: We present an immunohistochemical profile of cell cycle regulator proteins in diseased epithelium of nasal polyps. Nasal polyposis affects 2% to 4% of the population. Precise mechanisms contributing to its pathogenesis are not clearly understood. Recurrent infections, rupture of the epithelium and production of granulation tissue, inhaled or food allergens, T cell disturbances, and aerodynamic factors have all been implicated. Its recurrent nature suggests aberrations of cell cycle regulation of diseased nasal epithelium, contributing to increased epithelial proliferation.

Methods: Pathology specimens of 28 patients with unilateral/bilateral nasal polyposis, who underwent functional endoscopic sinus surgery were obtained. Pathology specimens of inferior turbinates of 10 patients who underwent unrelated surgery were used as normal controls. A standardised immunohistochemical protocol for staining of cell cycle regulator proteins (p21, p27, p53, p63 and Ki67) was applied to both set of specimens.

Results: There is differential expression of p21 and p27 between epithelium of nasal polyps and inferior turbinate mucosa. Marked reduction in expression of p27 is noted. This is often present in conjunction with a higher proliferation index (as indicated by Ki67 expression). We report no difference in p53 and p63 expression in both types of tissue, in contrast to reports by previous authors.

Conclusion: Dysregulation of epithelial proliferation is present in nasal polyps. There is marked reduction in p21 and p27, both of which are suppressors of the cell cycle in normal, proliferating cells.

I189/SL

Bcl-x is Co-expressed with GFAP in Reactive Gliosis and Various Gliomas: A Potential Marker for Diagnostic Pathology

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Aim: Bcl-x is an anti-apoptotic molecule that has been noted to stain reactive astrocytes. We set out to study the expression of bclx and GFAP in various gliomas and reactive brain conditions in an attempt to discover if bcl-x might be useful as a second marker for gliomas.

Methods: Cases of gliomas and reactive brain disorders were retrieved and the histology reviewed. These included astrocytomas (pilocytic, diffuse fibrillary, anaplastic, SEGA), ependymoma, ganglion cell tumour, GBM, oligodendroglioma, mixed tumours (oligo-astrocytomas, ganglioglioma) and subependymoma. Cases of reactive gliosis, cerebritis and mesial temporal sclerosis were also included. Immunostaining for bcl-x and GFAP was performed, following heat-induced antigen retrieval and using DAB as chromogen. Selected cases were also subjected to double immunofluorescent labelling using both GFAP and Bcl-x.

Results: Expression of bcl-x closely follows that of GFAP with strong expression in both reactive astrocytes and astrocytomas. There is more focal expression in neoplastic cells of other gliomas. Immunostaining for bcl-x is

generally more distinct with less background, compared to that for GFAP. Expression of both GFAP and bcl-x is more focal in oligodendrogliomas, with staining of mainly intervening astrocytic processes. Double immunolabelling confirms the co-expression of bcl-x and GFAP.

Conclusion: Bcl-x is co-expressed with GFAP in various gliomas and reactive brain conditions. Immunostaining for bcl-x is generally more distinct and intense. In the appropriate context, immunostaining for bcl-x may be useful in the identification of gliomas, in particular, astrocytomas.

I190/SL

The Role of Activin System in Keloid Pathogenesis

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Aim: Activin A is a dimeric protein and a member of the TGF- β superfamily. It regulates various aspects of cell growth and differentiation in many tissues. Activin signalling is modulated by a variety of extracellular modulators like inhibin and follistatin, acting at different steps. Our aim is to investigate the biological response of normal (NF) and keloid fibroblasts (KF) on activin A and follistatin stimulation.

Methods: Different strains of NF and KF were seeded at 50% confluence in DMEM/10% FCS and then starved in plain DMEM for 48 hours. Activin A (Concentration of 50, 100 ng/mL of commercial activin A) and follistatin were added to cells. Synergistic effect of activin with TGF- β 1 was explored by treating cells with TGF- β 1 along with activin. The production of collagen, fibronectin, α -SMA and PCNA by NF and KF under activin A and follistatin stimulation was assessed by Western blot using antibodies against these proteins.

Results: Normal and keloid fibroblasts showed an increased expression of collagen when treated with activin A. No significant difference was observed in the production of collagen in activin, TGF- β and activin + TGF- β treated cells suggesting lack of synergism between the two. Interestingly, though follistatin seemed to stimulate the production of collagen, when added with activin A completely stopped its expression. A similar expression profile was seen for fibronectin, α -SMA and PCNA. However, expression of these was seen in follistatin + Activin treated cells unlike the lack of expression of collagen observed upon similar treatment.

Conclusion: The expression profiles of the key growth factors indicate a possible role of activin A and follistatin in keloid pathogenesis.

I191/SL

Epithelial Interactions in Keloids Induce Contraction of Fibroblast Collagen Lattices

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Aim: Keloid scars represent a pathological response to cutaneous injury. The pathological biology of these scars remains poorly understood. The role of epithelial-mesenchymal interactions in keloid pathogenesis and scar contracture has recently been explored. Our aim is to explore the role of epithelial-mesenchymal interactions in scar contracture and keloid pathogenesis.

Methods: A co-culture model was employed wherein keloid and normal keratinocytes were co-cultured with keloid or normal fibroblasts, and the conditioned media from day 5 co-cultures collected to study the effect of the paracrine secretions on contraction of an in vitro fibroblast-populated collagen lattice model (FPCL). Anti-TGF-beta1 neutralising antibody was added to the conditioned media to see its effect on FPCL. In addition, keloid and normal fibroblasts were cultured on chamber slides and treated with conditioned media from co-culture and non co-culture series. Immunohistochemical analysis was done to investigate the expression of alpha-smooth muscle actin.

Results: 1) Keloid keratinocyte/keloid fibroblast co-culture conditioned media brought about increased contraction of the collagen lattice as compared to non co-cultured conditioned media. In addition increased lattice contraction was induced in keloid FPCL, compared to lattices populated with normal fibroblasts. 2) Expression of alpha-smooth muscle actin was increased in keloid derived fibroblasts treated with keloid keratinocyte/keloid fibroblast-

co-culture conditioned media. 3) Anti-TGF-beta 1 neutralizing antibody attenuated contraction of keloid FPCL'S when added with the co-culture conditioned media.

Conclusion: Paracrine output from epithelial-mesenchymal interactions between keloid keratinocytes and keloid fibroblasts modulate contraction of fibroblast-populated collagen lattices, strongly suggesting its role in scar and wound contraction. Our work also underscores the role of TGF-beta 1 as a key player in keloid pathogenesis

I192/SL

Specific Target Sp1 Transcription Factor – A New Therapeutic Approach for Keloids

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Aim: Accumulation of extracellular matrix (ECM) components is a direct cause of fibrotic conditions resulting in keloid scars. Several ECM promoters are regulated by Sp1. Bisanthracyclycline WP631 and Mitoxantrone are potent inhibitors of Sp1-activated transcription. They competitively bind for the common Sp1 binding site, thereby directly preventing the transcription of ECM genes. Our aim is to investigate the effects of WP631 and Mitoxantrone on collagen, fibronectin and alpha-smooth muscle actin (SMA) expression.

Methods: A co-culture model was used whereby keloid and normal keratinocyte were co-cultured with keloid and normal fibroblast. Normal, keloid and hypertrophic scar fibroblasts were also cultured independently. Additionally, a reverse inhibitory action of the drugs was studied to detect the expression of ECM genes from an inhibitor suppressed condition back to a non-inhibitor condition with removal of the drug after 24 hours. Cultured cells were exposed to both drugs for 24 and 36 hours. Cell lysates were assayed.

Results: WP631 as compared to Mitoxantrone was able to suppress expression of collagen and fibronectin more effectively in both 24 and 36 hours. However, immuno-detection on alpha-SMA yielded almost consistent results showing comparatively same band intensity from the positive control, suggesting that the alpha-SMA gene might not have a binding site for Sp1 at its promoter. Thus a different transcription factor might be required for the transcription of alpha-SMA gene. Efforts to detect Sp1 level revealed no significant differences.

Conclusion: These preliminary data suggest that WP631 and Mitoxantrone could be used in the treatment of fibrotic diseases such as keloid.

I193/SL

Autologous Myoblasts Transduced with a Novel Bicistronic Adenoviral Vector Expressing VEGF and Angiopoietin-1 in a Rabbit Model of Hind Limb Ischaemia

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Aim: The role of VEGF and Angiopoietin-1 (Ang-1) in therapeutic angiogenesis has been well documented. We aim to assess the efficacy of autologous myoblasts as carriers of VEGF165 and Ang-1 in improving circulation in a rabbit model of hind limb ischaemia.

Methods: Primary rabbit myoblasts were isolated and expanded in culture. They were labelled with retrovirally-transduced lac-z gene, 4, 6-diamidino-2-phenylindole (DAPI) and 5-bromo-2'-deoxy-uridine (BrdU). Adenoviral bicistronic vector (Ad-Bic) expressing for VEGF165 and Ang-1 genes was used for myoblasts transduction. Hind limb ischaemia model was created in New Zealand white female rabbits by femoral artery ligation and assessed by angiography. The animals were grouped to receive intramuscularly myoblasts transduced with Ad-Bic group-1 n=10, non-transduced myoblasts group-2 n = 10 and DMEM without myoblasts group-3 n = 8. Six weeks post treatment, neovascularisation in the limb was assessed by angiography. The animals

were euthanised and harvested for histological studies.

Results: The skeletal muscle biopsies generated >75% to 80% desmin positive myoblasts. In vitro transduction efficiencies of lac-z and Ad-Bic were 80% and 75-80% respectively. Extensive myoblasts survival was observed in groups-1 and 2 as visualised by DAPI, BrdU and lac-z staining. Angiography revealed enhanced collaterals in group-1 as compared to groups-2 and 3. Immunostaining for vWFactor-VIII confirmed increased capillary density in group-1 (19.04 ± 1.59) compared to group-2 (5.69 ± 0.51) and group-3 (3.03 ± 0.20).

Conclusion: Therapeutic angiogenesis using myoblast-mediated synergy between Ang-1 and VEGF provides a potential therapeutic option for treatment of peripheral vascular disease.

I194/SL

The Effect of Chronic Bladder Outlet Obstruction on the Expression of Neuronal Nitric Oxide Synthase in the Guinea Pig Urinary Bladder

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Aim: To examine the effect of chronic partial outlet obstruction on expression of neuronal nitric oxide synthase (nNOS) in the intramural ganglion cells of the guinea pig bladder.

Methods: Partial urethral ligation was done in 17 young male guinea pigs. In addition, 3 served as controls while 7 had sham operation. The animals were sacrificed at 2, 4, 6, 8 and 12 weeks and nNOS immunohistochemistry performed on the intramural neurons of the bladder. nNOS positive ganglia were individually counted and plotted against duration of obstruction. In addition, mRNA expression of nNOS was done using qRT-PCR technique.

Results: All the guinea pigs displayed signs of bladder outlet obstruction. At 2 weeks post-ligation, the number of nNOS positive neurons declined to 2366 ± 260.97 compared to 3403 ± 604.70 in normal controls (*P* < 0.05). The decrease was most drastic at 4 weeks (1342 ± 143.13) (*P* < 0.01 compared to control). Many neurons underwent degenerative changes. At 6 weeks, the numbers rose from its 4 weeks nadir to levels near 12-week shams. qRT-PCR showed 42.4% down-regulation of nNOS expression at 4-weeks followed by 75.8% increase by 12-weeks.

Conclusion: We have successfully created the animal model of chronic bladder outlet obstruction to simulate gradual obstruction seen in BPH in humans. A decline in nNOS-positive neuron numbers followed by compensatory increase towards near-normal levels by the third month suggest attempts to up-regulate nitric oxide bioactivity following bladder outlet resistance.

I195/SL

Biodegradable Stent – A Safe and Effective Stent for the New Century

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Aim: To make use of the biodegradable material to produce a stent that is inert and degradable within a defined period without causing obstruction, infection and encrustation. The stent will have a variable time span predetermined to avoid distress and discomfort to the patients.

Methods: Biodegradable stent would be radiologically opaque with bromium sulphate. The study was carried out for 6 months. Six dogs were used for this study with 6 right ureters inserted with the normal stents and the other side inserted with the biodegradable stents. Postoperatively, the dogs were monitored for general well-being with urine output and infection. Regular X-rays were taken at monthly intervals to determine the status of the stent. The dogs were sacrificed 3 months later and the ureters were taken out. Histological evaluation was performed.

Results: All 6 dogs underwent surgery uneventfully. Among the 6 dogs, only 1 dog developed complications. The biodegradable side had been normal and the stent degraded within the time without trace. Histological analysis showed no significant changes on the ureters both at the site of the anastomosis

and 4 cm from it.

Conclusion: With this preliminary evaluation of the biodegradable stent, it is promising that the biodegradable stent is able to perform the same function as the commercial stent without causing obstruction, impaction and other complications. The future use of the biodegradable stent can be further evaluated with the incorporation of medication. This will further add value and function of the stent.

I196/SL

Fracture Toughness of Resin-based Dental Composite Restoratives

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Aim: This research was aimed to determine the fracture resistance of dental composite restoratives using the single-edge notch (SEN) specimens.

Methods: The materials investigated were nanofill (Filtek Supreme [FS], 3M), minifill (Z100 and Filtek Z250, 3M), microfill (A110, 3M), flowable (Filtek Flow [FF], 3M), poly-acid modified (F2000, 3M; Dyract Xtra [DX], Dentsply), giomer (Beautifill [BF], Shofu) and ormocer (Admira [AV], Voco) composites. Five specimens (25 x 2 x 2 mm³) of each material were prepared and conditioned in distilled water for 1 week at 37°C. A sharp notch was then formed on the middle of the specimens using a diamond saw and a razor blade was used to initiate the precrack producing a precrack length to thickness (a/w) ratio of about 0.5. The specimens were conditioned in distilled water at 37°C for another 1 week prior to the fracture test. The 3-point bending test was conducted using a universal testing system at a crosshead speed of 0.5 mm/min. Inter-material fracture toughness was compared with the use of ANOVA/post-hoc Scheffe's tests at a significance level of 0.05.

Results: The fracture toughness (K1c) ranged from 0.51 to 1.19 MPa.m^{0.5}. The K1c of Z100 and FS was significantly higher than DX, AV, F2000 and A110. Z250 was significantly more fracture resistant than F2000 and A110. The microfill A110 was found to have the lowest toughness.

Conclusion: The fracture toughness of dental composite restoratives was material dependent. Dental composites which were reinforced by zirconia and silica glass filler particles may have higher resistance to fracture.

I197/SL

Physical Properties of a New Root-end Filling Material

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Aim: The physical properties of a new root-end filling material we developed were studied and compared to ProRoot MTA (Tooth Coloured Formula) (WMTA).

Methods: The new material consists of a powder and a liquid. A mixture of both components resulted in a material with a handling characteristic and consistency similar to commercially available root-end filling materials such as IRM and Super EBA. The physical properties of this new material as well as WMTA were evaluated according to the ISO standards.

Results: The radiopacity of the new material was equivalent to 4.5 mm of aluminium while that of WMTA was 6.5 mm of aluminium. The pH of the new material was 11.4 when freshly mixed, rising to 12.7 after 60 minutes, while that of WMTA was 11.4 when freshly mixed, rising to 13.0 after 60 minutes. The initial and final setting times of the new material were 40 minutes and 140 minutes respectively, while that of WMTA was 45 minutes and 145 minutes respectively. The solubility of the new material was 2.14% mass fraction, while that of WMTA was 1.28% mass fraction at 24 hours. The results showed that the new root-end filling material had physical properties comparable to WMTA, as well as satisfying the requirements for use as a dental root canal sealing material.

Conclusion: Further development of this material is indicated to produce a root-end filling material which combines the superior biocompatibility of WMTA with the excellent handling characteristic of materials such as IRM and Super EBA.

I198/SL

Evaluation of the Feasibility and Safety of Ultra Polycaprolactone as a Dural Substitute

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Aim: Dural grafts are required to cover defects resulting from excision or shrinkage following neurosurgical procedures. Such grafts will need to possess suitable mechanical properties and be non-immunogenic. It is also imperative that they be easily manufactured and easy to handle during surgery. Polycaprolactone (PCL), a biodegradable polymer has been used as a suture material. Recently, it was found that biaxial drawing of PCL into ultra-thin films produces a membrane-like sheet that could possibly be used as a dura substitute. The aim of this study was to evaluate the feasibility and safety of ultra-thin PCL film as a dura substitute.

Methods: PCL pellets were dissolved in methylene chloride and cast over glass sheets forming films. These films were biaxially drawn with a machine into ultra-thin sheets. Under general anaesthesia, 15 rabbits had mid-cranial incisions made. Skin flaps were raised and 2 9-mm circular defects were created on the cranium, exposing the dura. Dura defects of similar sizes were made. The left defect was covered with ultra-thin PCL film. The right was replaced with excised dura as a control. The rabbits were observed and the dural implants were inspected at 6 and 12 weeks before sacrifice.

Results: The process of manufacturing the films was simple. It was easy to handle during surgery. No complications like infections etc. were noted in the rabbits.

Conclusion: PCL is safe as a dura substitute. It is readily available and easy to handle during surgery. We wish to acknowledge: NMRC/0459/2000 and NMRC/0747/2003.

I199/SL

Transplantation of Bone Marrow Derived Stem Cells for Cardiac Repair

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Aim: The present study assesses cellular angiogenesis using bone marrow derived stem cells (BMCs) for the treatment of myocardial infarction.

Methods: Myocardial infarction was created in adult female New Zealand white rabbits (n=15) by LAD coronary artery ligation. The animals were randomised to receive 1 ml basal medium (DMEM) without cells (group-I n = 5) or 3 x 10⁷ BMCs (group-II n = 10). BMCs was aspirated from donor rabbit and cultured in DMEM medium with 20% FBS. The adherent cells were propagated and labelled with lac-z, BrdU and DAPI prior to transplantation. The animals were administered 5 mg/kg cyclosporine 5 days prior to until 6 weeks after cell transplantation. The heart function was assessed by echocardiography. The animals were euthanised at 8 weeks after cell transplantation for histological studies.

Results: The preliminary data showed that lac-z and BrdU labelled BMC survived both in the normal and infarcted region. Interestingly, lac-z positive donor BMCs was observed in the walls of vasculature. Immunostaining with vonWillebrand factor VIII and smooth muscle actin showed that the BMCs transplanted region contained significantly higher blood vessels when compared with the DMEM injected group ($P < 0.001$). Preliminary heart function data revealed that there was improved left ventricular ejection fraction ($P = 0.008$) and fractional shortening ($P = 0.017$) after BMCs transplantation as compared to group-I DMEM injected animals.

Conclusion: Bone marrow derived stem cells survived in both normal and infarcted region of rabbit heart, formed blood vessels and may play a role in stimulating neovascularisation, with subsequently improved cardiac function.

I200/AH**NM23B, A Putative Tumour Metastasis Suppressor Gene, Is Down-regulated in HER-2/neu Positive Breast Cancer**SY NG¹, DH ZHANG², LK TAI¹, SK SETHI³, ESC SETHI²¹Department of Pathology & Laboratory, National University Hospital, Singapore, ²Department of Laboratory Medicine, National University Hospital, Singapore, ³Department of Laboratory Medicine, National University Hospital, Singapore

Aim: The HER-2/neu or c-erbB2 kinase receptor promotes cell proliferation, invasion and metastasis through the PI3K/AKT signal transduction pathway. Its overexpression in tumours is associated with poor prognosis. The aims of this work are to analyse the differential protein expression profiles between HER-2/neu-positive and -negative breast tumours and to identify gene transcriptions associated with HER-2/neu status.

Methods: We used cDNA microarrays to identify genes that are differentially regulated by HER-2/neu in breast tumours. Differential expression of such "discovered" genes were further confirmed and validated by real time RT-PCR, Western blot, reverse-phase protein arrays and tissue microarrays.

Results: A cohort of genes that were differentially regulated by HER-2/neu in breast tumours was identified. They include genes encoding mammaglobin 1, cytochrome c oxidase subunit VIa and ferritin which were significantly up-regulated, and those encoding NM23B (a non-metastatic cell 2 protein), olfactory marker protein, and small proline-rich protein 2B which were down-regulated in HER-2/neu positive breast tumour. Down-regulation of NM23B was further confirmed by Western blot, real time RT-PCR and reverse-phase protein array in 20 cases of frozen tissues. Immunohistochemical analysis of tissue microarrays constructed from 97 breast cancers showed the significant inverse relation of NM23B expression with HER-2/neu expression ($P = 0.032$).

Conclusion: cDNAs microarray analysis provides meaningful information of the transcriptomic differences characterizing these subsets. Down-regulation of NM23B, a putative tumour metastasis suppressor gene identified may be involved in cellular functions leading to the more aggressive phenotype in this subset of breast tumours.

I201/MPC**Characteristics of Refusals in a Community-based Prevalence Survey of Neurological Diseases Among Older Singaporeans – Speeds Study**N VENKETASUBRAMANIAN¹, LCS TAN¹, S SAHADEVAN², JJ CHIN³, ES CHIN⁴, CY HONG⁵, SM SAW⁶¹Department of Neurology, National Neuroscience Institute, Singapore,²Department of Geriatric Medicine, Tan Tock Seng Hospital, Singapore,³Department of Geriatric Medicine, Tan Tock Seng Hospital, Singapore,⁴Research, National Neuroscience Institute, Singapore, ⁵Community,⁶Occupational and Family Medicine, National University of Singapore, Singapore, ⁶Community, Occupational and Family Medicine, National University of Singapore, Singapore

Aim: The SPEEDS study is a large community-based prevalence survey of Stroke, Parkinson's disease, Epilepsy and Dementia among adult Singaporeans aged 50 years and above. The overall participation rate was 67%. This paper reports the characteristics of those who refused to participate in this study

Methods: The study population comprised 24,978 subjects of Chinese, Malay and Indian descent, aged 50 years and above, living in the Ang Mo Kio, Bishan, Serangoon, Thomson, Toa Payoh and Yishun areas. They were randomly sampled, stratified by race in a Chinese:Malay:Indian ratio of 3:1:1. Trained interviewers sent an introductory letter followed by a phone call to potential subjects. The age, gender and race of those who refused to participate were recorded. Data were analysed using Epi-Info 6.

Results: Of the 24,978 possible subjects, 14,906 participated, 2699 were not eligible, 3370 remained uncontactable, and 3994 refused to participate. The refusal rate was 21.4% among eligible males and 14.6% among eligible females ($P < 0.001$). The refusal rate was highest among the Chinese (21.0%), lowest among the Indians (9.9%), with the Malays at 15.5%, ($P < 0.001$ by pair-wise comparisons). Refusal rates varied among the different age groups, highest (23.9%) among the 85 to 89 years age group and lowest (14.6%) among the 75 to 79 years age group.

Conclusion: Refusal rates are higher among males, Chinese and the very old. The reasons for this need further study. The lack of participation of subgroups of study populations could lead to a selection bias and consequent inaccurate findings. Funding: NHG, NMRC

I202/MPC**Functional Magnetic Resonance Imaging of Working Memory in First-Episode Schizophrenia**HY TAN¹, WC CHOO², S GRAHAM³, C FONES¹, M FONES⁴¹Department of Psychological Medicine, National University of Singapore,²Cognitive Neuroscience Laboratory, Singhealth Research³Department of Psychology, National University⁴Singhealth Research Laboratories, Singapore

Aim: Working memory is adversely affected in schizophrenia. Existing imaging studies have characterized the functional anatomy of working memory in chronic schizophrenia where disease progression and therapeutic intervention might influence activation. Here, we evaluate cortical activation in response to two working memory tasks in first-episode schizophrenia to characterize the functional anatomy of early disease.

Methods: We studied 11 first-episode schizophrenia patients with less than 1 year duration of psychosis and who were treated with atypical antipsychotics. They were compared to 11 matched healthy controls. Each group performed two verbal working memory tasks while undergoing fMRI: one required maintenance of letters (LTR); the other required manipulation in addition to maintenance (PLUS).

Results: Performance in both tasks was poorer but not slower in patients. Both patients and controls activated a predominantly left-sided frontal-parietal network, with PLUS eliciting activity of greater magnitude and spatial extent. With both tasks, patients showed less dorsolateral prefrontal cortex (DLPFC) activity, and greater ventrolateral prefrontal cortex (VLPFC) activity relative to controls. In patients but not in controls, performance was correlated with right VLPFC activation. Further, the task requiring manipulation resulted in greater VLPFC and less anterior cingulate activity in patients.

Conclusion: In patients with first-episode schizophrenia, tasks engaging verbal working memory reveal hypo- and hyperactivity in several prefrontal regions compared to controls. This suggests the presence of complex interactions between dysfunctional and adaptive responses within the prefrontal cortex, early in the course of schizophrenia.

I203/SC**The Use of NMP22 and Urine Cytology for the Surveillance of Patients With Superficial Bladder Cancer**WJ CHUA¹, E CHIONG¹, L LIEW¹, R KAMARAJ², K KAMARAJ¹¹Department of Urology, National University Hospital, Singapore,²Department of Surgery, National University of Singapore, Singapore

Aim: Superficial bladder cancer surveillance is expensive because of the intensive follow-up regime after the initial treatment. The aim of this study is to determine if nuclear matrix proteins (NMP22) can safely replace interval cystoscopy in detecting recurrence.

Methods: Thirty-four consecutive patients with biopsied proven low-grade (G1/G2) superficial bladder cancer (Ta/T1) were followed up for 2 years. Freshly-voided urine were collected for NMP22 and urine cytology test prior to cystoscopy at each follow-up visit.

Results: One hundred seventy-two urine samples were tested, 61 using NMP22 assay and 41 using NMP22 drop-test. 35 samples were tested with both and this showed 100% concordance. Bladder biopsies were taken from patients with suspicious lesion detected on cystoscopy or with positive cytology result. The results were compared with cystoscopy and histological findings. Using cut-off value of 8 U/mL, the sensitivity, specificity, positive predictive value (PPV) and negative predictive value (NPV) of NMP22 in detecting TCC recurrences were 87.5%, 81.6%, 18.9% and 99.2% respectively. When combined with urine cytology, the sensitivity, specificity, PPV and NPV were 100%, 77.1%, 18.9% and 100%, respectively.

Conclusion: Our result shows that in surveillance of patients with low grade superficial bladder cancer, it is safe to replace interval cystoscopy with

NMP22 and urine cytology test. We recommend increasing the cystoscopy interval to 6 monthly for the 1st year and yearly from the 2nd year in this group of patients. This will translate to a 30% cost saving over 5 years.

I204/SC

Cortisol Metabolism in Polycystic Ovarian Syndrome

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Aim: In obesity in men, 11 β -Hydroxysteroid Dehydrogenase Type 1 (HSD1) activity in liver is impaired, contributing to enhanced metabolic clearance of cortisol and increased ACTH drive to adrenal androgen secretion. Preliminary evidence suggests similar disruption of hepatic 11 β -HSD1 in women with PCOS. In the ovary, granulosa cell 11 β -HSD1 activity and gene expression increases during follicular development. Failure of this increase in 11 β -HSD1 may contribute to hyperandrogenism and anovulation in PCOS. The aims of the study were to evaluate systemic and tissue-specific activity of 11 β -HSD1 (converts inactive cortisone to active cortisol) in PCOS.

Methods: In 10 control and 11 PCOS patients undergoing IVF, we measured: 1) Systemic excretion of glucocorticoid and androgen metabolites by GCMS. 2) Hepatic 11 β -HSD1 activity after dexamethasone suppression followed by oral administration of cortisone and serial venepuncture for plasma sampling over 180 mins. 3) Cortisol metabolism by ovarian granulosa cells obtained during IVF. 4) Follicular fluid concentration of glucocorticoids.

Results: Systemic 11 β -HSD1: Urinary excretion of glucocorticoid metabolites were not different between the 2 groups. Hepatic 11 β -HSD1: After dexamethasone, plasma cortisol was equally suppressed in both groups. Conversion of oral cortisone to cortisol was significantly impaired in PCOS. Ovarian 11 β -HSD1: 11 β -reductase activity was significantly lower in PCOS compared to controls (mean \pm SE % conversion cortisone to cortisol: 29.7 \pm 2.3 vs 22.5 \pm 2.3, $P < 0.005$).

Conclusion: The data demonstrates a tissue-specific (liver and ovary) impairment of 11 β -HSD1 activity in-vitro. Altered 11 β -HSD1 activity in PCOS may be amenable to novel therapeutic manipulation.

I205/SL

Resistance to Fas-mediated Apoptosis in Gestational Trophoblastic Disease: Implications for Immune-privilege

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Aim: An immune-privileged site occurs when allogenic tissue grafts have the greater propensity for prolonged survival in the host tissue. In this context, the survival and proliferation of malignant trophoblasts in the gravid uterus is presently unclear. Current evidence suggests that ligation of the cell surface molecule Fas and its natural ligand, FasL could lead to induction of apoptosis in several cell types. In this study we investigated the co-expression of Fas/

FasL in choriocarcinoma (CC) cell lines.

Methods: Using the well characterised BeWo and NJG trophoblast cell lines we provide evidence for immune-privilege using flowcytometry, MTT assays, co-culture and RT-PCR analyses.

Results: The mean fluorescence intensity of Fas receptors for NJG and BeWo were 1.47/0.5 and 1.59/0.4 (mean/SD) while that for Fas positive Jurkat cells was 25.6/3.1 suggesting a down regulated Fas expression in CC. In BeWo and NJG cells the mean cell viability declined to about 58% and 63% of the control in the presence of anti-Fas mAB while Fas sensitive Jurkat cells showed viability of only 10% using MTT assays. This resistance to Fas-mediated apoptosis in CC cells is reversed in the presence of cycloheximide which further decreased viability to 36% and 32% respectively ($P < 0.05$). In co-culture experiments these CC cells induced apoptosis in Fas-sensitive Jurkat cells, thereby imparting immune-privilege.

Conclusion: Our data indicate that CC cells evade immune attack by down regulation of the Fas receptor and by killing lymphocytes through expression of FasL. The potential involvement of Fas/FasL in malignant transformation is of significance in evasion of cell death and promotion of proliferation and metastasis of such tumours.

I206/SL

Hypoxia Downregulated VCAM-1 Expression and Secretion in Human Placental Trophoblasts

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Aim: Many processes that are involved in cellular invasion, including blastocyst implantation, placental development and rapidly growing tumours occur in reduced oxygen environments. It has been surmised that oxygen tension could regulate the cytotrophoblast ability to differentiate, and as a consequence, to express proteins that are critical for placentation. The objective of this investigation was therefore to test the hypothesis that placental tissues and trophoblast cells in culture, under low oxygen tension, release angiogenic factors which could affect vascular behavior and invasive potential, thus providing a link between abnormal placentation and maternal vascular abnormality. In this investigation, we examined the expression and secretion of a pro-angiogenic molecule VCAM-1, a member of the immunoglobulin superfamily with or without hypoxia in placenta

Methods: Functionally active term placental explant culture and trophoblast cultures were used to demonstrate the secretion profile of VCAM-1 and the real-time quantitative RT-PCR technique was employed to demonstrate the mRNA expression under both normoxic and hypoxic conditions

Results: A significant decrease in the secretion ($P < 0.05$) and mRNA expression ($P < 0.03$) of VCAM-1 from both term placental explants and trophoblast cultures subjected to hypoxia in vitro was observed

Conclusion: Since the primary defect in uteroplacental insufficiency is placental maldevelopment probably associated with hypoxia in situ, this study provides molecular evidence to indicate that the decreased expression and secretion of VCAM-1 could have an important role in pathological conditions such as pre-eclampsia and IUGR