Efficacy of a Short 18-Session Inpatient Rehabilitation Programme for Chronic Respiratory Diseases

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Aim: It is well established that pulmonary rehabilitation programmes improve exercise capacity and quality of life in patients with chronic lung diseases. However, our patients find travelling 3 times a week to an outpatient facility logistically difficult. This study examines the efficacy of a short intensive inpatient rehabilitation programme.

Methods: Fourteen male patients (10 with COPD, 2 with bronchiectasis, 2 with interstitial fibrosis) aged 64.9 ± 10.6 years were recruited over an 11-month period. All patients underwent lung function tests (as tolerated), 6-minute walk test, and 3 quality of life questionnaires on admission, namely SF-36, Chronic Respiratory Disease Questionnaire (CRDQ) and St George's Respiratory Questionnaire (SGRQ) (the latter 2 are specific for patients with respiratory diseases) – these were repeated on completion of the programme. Each patient underwent 2 sessions of physical therapy daily, for a total of 18 sessions over the 10 to 14 days of hospital stay. Each session consisted of a 5-minute warm-up, 30 to 40 minutes of aerobic exercises, and strengthening exercises using elasticity-graduated Theraband® and free weights.

Results: Paired analysis was performed, with P <0.05 considered significant. All quality of life variables showed improvement except for the emotional aspect of CRDQ. Six-minute walk test results also showed a significant improvement of 29.5 m. Only FEV1 remained unaltered after rehabilitation.

Conclusion: We hence conclude that a short 18-session intensive inpatient pulmonary rehabilitation programme is able to improve 6-minute walk test distance and quality of life for patients with chronic respiratory diseases and thus is an alternative to the conventional outpatient programme in Singapore General Hospital.

The Impact of a Paediatric Ambulatory Antibiotic Service: A Cost Analysis and Health-related Quality Of Life Study

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Aims: To conduct a cost analysis comparison based on the hospital's and patient's perspectives and to measure changes in HRQoL for paediatric patients selected for the ambulatory antibiotic pump service.

Methods: A single-centre, prospective investigation was conducted at KK Women's and Children's hospital over a 9-month study period. Demographics and resource utilisation data (health professional labour, laboratory and diagnostic tests, antimicrobials, and catheter placement) were collected from consenting patient samples selected for the outpatient service over the evaluation period. Cost reduction was estimated via retrospective chart review by the investigators. Costs were retrospectively assigned to each resource and the total cost saved was determined from each perspective. These patient samples also completed paired Paediatric Quality of Life Inventory™ Version 4.0 (PedsQL™ 4.0) questionnaires prior to discharge from the hospital and again 2 to 7 days after discharge.

Results: Ten patient samples of ages 2 to 18 years were enrolled for the study. The mean cost per treatment day saved based on the hospital perspective was S$437.58, and the mean cost per treatment day saved based on the patient perspective was S$286.81. Sensitivity analyses revealed the results to be robust to plausible changes. Study patient samples also experienced a significant overall HRQoL improvement (P <0.05) in the PedsQL™ 4.0 Generic Core Scales (Physical, Emotional, Social, and School functioning status) when they were transferred from the hospital (mean total score, 52.9) to home setting (mean total score, 71.1).

Conclusion: This study reveals that the ambulatory antibiotic pump service can substantially reduce healthcare costs and improve HRQoL in the Singaporean paediatric population setting.

Diagnostic Quality of Breast FNA in Changi General Hospital – An Inter-institutional Comparison

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Aim: To evaluate the diagnostic accuracy breast fine needle aspiration cytology in Changi General Hospital and to compare it with other regional hospitals.

Methods: Eight hundred breast cases (800) in 796 females and 4 males from January 2003 to December 2004 were studied. Of the 27 malignant cases, 5 did not come for a surgical follow-up. A total of 230 patients had subsequent excision and they form the basis of comparison in this study.

Results: Of 800 cases, 147 (18.37%) were unsatisfactory and subsequent histologic examination was performed on 230 cases. The results were compared based on rates of diagnostic accuracy, sensitivity, specificity, positive predictive value and negative predictive value. The leading cause of false negative diagnosis, as well as high unsatisfactory rates, is poor FNA sampling technique.

Conclusion: The results of our study are comparable to those published by the National University Research Institute of Medical Sciences, Republic of Korea, Istanbul University, Istanbul Medical School and the inter-institutional performance comparison put out by the College of American Pathologists.

An Investigation of Haemodynamics during Graded Neuronal Activity

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Aim: To examine the linearity of the relationship between cerebral blood flow (CBF), volume (CBV), metabolic rate of oxygen ($CMRO_2$) and the blood oxygen level-dependent effect (BOLD) over graded visual stimuli.

Methods: Six healthy volunteers (5M, 1F; age 29.7 ± 1.6) were presented with graded visual stimuli (flashing checkerboard with 3 contrast levels – 100%, 50%, 25%) and simultaneously scanned on a clinical 3T imager, using 2 functional imaging sequences, vascular space occupancy (VASO) and BOLD. VASO: TI 90ms, TE 12ms, flip angle 90º. BOLD sequence: TE 35ms, flip angle 90º. Both sequences: TR 3s, slice thickness 5 mm, FOV 224 x 224 mm. Realignment and drift removal were done. T-tests were performed voxel-by-voxel to determine significant activation. Only commonly activated voxels were further analysed. CBF was estimated from CBV data using Grubb's equation. Oxygen extraction fraction (OEF) and $CMRO_2$ was calculated using equations from literature.

Results: CBV returned to baseline 10 s to 12 s after stimuli cessation, while BOLD took 30 s to 35 s to reach baseline from its post-stimulus undershoot. Calculated OEF values demonstrated post-stimulus

elevated levels (0.4-0.47) for 30-35s. Across the different visual contrasts, $CMRO_2$ stayed relatively constant, whereas CBV and BOLD increased, though BOLD appeared to saturate before the 100% contrast level.

Conclusion: Popular thought is that neuronal activity causes vasodilatation via increased energy demand. Our results suggest otherwise: After haemodynamics returned to baseline post-stimulus, OEF remained elevated. Furthermore, BOLD saturated before CBV during graded stimulus, while $CMRO_2$ remained constant. Hence, oxygen use does not appear to be coupled to its delivery via CBV and CBF.

Evaluation of Paperless Process in the Improvement of Efficiency and Effectiveness in Radiation Therapy Application

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Aim: To evaluate the improvement of efficiency and effectiveness in radiation therapy application after the introduction of a paperless process in the department.

Methods: This is a study involving the comparison and measurement of the department work processes before and after the implementation of the patient treatment network system and how the paperless process as a result of this system has improved the efficiency and effectiveness in the overall management of radiotherapy. There will be a discussion on how the paperless system has changed the concept of radiation treatment and services, and information management.

Results: It is faster and more accurate for staff in different disciplines to carry out online communication, instead of depending on one source of paper records. Human errors, which could occur when carrying out manual recording, can now be prevented with the treatment verification system. The problem of the possibility of missing treatment records is now totally eliminated. There is a foreseeable reduction in the need for storage space.

Conclusion: The whole arena of radiation therapy application and management has changed as a result of the introduction of the treatment information network system. Upheavals arising from changes in management are unavoidable; we have faced the challenge well and will strive for continual improvement.

Evaluation of Direct Antimicrobial Susceptibility Testing and Biochemical Tube Identification Performed from Positive Blood Culture Vials

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Aims: The prompt availability of positive blood culture results influences therapeutic choices and morbidity outcome in septicaemia. This study aimed to establish the accuracy of performing direct antimicrobial susceptibility testing (AST) and biochemical tube identification of bacteria from broth dilutions of positive blood cultures.

Methods: Ninety-three positive blood cultures with *Staphylococcus aureus*, *Escherichia coli* and *Klebsiella* species were included in this study. Direct AST and inoculation of biochemical tubes were performed from a 6-fold dilution of fluid aspirated from a positive blood culture vial. Reference AST and confirmatory bacterial identification were performed the next day from overnight colonial growth on solid-media. Discrepancies between the 2 methods were categorised into minor, major and very major errors.

Results: No very major or major errors were recorded. There was 100% concordance between AST methods for *S. aureus*, except for a minor error rate of 13% for ciprofloxacin and 6% for gentamicin. Direct AST of *E. coli* and *Klebsiella* sp. demonstrated <5% minor errors for all tested antibiotics except amikacin (30%), amoxycillin/clavulanic acid (13%) and piperacillin/tazobactam (25%). Bacterial identification using the tube identification method proved as reliable as the reference method, with no discrepancies reported.

Conclusions: The direct AST and tube identification method produced clinically reliable and acceptable results. These methods expedite result availability by 24 hours, improve laboratory workflow and decrease operational costs.

Real-time 3D Echocardiography Examination of the Mitral Valve in the Presence of Significant Regurgitation

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Aim: Two-dimensional echocardiography (TTE) assessment of any diseased mitral valve requires an excellent knowledge of its anatomy. We aimed to evaluate the cumulative role of real-time 3D echo in the assessment of mitral valves.

Methods: Patients with moderate-to-severe mitral regurgitation had 2D and 3D assessment for their mitral valve. Three independent expert observers blinded to the reported 2D findings were shown 3D atrial en-face slices of the valve. The location and extent of the diseased segments by 3D was scored.

Results: Twenty-five patients (mean age 50; range, 18 to 78 years) with structural or ischaemic reasons as the cause of mitral regurgitations were analysed. Optimal 3D image was obtained for all parasternal datasets of the valve. Reconstruction of the atrial en-face slices was easy and rapid, and was usually completed within 1 to 2 minutes. An excellent agreement was also observed between the 3D and 2D examinations. In the assessment of prolapsed valves, a specificity of 88% and sensitivity of 60% was observed. Specificity and sensitivity of 100% was obtained in flail valves.

Conclusion: Real-time 3D echo yields anatomic information comparable with conventional echocardiography with specificity and sensitivity values expected to improve with a larger sample size. Following the introduction of the IE33 by Phillips Medical in the beginning of 2005, and its ability for rapid volumetric data acquisition, 3D echocardiogram has become a routine in our laboratory whenever in-depth assessment of the mitral valve is required.

Clinical Evaluation of the Pharmacia Technis ZM 900 Multifocal Intraocular Lens

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Aim: To evaluate the efficacy of the Pharmacia Technis ZM 900 multifocal intraocular lens (IOL).

Methods: Following appropriate counseling, patients were selected for cataract extraction with the insertion of the Pharmacia Technis ZM 900 multifocal IOL. Patients with significant ocular pathologies were excluded. All cases were performed by a single surgeon using a standard phacoemulsification technique under topical anaesthesia. Patients were reviewed on the first day, first week, first month and third month after surgery. Parameters assessed at the postoperative visits included unaided near and distance visual acuities (VA), best spectacle-corrected near and distance VA, contrast sensitivity (CS) in

photopic and mesopic conditions as well as dilated aberrometry assessments. Subjective assessments were performed using a Quality of Life (QOL) questionnaire at month 1.

Results: At the time of this abstract, 5 eyes of 5 patients had had the described procedure. At 1 week, all patients had unaided distance VA of 6/9 or better and best spectacle-corrected distance VA of 6/6 or better. All patients also had unaided near VA of N5. At 1 month, these results were maintained. Contrast sensitivity testing using Sine Wave grating methods demonstrate normal CS values in all spatial frequencies under photopic conditions and 25% lower values in all spatial frequencies under mesopic conditions. Subjective responses to the QoL indicate that all patients had good visual and optical satisfaction with the Technis ZM900 IOL. All patients are also spectacle-independent for near and distance.

Conclusion: These early results seem to indicate that the Technis ZM 900 multifocal IOL is a safe and effective choice for multifocal requirements following cataract surgery. It can provide all our patients with good unaided near and distance VA, enabling them to be spectacle-independent.

The Acquisition of Mandarin Classifiers in Preschool Children

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Aim: This preliminary study aimed to explain the acquisition of 13 common Mandarin classifiers in pre-school Mandarin speaking children in Malaysia. They were 个/ *'ge'*, 本/ *'ben '*, 粒/ *' li '*, 张/ *'zhang'*, 辆/ *'liang'*, 条/ *'tiao'*, 支/ *'zhi'*, 把/ *'ba'*, 块/ *'kuai'*, 片/ *'pian'*, 卷/ *' juan'*, 盒/ *' he'* and 棵/ *'ke'*. A classifier is a word that must occur with a number and/or a demonstrative, or certain quantifiers before the noun. The objectives of this study were to determine the age of emergence, the age of stabilisation and the order of acquisition. The false responses from the children were analysed as well.

Method: Forty subjects aged from 3 to 6 years old were used in this study. They were divided into four age groups that each group consisted of 5 females and 5 males. The children's comprehension of these classifiers was tested.

Results: The current findings showed that children start to comprehend classifiers at an earlier age, i.e., at 3 to 4 years. The age of stabilisation was at 4 to 5 years.

Conclusion: The order of acquisition was concurrent with the implicational order of the acquisition of dimension concept. The classifiers that involved 3-dimensional objects were acquired first. The classifiers that were used for 2-dimension objects were acquired much later. The false response analysis revealed that children aged 5 to 6 years showed more matured cognitive thinking in their choice of responses.

Detection and Management of Patients at Risk of Malnutrition

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Aim: Malnutrition has been well documented amongst hospital inpatients. Malnutrition has been shown to increase morbidity and mortality and to increase length of stay. In our hospital, we found that 34.5% of admitted patients were at risk of malnutrition. Only 20.7% of these patients were referred to dietitians for further intervention. We aimed to increase the percentage of admitted patients at risk of malnutrition referred to dietitians from 20% to 90%.

Methods: The study patient population consisted of Alexandra Hospital general ward inpatients between 1 July 2004 and 30 September 2004. A simple-to-use survey form was designed and a new referral process was developed. The new referral process allowed nurses to refer to dietitians, thus freeing up the doctors. All staff in the hospital underwent education sessions regarding the new referral process and simplified survey forms.

Results: After the new referral process was implemented, a survey of 1657 patients was conducted at admission. It was found that 400 (24.2%) patients were at risk of malnutrition. 85.6 per cent of the patients at risk of malnutrition were referred to dietitians for further intervention.

Conclusion: A simple-to-use nutrition survey form and a new referral process are useful in detecting patients at risk of malnutrition. Adequate training and education are important in increasing compliance with the new malnutrition detection protocol. Strategies to sustain this improvement have been developed, but continued work concerning malnutrition in hospital inpatients is necessary.

Factors Affecting Low Participation Rates in Outpatient Cardiac Rehabilitation Programmes in National University Hospital, Singapore

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Aim: Cardiac rehabilitation programmes (CRPs) have been shown to promote a healthy lifestyle, facilitating the control of risk factors and compliance with medications among patients following a cardiac event. They are thus crucial tools in the secondary prevention of coronary heart disease (CHD). CRPs comprise an inpatient stage (Phase I) and an early outpatient phase held from 2 to 6 weeks post-discharge (Phase II), comprising patient education and exercise sessions. However, the majority of eligible patients do not participate in CRP. This study aimed to determine the factors affecting low participation rates in CRP in National University Hospital (NUH), Singapore.

Methods: A consecutive series of 935 patients with acute myocardial infarction (AMI), and/or undergoing percutaneous coronary intervention (PCI), over 1 year (January 2004 to December 2004) at NUH, Singapore, received Phase I CRP. They were evaluated for subsequent attendance at Phase II CRP.

Results: Five hundred and thirty patients were identified as being eligible to attend; the average age was 56 years (range, 22 to 83 years). There were 418 (79%) males. One hundred (19%) patients participated in Phase II at least once, out of 12 sessions and 430 (81%) patients opted not to attend. There were several reasons cited by those who did not participate: 224 (52%) gave work-related reasons (fear of dismissal, lack of time due to work schedule), 106 (25%) cited the inconvenience of traveling to hospital (related to distance and programme duration), while 100 (23%) cited a preference for performing their own physical exercises.

Conclusion: The dominant reason for failure in participating in Phase II CRP appeared to be the fear of losing one's job.

Nutritional Status and Hospitalisation Outcomes of Patients with Advanced Metastatic Cancer Referred for Nutritional Intervention in a Tertiary Hospital in Singapore

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Aim: Malnutrition is prevalent among hospitalised patients, especially in patients with advanced metastatic cancer. We prospectively compared the nutritional status and hospitalisation outcomes of patients with advanced cancer referred for nutritional intervention in a tertiary hospital in Singapore.

Methods: We included patients with advanced metastatic cancer admitted to the oncology ward at the National University Hospital, Singapore between January 2004 and January 2005. Nutritional status was assessed using subjective global assessment (SGA), body mass index (BMI) (weight/height^2), serum albumin and total lymphocyte count (TLC). A patient was considered malnourished if SGA <6, BMI <18.5 kgm^2, serum albumin level <35 g/L and TLC <1.5 x 10^9/L. Hospitalisation outcomes included the length of hospital stay, death and readmissions. Univariate, multivariate and Spearman's correlation analysis were used to compare the nutritional status and hospitalisation outcomes.

Results: Ninety-seven patients of mean age 59 ± 12.8 years were included in this study. Ninety-two (94.8%) patients had an SGA score of <6; 73 (75.3%) had BMI <18.5 kgm^2; 38 (39.2%) had serum albumin level <35 g/L; and 75 (77.3%) had TLC <1.5 x 10-9/L. SGA correlates positively with BMI (r = 0.631, r <0.001), and negatively with death (r = 0.230, *P* = 0.023). Using multivariate analysis, age, BMI, serum albumin and TLC were found to be not useful in predicting hospitalisation outcomes.

Conclusion: The high proportion of malnourished patients in this study may be explained by the late referral of patients for nutritional intervention. Early identification of patients at risk of malnutrition is important in reducing the higher morbidity associated with this significant reversible clinical entity.

Surface Expression of Heat Shock Proteins following UV Exposure or CD40 Stimulation in Multiple Myeloma (MM) Cells Increases their Antigenicity and may Lead to the Development of an Effective Anti-MM Vaccine

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Aim: To investigate the effects of CD40L and UV irradiation on the surface expression of heat shock proteins (HSP) in MM cells and to develop an autologous HSP-based cellular vaccine from MM cells that efficiently primes a patient's own T cells.

Methods: UV- or CD40-activated MM cells were analysed by flow cytometry for surface-expressed Grp78 and Grp96. Immunoblotting as well as real-time reverse transcriptase PCR were also used to determine whole cell protein and RNA expression for the 2 HSPs. After determining the optimal expression of HSPs, the cells were used as an antigenic source to prime human T cells in vitro. Cytotoxic T cell and IFN-γ assays confirmed the functional nature of the activated tumour cellular material to stimulate anti-MM T cell responses.

Results: UV irradiation of MM cells resulted in an increase in total HSP expression whereas CD40 stimulation resulted in increased surface expression of HSPs only. Furthermore, repeated priming with UV-irradiated MM cell lines of T cells obtained from healthy donors resulted in an increase in the number of activated CD8+ T cells in vitro. When these T cells were used in a redirected CTL assay, they efficiently lysed MM cells in vitro. Finally, the addition of the HSP-peptide inhibitor resulted in a significant decrease in cytolysis.

Conclusion: Using this strategy, our hope is to develop an autologous vaccine using HSP-expressing MM cells and T cells from a patient with multiple myeloma via a "personalised medicine" approach.

In Vivo and Ex Vivo Expansion of Cord Blood for Transplantation

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Aim: To study the effectiveness of in vivo and ex vivo strategies for increasing cord blood cell numbers for transplantation.

Background: Mismatched umbilical cord blood for the treatment of haematological malignancies has proved to be as effective as the transplantation of fully matched bone marrow from unrelated donors. However, due to the limitation in the number of cells in cord blood, the use of this procedure is often limited to paediatric patients.

Methods: We present the interim results of 2 cord blood expansion strategies. Ex vivo expansion of cord blood cells in a closed bag system, enabling rapid translation into clinical use, and in vivo expansion for the delivery of cord blood cells directly intra-bone marrow, being an optimal site for growth and expansion in vivo. We will discuss the interim results of intra-bone marrow injections for the facilitation of cord blood engraftment in Cynomolgus monkeys (*Macaque fascicularis*).

Results: Ex vivo expansion cultures were established with CD34+ cells in Teflon culture bags with 50 mL Stemline II expansion media (Sigma) containing 100 ng/mL of SCF, G-CSF and MGDF produced an average expansion of 112-fold in total cells, 72.6-fold in GM- and progenitor cells (GM-CFC and BFU-E). Intra-bone marrow injections carried out have been well tolerated by the recipient monkeys. Results of engraftment of donor stem cells will be presented.

Conclusion: Ex vivo expansion of cord blood can be done safely in a closed bag system. In vivo implantation of bone marrow and cord blood can be done safely and could deliver blood stem cells directly to an optimal site for growth.

p53-dependent Activation of DNA Damage Signalling by Celecoxib in Human Glioblastoma Cells

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Aim: Cyclooxygenase (COX) inhibitors have shown efficacy against a range of tumours. We sought to define the underlying antineoplastic mechanisms of celecoxib (a selective COX-2 inhibitor) in human glioblastomas by determining whether celecoxib induces DNA damage, leading to cell cycle arrest, and whether this effect is dependent on p53 activation.

Methods: In U87 (wild-type p53) and U251 (mutant p53) cells, using Comet assay, we studied celecoxib-induced DNA damage. In U87, U251 and E6 (which degrades p53)-transfected U87 cells, cell cycle progression by celecoxib was assessed by flow cytometry analysis on propidium iodide-stained cells. We further verified activation of p53 by analysing total p53 and phospho-p53 Ser15 proteins, and G_1 cell cycle arrest by measuring p21 and p27 proteins.

Results: Five and 24 hours of celecoxib (8 and 30 μM) significantly induced DNA damage in U87 (1.3- to 2.7- fold) and U251 (0.7- to 1.3- fold) cells ($P < 0.05$). In U87 cells, celecoxib (30 μM, 18 hours) significantly arrested G_1 phase cells (66.2 ± 2.6%), compared to controls (56.1 ± 1.3%; $P < 0.05$), which was supported by increased p21 (and not p27) proteins. Cell cycle progression was not affected by celecoxib in U251 and E6-transfected U87 cells. Total p53 and phospho-p53 Ser15 were increased by celecoxib (8 μM and 30 μM) at 5 and 18 hours in U87 cells.

Conclusion: Detailed understanding underlying anti-tumour mechanisms of celecoxib holds promise for novel therapeutic approaches to glioblastoma multiforme. Our study showed that celecoxib induces DNA damage in human glioblastomas, leading to G_1 cell cycle arrest dependent on p53 activation.

Saliva Analysis in the Early Detection of Oral Cancer using Surface-enhanced Raman Spectroscopy (SERS)

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Aim: Currently in Singapore, the 5-year survival rate of oral cancer is about 50%, which is very low. In this pilot study, we evaluate the applicability of surface-enhanced Raman spectroscopy (SERS) in the detection of oral cancer-related chemical changes in the saliva, with the aim of developing a rapid and easy-to-use diagnostic tool for oral cancer. SERS is a technique that involves the combined use of optical spectroscopy and metallic nano-structures, and has been reported to be a promising tool for analysing chemical changes in complex fluidic samples.

Methods: Saliva samples were collected from oral cancer patients and healthy individuals. The raw samples were then subjected to

centrifugation at 15,000 rpm for 5 minutes to remove food particles and exfoliated cells. Subsequently, the supernatants were extracted and analysed using SERS.

Results: Differences were seen between the saliva SERS spectra derived from the abnormal (i.e., from oral cancer patients) and normal saliva samples. In particular, a number of bands were uniquely expressed in the SERS spectra of the abnormal saliva. Of these bands, 1 was reported in a previous Raman study of cancerous oral tissues.

Conclusion: SERS may be a suitable technique for diagnosing oral cancer. It requires little sample preparation and may lead to a miniaturised diagnosis system.

Biochemical Characterisation of Radiosensitive Cell Lines Derived from Adult Cancer Patients with Late Radionecrosis

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Aim: Normal tissue toxicity limits the dose of radiotherapy delivered. Factors accounting for inter-individual differences in normal tissue tolerance to radiotherapy are largely unknown. To date, molecular defects in radiosensitivity-associated human syndromes and mutant mammalian cell lines are found in DNA double strand breakage (DSB) and other DNA damage response pathways. Non-homologous end-joining (NHEJ) has been particularly implicated. The aim of this study was to investigate possible abnormalities in these DNA damage responses in radiosensitive cell lines derived from patients who developed late radiation necrosis after conventional curative radiotherapy.

Methods: Epstein-Barr virus-immortalised lymphoblastoid cell lines (LB0003, LB0004 and LB0005) were established. These were investigated for in vitro postradiation viability and DNA DSB rejoining ability. Expression and activity of proteins involved in DNA DSB repair and damage response were also measured.

Results: Compared with controls, all 3 cell lines demonstrated in vitro radiation sensitivity and reduced ability to rejoin radiation-induced DNA DSBs. LB0003 and LB0004 also exhibited reduced in vitro activity of DNA-dependent protein kinase (DNA-PK), a key heterotrimeric complex mediating NHEJ. Experiments are underway to elucidate the mechanism of reduced DNA-PK activity in the 2 cell lines. Preliminary data implicate abnormal protein-protein interactions in the heterotrimer.

Conclusion: Reduced DNA-PK activity may be an important intrinsic factor affecting the predisposition of radiotherapy patients to late radionecrosis.

Cultivation and Characterisation of Human Epidermal Stem Cells for Skin Tissue Engineering

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Aims: To cultivate and characterise the human epidermal stem cells, and to identify the putative molecular markers and use them for composite skin tissue engineering.

Methods: Ten human skin and hair follicle samples were harvested from plastic operations. Human tissues were frozen for preparing frozen sections; epidermal keratinocytes and hair follicle cells were trypsined from skin and hair follicle, and serially cultivated in 3T3 feeder layer culture system. The expression of potential markers in skin and hair follicle was investigated with immunofluorescent staining, western blotting, RT-PCR and colony forming efficiency.

Results: Potential molecular markers keratin 15, b1 integrin, p63, and ABCG2 were present in the basal layer of skin epidermis and hair follicle bulge, and in in vitro culture, these cells show great proliferation capacity and colony-forming efficiency.

Conclusion: Epidermal stem cells exist in the basal layer of human skin epidermis and hair follicle bulge respectively, these cells show great proliferation capacity and colony-forming efficiency in vitro. Cytokeratin, b1 integrin, transcript factor p63 and ABCG2 can identify epidermal stem cells, but there is no specificity for any of these markers. There is great potential in the use of epidermal stem cells for the tissue engineering of composite skin, for use in extensive burns and other clinical conditions requiring skin replacement.

Essential Hypertension in Singaporeans: Endothelial Nitric Oxide Synthase Genotype Association

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Aim: Vascular endothelial cells produce nitric oxide (NO), which contribute to the regulation of blood pressure and regional blood flow. Although endothelial nitric oxide synthase (eNOS) gene polymorphisms have been shown to have positive association with coronary artery disease, the linkage between eNOS gene polymorphisms and essential hypertension has been controversial. We examined eNOS gene polymorphisms in Singaporeans.

Methods: A total of 103 individuals with essential hypertension and 102 normotensive control subjects were studied. The specific genotypes for Glu298Asp missense variant in exon 7, variable number tandem repeats (VNTR) in intron 4 (eNOS 4a/4b), and T-786C in the promoter were isolated using allele specific gene amplification and restriction fragment length polymorphism.

Results: The overall distribution of allele frequencies differed significantly between the 2 groups, with five-repeat allele of intron 4 more frequent in hypertensive group than in the normotensive group (P <0.05). Moreover, intron 4b/b genotype significantly correlated with hypertension (OR, 1.8; 95% CI, 0.9 to 3.4). However, disequilibrium of Glu298Asp and T-786C was absent between the 2 groups.

Conclusion: Our results suggest that eNOS 4b/b is a genetic susceptibility factor for essential hypertension in Singaporeans.

Neurite Outgrowth Inhibitors in Axon-Glial Communication at Central Nervous System Nodes of Ranvier

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Aim: How the organisation of the nodes of Ranvier and abutting domains in myelinated axons is regulated by glial cells remains poorly understood. This study aims to investigate the roles of several oligodendrocyte-derived proteins in organising axonal domains.

Methods: Central nervous system (CNS) tissues, including brain and

spinal cords from normal or demyelinating animal models, were collected. Immunohistochemistry and electron microscopy were used to visualise structures and protein distribution. Several methods, including immunoprecipitation (IP), GST pull-down assay, and cell repulsion assay, were combined to explore protein-protein interactions.

Results: In this study, oligodendrocyte-myelin glycoprotein (OMgp) and Nogo-A are identified as clusters in the nodal and paranodal domains, respectively. In the CNS, OMgp is involved in a network of interactions with other nodal molecules, including Nav channel subunits and TN-R. Downregulation of OMgp in the transgenic mice causes hypo-myelination, disorganised nodal structure and decreased expression of Nav channel subunit. By contrast, no abnormality of nodal organisation has been observed in TN-R knock-outs. In vitro, OMgp protein has no effects on Nav channel distribution and sodium currents. Paranodal Nogo-A interacts with Caspr/paranodin via the Nogo-66. In demyelinating models such as the experimental autoimmune encephalomyelitis (EAE) rats, the ceramide galactosyltransferase (CGT) and myelin basic protein (MBP)-deficient mice, disruption of Nogo-A-Caspr interaction leads to misplacement of Kv1 channels.

Conclusion: The results have demonstrated that in addition to inhibiting neural regeneration, the myelin-associated molecules undertake specific roles of regulating axonal polarity and functions.

Angiopoietin-1 Improves and Sustains Regional Reperfusion in Swine Chronic Myocardial Ischaemia

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Aim: Vascular endothelial growth factor (VEGF) and angiopoietin-1 (Ang-1) are major angiogenic factors in developing hearts. This study compares the long-term angiogenic effect of VEGF and Ang-1 in swine chronic myocardial ischaemia.

Methods: Swine chronic myocardial ischaemia was created by occluding left circumflex coronary arteries using ameroid constrictors. Animals were randomised to receive recombinant adenoviral vectors carrying Ang-1, VEGF or empty vector. Left ventricular myocardial blood flow was determined immediately before treatment, at 4 and 12 weeks after treatment using fluorescent microsphere technique. Microvascular density was quantified and compared at the end of experiment. Expression of hVEGF and hAng-1 mRNA was monitored at 1, 3 and 4 weeks post-gene transfer in a separate experiment. Dobutamine stress echo was performed before therapy, at week 4 and week j12 after therapy.

Results: Left ventricular perfusion in animals that received Ang-1 was significantly improved at 4 and 8 weeks compared to VEGF and empty vector groups. Microvascular densities in the left ventricles of animals that received Ang-1 and VEGF were significantly higher than animals that received empty vector or in healthy animals. Dobutamine stress echo showed that myocardial velocity at the peak dose of dobutamine for animals that received Ang-1 was significantly higher than the other groups.

Conclusion: Adenoviral gene transfer of Ang-1 and VEGF resulted in increased angiogenesis but only Ang-1 showed sustained improvement in left ventricular perfusion of the ischaemic myocardium by promoting functional neoangiogenesis. Intramyocardial delivery of Ang-1 is useful for the revascularisation of chronic ischaemic myocardium.

Quantitative Telomerase by Novel RT-PCR Technology Predicts Nodal and Distant Metastases and Prognosis in Breast Cancer

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Aim: Telomerase is a chromosomal enzyme portending immortality. We correlated telomerase expression (TEL) in breast tumours with clinical staging variables and survival following standard treatment.

Methods: TEL was assayed by quantitative RT-PCR in 223 snap-frozen breast cancer specimens, and quantified as relative activity (RTA) to MCF-7 cell-line. Patient staging (AJCC-6) was based on medical records. All had standard institutional treatment. One hundred and ninety-two cases with >2y f/u were evaluated for survival. TEL correlated with nodal (N+) or distant metastases (M+), hormone receptor status (HR), progression-free survival (PFS) and overall survival (OS).

Results: Stage breakup was I (23), II (128), III (53), and IV (19). Forty-seven had no chemotherapy and 136 had risk-adjusted chemo. One hundred and fifty-three patients were HR+, and 132 were N+. With a median f/u of 40 months (range, 24 to 95 months), 53 deaths occurred and 107 remained disease-free. TEL ranged from 0 to 119.5 RTA. Eleven were TEL-negative (= 0; NoTEL), 110 were low expressors (0 to 10; LoTEL) and 113 had high expression (>10; HiTEL), of which 68 were very high (>20; VHiTEL). Compared with LoTEL, HiTEL were more likely to be N+ (77 versus 36; χ^2 test, P <0.05), HR (54 versus 16), lower 2-year PFS (60% versus 86%) and OS (80% versus 97%) (χ^2 test, each P <0.001). VHiTEL predicted M+ (12/68 versus 7/148, Fischer's exact test, P = 0.003). By linear regression analysis, TEL was higher in HR-, M+ and higher stage (regression coefficient, -11.2, 10.74 and 5.3 respectively, all P <0.01). NoTEL were less likely to need chemotherapy (Fisher's exact test, P <0.05).

Conclusion: TEL is a poor prognostic marker and predicts N+ (in HiTEL) and M+ (in VHiTEL), allowing patient selection for nodal dissection, metastatic survey and risk-appropriate chemotherapy.

Differential Expression of E4SV and Wild-type *Parkin* in Sporadic Parkinson's Disease

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Aim: To investigate the expression of E4SV/wild-type *parkin* in the leukocytes of sporadic Parkinson's disease (PD) patients and healthy individuals.

Methods: There were 80 PD and 80 controls. Total RNA from human peripheral leukocytes was isolated following the manual instructions (Promega). Total RNA from human substantia nigra was purchased from Ambion. Quantitative polymerase chain reaction (PCR) was performed using the real-time TaqMan PCR method. TaqMan probes were designed at the junction of exons 3-4 (wild-type *parkin*) or exons 3-5 (E4SV).

Results: A *parkin* exon 4-spliced variant (E4SV) was identified from the human peripheral leukocytes and brain. The reading frame was

shifted over the junction and a stop codon (tga) appeared just 17-bp downstream from exon 3. A similar splicing was also found in the controls.The results of TaqMan real-time PCR demonstrated that the expression level of wild-type *parkin* was lower in PD patients (P <0.05) while the expression level of E4SV increased modestly. These changes in the expression levels of wild-type *parkin* and E4SV in PD patients lead to a significantly increased ratio of E4SV to wild-type *parkin* expression (P <0.0005).

Conclusion: There was an increase of E4SV and a significant reduction in wild-type *parkin* expression, with a net result of increased E4SV/wild-type expression ratio in PD patients compared to healthy controls. The E4SV corresponds theoretically to a genomic heterozygous exon-4 deletion, leading to a truncated protein devoid of the RING-functional domains and hence with total loss of enzymatic activity. At any given age, there was a significant difference in the ratio of E4SV/wild-type *parkin* between PD and controls. The ratio of E4SV/wild type increased with age in PD patients only.

The Hong Kong-Singapore Acute Lymphoblastic Leukaemia 97 Protocol – Results from a Single Centre

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Aim: Our centre has been using the Hong Kong-Singapore Acute Lymphoblastic Leukaemia 97 (HK-SG ALL 97) protocol since June 2000. This protocol was based on the BFM 95 Study with modification. The aim of this study was to analyse characteristics and outcomes of ALL treated with the HK-SG ALL 97 protocol in a single centre.

Methods: We reviewed ALL patients diagnosed in a 4-year period (June 2000 to May 2004).

Results: There were 92 patients – 76% Chinese, 14% Malay, 7% Indian, and 3% others. This was in keeping with our population ethnic distribution. There were 52 (57%) boys. The median age at diagnosis was 4.6 years (range, 1.2 to 13.7). The median duration of follow-up was 32.3 months (range, 13 to 57). Central nervous system disease was present in 5/92 (5.4 %). Cytogenetic studies were successful in 86/92 (93.5%) – hyperdiploidy 19.8%, t(9;22) 4.7 % and t(4;11) 2.3 %. The patients were stratified into 3 groups: 42.4% Standard Risk (SR), 43.5 % Intermediate Risk (IR), and 14.1% High Risk (HR). To date, there were 14 (15.2%) relapses – 53.8% of which were from the HR group. Bone marrow was the commonest relapse site while CNS site alone formed only 3%. There were 6 deaths from relapse – 1 from IR and 5 from HR. There was no treatment-related mortality. The global 5-year overall survival (OS) and event-free survival (EFS) were 91.9% and 79.7 % respectively. When risk groups were compared, the OS were 100%, 94.1% and 61.5%; the EFS were 89.6%, 79.6% and 44.9% for SR, IR and HR respectively.

Conclusion: Our data showed promising results with the HK-SG ALL 97 protocol, comparable to other groups using similar protocols.

Photodynamic Therapy as a Promising Alternative for Palliative Treatment of Angiosarcoma

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Aim: Angiosarcomas are vascular tumours usually found in the head and neck. The conventional treatment for this malignancy is radical surgery followed by postoperative radiotherapy. However, this is often not feasible and may not give a good outcome, as recurrences are common. We present here photodynamic therapy (PDT) as a good alternative for palliative treatment of angiosarcoma.

Methods: In our initial study, we recruited 2 elderly men with multifocal angiosarcoma. PDT was carried out using the photosensitiser, Fotolon® (Haemato-science, Germany). This drug is a complex of chlorin e6 and polyvinylpyrrolidone. Fotolon was administered intravenously at a dose of 2.0 mg/kg to 3.0 mg/kg. Three to 4 hours after drug administration, the lesions were irradiated with a medical-grade laser at a rate of 60 mW/cm^2 to 150 mW/cm^2 for a dose of 100 J/cm^2 to 200 J/cm^2.

Results: There were no observable side effects during or after PDT and there were no complications arising from the treatment. Within 48 h of PDT, the treated lesions showed signs of necrosis. One month after PDT, the treated lesions formed dry scabs. By the second month, the scabs had fallen off at least once. As early as 4 months after PDT, the soft tissue had healed. Post-treatment assessment up to 1 year showed that Fotolon-PDT was effective in achieving local control of the disease.

Conclusion: Photodynamic therapy is a promising alternative for palliative treatment of angiosarcoma as it might be effective in achieving local control. It is safe and easy to carry out as an outpatient treatment modality.

Amelioration of Severe Insulin Deficiency in a Preclinical Model of Diabetes Mellitus by Implantation of Autologous Hepatocytes Modified for Regulated Insulin Secretion

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Aim: To test the feasibility of restoring insulin secretion in streptozotocin-induced diabetic pigs by implantation of autologous hepatocytes electroporated with a glucose-regulated human insulin cDNA construct.

Methods: Twelve 18-kg Yorkshire pigs were rendered diabetic with streptozotocin. Autologous hepatocytes (2 x 10^8 to 4 x 10^8) were isolated from a surgically resected liver wedge, and electroporated with a plasmid construct in which the expression of human proinsulin cDNA, modified for furin cleavage, was driven by a glucose-responsive promoter. Transfected hepatocytes were immediately re-implanted into the liver parenchyma of the same pig. Control diabetic pigs were implanted with autologous hepatocytes electroporated without plasmid. The effects of hepatocyte-based insulin replacement were assessed by serial metabolic and endocrine assays (see Results).

Results: For each therapeutic index, data (mean ± s.e.m) shown below compare treated diabetics with untreated diabetic controls during the first 4 weeks post-implantation (upper line), and up to 138 days post-implantation (lower line).

Fasting blood glucose (mM):

12.51±0.46 vs 20.40±0.52; P <0.0001
12.77±0.49 vs 18.79±0.93; P <0.0001

Body weight (kg):

19.0±0.3 vs 17.3±0.2; P = 0.0048
25.4±1.0 vs 17.4±0.3; P = 0.0004

Fasting human C-peptide (ng/mL):

0.38±0.03 vs 0.10±0.01; P <0.0001

0.29±0.02 vs 0.07±0.02; *P* <0.0001
Triglyceride (mM):
0.39±0.09 vs 1.63±0.22; *P* <0.0001
0.27±0.04 vs 0.51±0.09; *P* = 0.0061
Fructosamine (μM):
535.1±21.2 vs 654.7±35.0; *P* = 0.0032
620.1±20.0 vs 800.8±31.7; *P* = 0.0004
IVGTT (glucose AUC):
22039±626 vs 35468±1309; *P* <0.0001
21968±900 vs 31364±304; *P* = 0.0016
IVGTT (human C-peptide AUC):
50.47±2.21 vs 4.88±0.38; *P* <0.0001
46.33±1.60 vs 5.64±0.68; *P* <0.0001
IVGTT (porcine C-peptide AUC):
18.48±3.70 vs 14.49±1.34; *P* = 0.4247
16.78±1.05 vs 16.45±1.83; *P* = 0.8755

Conclusion: Autologous hepatocyte implants capable of glucose-regulated insulin secretion significantly improve hyperglycaemia and other metabolic indices in a preclinical model of human diabetes mellitus.

The Effect of Neostigmine on Survival, after *Naja sumatrana* (Black Spitting Cobra) Envenomation with Suboptimal Antivenom Therapy in Swiss Albino Mice

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Aim: Neuromuscular paralysis is the dominant acute mechanism of death from *Naja sumatrana* envenomation. Complete dependence on antivenom therapy is not practical due to the short supply, the need for specialised storage, the cost and the risk of anaphylaxis in as many as 52% of patients. Anticholinesterase therapy has been reported in other envenomations with variable results. The aim is to investigate the role of neostigmine on survival in mice.

Methods: Groups of 5 male Swiss albino mice were used. Each was given an intramuscular injection of 2 LD50 (111 μg) of *Naja sumatrana* venom. After 2 minutes, a suboptimal dose of ED50 (136.95 mg) of the Haffkine antivenom was administered intraperitoneally; i.e., ensuing death rate was 50% without further intervention. Group 1 received 3 doses of subcutaneous neostigmine 2.7 μg (100 μg/kg) at 10, 40 and 70 minutes. Group 2 received 2 doses of neostigmine at 10 and 40 minutes followed by saline. Group 3 received 1 dose of neostigmine at 10 minutes, saline at 40 minutes and 70 minutes. Survival was noted after 24 hours.

Results: Analysed by intention to treat, Group 3 demonstrated 100% survival, a significant advantage over Groups 1 and 2 ($P = 0.05$, log rank test). There was no significant difference in the weights of the mice in different groups ($P = 0.987$, one-way ANOVA).

Conclusion: Neostigmine lowers antivenom requirement and improves survival following *Naja sumatrana* envenomation. However, higher doses of neostigmine were associated with death. Neostigmine holds promise in a situation where the physician is faced with a snakebite victim and artificial ventilation is temporarily inaccessible.

Pim-1 Protein Expression in Breast and Colorectal Carcinomas: Biological Implications

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Aim: To describe and compare the nature of Pim-1 oncogenic-kinase expression in samples of formalin-fixed, paraffin-embedded colorectal and breast cancer tissue.

Methods: Using a newly developed monoclonal antibody (clone 19F7; MBL), we examined the Pim-1 protein expression pattern in normal colon and colorectal cancer (CRC; 90 tumour samples and 47 normal samples in a tissue array format), as well as in normal breast tissue and breast cancer.

Results: We show that Pim-1 is expressed in normal colonic mucosa in goblet cells. Strong expression of Pim-1 was identified in 11 out of 90 CRC. Expression did not correlate with the tumour grade or mucin-producing subtypes of tumour. In contrast to the expression of Pim-1 in a subset of CRC, we found no Pim-1 expression in any of the normal breast samples or invasive breast carcinomas investigated. Interestingly, Pim-1 expression is readily identifiable in breast ductal hyperplasia (6 out of 6 foci). Furthermore, strong expression was noted in an area of apocrine metaplasia and in a focus of apocrine carcinoma in situ; otherwise, all the other identified foci of carcinoma in situ (other than apocrine type) in the sections were negative.

Conclusion: Our results indicate that Pim-1 overexpression is not present in conventional invasive carcinoma of the breast. However, when aberrantly expressed in CRC, Pim-1 may play a role in tumorigenesis, and thus be a legitimate target for therapy. The discovery of Pim-1 expression in mammary ductal hyperplasia and in breast apocrine-related processes is significant, and deserves further investigation.

Dissecting the Tumour-related Proteome in Colorectal Cancer by Expression Proteomics Approach

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Aim: Colorectal cancer (CRC) is an aggressive tumour that has been traditionally resistant to pharmacotherapy. The aim of this study is to identify the proteins in colon tumour cells with significant abundance alterations and/or post-translational modifications, as the first essential step towards determining their roles in the signaling pathways that characterise the underlying tumorigenesis and pathogenesis.

Methods: Two-dimensional gel electrophoresis (2-DE), MALDI-TOF MS/MS, and NCBInr database interrogation were used for protein identification. Differential expression and localisation of proteins were analysed by immunohistochemistry.

Results: We identified 30 specific proteins showing significant alterations between the colorectal carcinoma and the adjacent normal colon. These proteins are known to be variously involved in cytoskeleton rearrangement, cellular defense, metabolism, cell cycle regulation, angiogenesis, RNA processing and translation. The upregulation of hnRNP A1, PD-ECGF, destrin and PCNA in CRC was further confirmed by immunoblotting and immunohistochemical (IHC) analyses. IHC staining showed that hnRNP A1 and PCNA were overexpressed and localised in both the nuclei and cytoplasm of the tumour cells, while PD-ECGF was expressed in the stromal cells and the surrounding noncancerous tissues in the cancer nest. Destrin was expressed in the stromal cells in normal colonic mucosa, but more so in the tumour cells. Several other proteins which have not been previously associated with CRC were also identified.

Conclusion: Our study demonstrates yet again the complementation of proteomics and IHC techniques in identifying and localising the differentially expressed proteins within the in vivo tumour microenvironment. These CRC-related proteins will add to the existing tumour-related protein database resources for exploring protein signatures and developing novel biomarkers and/or therapeutic targets.

A Spot of Tea, with your MRCP? In Vitro and In Vivo Evaluation of Popular Beverages as Alternative Oral Contrast Agents to Blueberry Juice in Magnetic Resonance Cholangio-pancreatography

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Aim: This study aims to evaluate the use of popular beverages as alternative negative contrast agents for the gastrointestinal tract in magnetic resonance cholangiopancreatography (MRCP), with comparison to blueberry juice as the current standard.

Methods: A search of the US Department of Agriculture Nutrient Database for Standard Reference was performed to identify juices and beverages that have a manganese or iron content similar to or greater than blueberry juice. In vitro studies were performed on potential drinks to determine which had suitable T2 relaxation times with blueberry juice as a reference. Based on these results, beverages with T2 relaxation times similar or less than blueberry juice were selected for spectroscopic analysis. In vivo studies were carried out on 10 healthy volunteers using these drinks. Each volunteer was given a beverage and the post-contrast MRCP was performed. The study was repeated for each volunteer using different beverages and qualitative assessment of pancreatobiliary tree visualisation was performed. Instant tea, Ovaltine, canned pineapple juice and fresh soya milk were chosen for their suitable T2 relaxation times.

Results: Spectroscopic analysis showed that Ovaltine and tea had the highest manganese ion concentration, while Ovaltine and soya milk had the highest iron ion concentration. Instant tea and Ovaltine were most effective in suppressing the high signal from the bowel and improving the visualisation of the pancreatobiliary anatomy, followed by pineapple juice and blueberry juice.

Conclusion: Instant tea, Ovaltine and pineapple juice are safe and effective alternatives to blueberry juice as negative oral contrast agents for nulling the high signal from adjacent bowel in MRCP.

Vesico-ureteral Reflux: Detection with Magnetic Resonance Cystography using Dynamic Bolus Tracking Technique: Initial Experience

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Aim: To evaluate the feasibility of using magnetic resonance (MR) as an imaging technique for detecting vesico-ureteric reflux (VUR).

Methods: This study received institutional review board approval, and written informed consent was obtained from all patients. A total of 6 patients (age range, 24 to 35 years; 5 females and 1 male) had VUR detected on fluoroscopic voiding cystourethrography (VCUG) and were recruited into the study. One patient was excluded when MR imaging revealed an intrauterine pregnancy. These yielded 10 kidney-ureter units (5 were normal, and 5 had VUR detected on VCUG). MR cystography was performed using a 1.5-T MR scanner (Symphony, Siemens Medical Systems). Patients were catheterised and gadolinium-enhanced saline was infused into the bladder. A gadolinium detection pulse sequence technique (care bolus, Siemens Medical Solutions) was used. This allowed real-time visualisation of images in the fluoroscopy window on the console as they were being obtained, which were used to detect VUR. When the contrast was seen refluxing into the urinary tract, a 3-dimensional (3D) MR gradient echoes sequence was triggered. The result was compared to VCUG.

Results: Correlations were noted between MR cystography and VCUG in 8 (4 were normal, and 4 had VUR) of the 10 kidney-ureter units (80%). There was discordance between the 2 techniques in the remaining 2 kidney-ureter units; 1 had VUR detected on MR cystography only, and the other on VCUG alone.

Conclusion: This novel MR cystography technique holds potential as a screening examination for diagnosing VUR. This technique does not involve ionising radiation and gives excellent anatomical depiction of the urinary system. A prospective study with a bigger cohort of patients would be useful in validating its accuracy, specificity and sensitivity.

Genetic Markers in Obstructive Sleep Apnoea

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Aims: Obstructive sleep apnoea (OSA) is a common condition with a high socioeconomic cost. It is a complex and multifactorial disease process. It has been established that OSA is associated with obesity, upper airway laxity, abnormal fat deposition and neurological causes. Familial aggregates have been documented in several studies, and several candidate genes have been proposed. However, few genetic studies have been done so far. The authors investigated the incidence of mutations in TNF – alpha, fibrillin, endothelin 1, connective tissue growth factor (CTGF) and nitric oxide synthase (NOS) in patients with OSA and controls, and to identify candidate genes which may be used in a genetic screen.

Methods: This is a prospective study comparing the presence of the candidate genetic markers between 25 patients with OSA proven on polysomnogram (PSG) (AHI >5) and 10 controls with normal PSG. DNA from blood was extracted using the Qiagen protocol and tested for the presence of the following genomic factors: TNF-alpha, fibrillin, NOS, endothelin 1 and CTGF by polymerase chain reaction (PCR) using specific markers.

Results: In the study group, 2 specimens were positive for TNF-alpha, 3 positive for fibrillin, 1 positive for NOS, and 3 positive for CTGF. Among the controls, 1 was positive for CTGF.

Conclusion: TNF-alpha is associated with obesity, fibrillin and CTGF with abnormal tissue laxity and NOS with impaired neuromuscular control, all of which have been implicated in the causation of OSA. Although the incidence of mutations in the genes studied has been noted to be higher in the OSA patients compared to the control group, the difference lacks statistical power due to the small sample size. However, based on preliminary results, fibrillin and TNF-alpha seem to be promising genetic markers for OSA.

Combined Palatopharyngeal and Uvulopalatal Flap: A New Surgical Technique for Velopharyngeal and Lateral Pharyngeal Wall Collapse in Obstructive Sleep Apnoea

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Aim: A prospective study to evaluate an innovative surgical technique addressing velopharyngeal and lateral pharyngeal wall collapse, which play an important role in the pathogenesis of obstructive sleep apnoea (OSA).

Methods: Sixteen consecutive patients with OSA with retropalatal obstruction presenting between May 2004 and May 2005 were selected. They underwent bilateral tonsillectomy, release of the palatopharyngeus muscle and advancement of the superior-lateral flap anteriorly, superiorly and laterally to the superior-lateral corner soft palate, so as to increase both the lateral and anteroposterior dimension as well as increase tension of lateral pharyngeal wall (to treat airway collapse). In addition, a modified uvulopalatal flap was performed to prevent retropalatal collapse. Computed-assisted quantitative videoscopic upper airway analysis was used to assess increase diameter and collapsibility of the upper airway.

Results: Sixteen patients were included in the study. Computed-assisted quantitative videoscopic examination was performed, pre- and postoperatively with patient supine and during Muller manoeuvre, to objectively measure improvement in transverse, longitudinal diameter, area at velopharynx as well as collapsibility. With this new surgical technique, there is remarkable increase in area at velopharynx, transverse dimension and lateral dimension of 109.0%, 96.8% and 44.0% respectively. There is significant decrease in the collapsibility of retropalatal area, transverse dimension, and lateral dimension of 32.9%, 49.8% and 288.9% respectively.

Conclusion: This new technique not only addresses the pathophysiology of retro-palatal collapse in OSA, it is more physiological, and results in less pain and dysphagia with earlier postoperative recovery compared to traditional UP3.

A Prospective Trial using Electroacupuncture for Refractory Acute Emesis due to Doxorubicin-containing Chemotherapy

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Aim: To evaluate the efficacy of acupuncture in preventing anthracycline-based chemotherapy-related nausea and emesis refractory to combination $5HT_3$-antagonist and dexamethasone.

Methods: Cancer patients with refractory emesis after their first cycle of doxorubicin-based chemotherapy were accrued into this study. Electroacupuncture was given during the second cycle of chemotherapy. Each patient was evaluated for the number of emetic episodes and grade of nausea within the first 24 hours after chemotherapy and acupuncture.

Results: Forty-seven of a total of 317 patients screened were eligible for this study. Of these, 27 patients participated. Twenty-six (96.3%) of them had significant reduction in both nausea grade and episodes of vomiting after electroacupuncture. There was complete response with no emetic episodes in 37%. Subjectively, 25 (92.6%) out of the total 27 patients felt that acupuncture was an acceptable procedure and was helpful in reducing emesis. Acupuncture was well tolerated with a median pain score of 3 out of 10.

Conclusion: Electroacupuncture is well tolerated and effective as an adjunct in reducing chemotherapy-related nausea and emesis.

A Study of Genomic Aberrations in Gastric Adenocarcinoma using Microarray Comparative Genomic Hybridisation

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Aim: To study the sequence of changes in the genomic signature of gastric mucosa as it transits from normal to adenocarcinoma. This would be the first step towards identifying key genes involved in the initiation of carcinogenesis in gastric mucosa.

Methods: Samples were taken from archived paraffin blocks of 17 patients who had undergone gastrectomy in the last 5 years. Each patient had samples taken of mucosa showing one of the following: tumour, dysplasia, intestinal metaplasia or adjacent normal. There were a total of 58 specimens sampled. Sampling was performed using a novel technique to acquire sufficient DNA such that array CGH could be performed without first undergoing a separate amplification process.

Results: Our preliminary results show that histologically normal adjacent gastric mucosa in patients with gastric cancer may harbour significant genomic aberrations as well. These changes include copy number changes that have been documented in gastric adenocarcinoma, such as 18 q losses and gains in chromosome 7 and 8.

Conclusion: Gastric carcinogenesis may be initiated earlier than was previously thought with detectable losses and gains in the genomic signature of histologically normal adjacent gastric mucosa from patients with proven gastric cancer.

Sudden Unexpected Cardiac Deaths in Singapore

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Aim: Sudden unexpected deaths in young people are rare. We conducted a retrospective analysis of all sudden unexpected cardiac deaths (SCD) for the year 2003 in Singapore to identify its causes and demographic characteristics.

Methods: Consecutive patients, aged 18 to 60 years, seen alive within 24 hours of death, on whom autopsy found a cardiac cause of death were included.

Results: Out of 229 autopsies performed for sudden death, 96% (n = 220) was classified as SCD. Ninety-one per cent were males. The mean age for males and females was 46 ± 9 years and 49 ± 9 years respectively. The racial distribution was as follows: 53.2% Chinese, 16.4% Malay, 14.0% Indians and 16.4% of other racial group. Of these deaths, 81% (n = 178) were due to ischaemic heart disease (IHD), 14% due to myocardial diseases, 2% due to valvular heart diseases and 3% due to microvascular disease of the heart. The IHD group was predominantly male (92%). The extent of coronary artery disease was triple vessel in 52%, double vessel in 25% and single vessel in 20%. Forty per cent (n = 64) of the IHD group was ≤45 years old, of which triple vessel CAD accounted for 50%. The myocardial disease group (n = 31) comprised hypertensive heart disease (HHD) (16), hypertrophic cardiomyopathy (HCM) (2) and myocarditis (13). The mean left ventricular wall thickness for HHD and HCM were 17 ± 2 mm and 21 ± 3 mm respectively. The group with microvascular disease of the heart (n = 6) may have died of primary arrhythmias.

Conclusion: CAD remains the leading cause of SCD in male patients

between 18 and 60 years old. Irrespective of age (≤45 or >45 years), almost half of the patients who died of IHD already had triple vessel disease.

Septal Mitral Annular Early Velocity Predicts Heart Iron Overload in Beta Thalassaemia Major

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Aim: Myocardial tissue magnetic resonance (MR) relaxation parameter T2* is inversely related to heart iron concentration, and is useful in diagnosis of transfusion-induced siderotic cardiomyopathy in thalassaemia major (TM). In this pilot study, we compare echocardiographic and MR findings in TM patients.

Methods: Ten local beta-TM patients underwent heart MR T2* scans as part of an NIH-funded trial (No.1 RO1 DK066084-01), as well as full echocardiographic studies (including tissue Doppler imaging) within 4 weeks. Echocardiographic systolic and diastolic functional measurements correlated with myocardial MR T2* measurements.

Results: Demographics: M:F = 4:6; age range, 18 to 30 years (mean, 21.5 years); transfusion frequency, 3 to 6 weeks (mode 4). All received chelation therapy: 5 desferrioxamine; 1 deferiprone; 4 combined. Patients were classified into myocardial overload (Group 1, T2* ≤20 ms, n = 6) versus no myocardial iron overload (Group 2, T2* >20 ms, n = 4). Between groups 1 and 2, there were no statistically significant differences in left ventricular ejection fractions, atrial volumes and ejection fractions, mitral early velocities and deceleration times, and velocities of mitral colour propagation. However, there was a significant difference in the septal myocardial early velocities (septal E') measured using tissue Doppler imaging: mean 10.7 cm/s (95% CI, 0.8 cm/s) versus 14.87 cm/s (95% CI, 2.3 cm/s) in groups 1 and 2 respectively, $P = 0.03$. Linear regression analysis reveals good correlation between septal E' (y) and myocardial T2* (x); regression equation: $y = 9.90 + 0.12x$ ($R^2 = 0.71$, $P = 0.002$).

Conclusion: Mitral annular septal E' velocities correlate positively with myocardial T2* values, and may potentially be used in predicting myocardial iron overload in transfusion-dependent TM patients.

Borderline Viability: Survival and Neonatal Morbidity on GA <27 weeks

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Aim: To assess predictors of survival and evaluate pre-discharge outcome in extremely preterm infants <27 weeks between 1997 and 2004.

Methods: Cohort study of liveborn infants <27 weeks gestation. Logistic regression models were used to identify maternal and neonatal factors associated with survival/severe morbidity.

Results: During the 8-year period, 376 infants <27 weeks were admitted. Overall survival to discharge was 70% (n = 261), with 38 (10%) labour-ward deaths. Significant linear relationship seen between gestational age and survival with survival improving 0% at 22 weeks, 28% at 23 weeks, 59% at 24 weeks, 77% at 25 weeks and 88% at 26 weeks. On logistic regression analyses, higher survival was associated independently with increasing birthweight (0.0001), antenatal steroids (0.039), absence of airleaks (0.012), and necrotising enterocolitis (NEC) (0.005). Among the 231 survivors, major neonatal morbidities with long-term implications were severe intraventricular haemorrhage (IVH), 36 (14%); periventricular leukomalacia (PVL), 9 (3.5%); chronic lung disease at 36 weeks, 102 (39%); severe retinopathy of prematurity (ROP), 68 (26%); and NEC, 15(6%). An unfavourable outcome comprising any major morbidity was seen in 138 (53%) survivors and decreased with increasing gestational age (P <0.001; OR 0.45; 95% CI, 0.33 to 0.62). A composite outcome of severe morbidity or death was seen in 95% babies at 23 weeks and decreased to 82% at 24 weeks, 73% at 25 weeks and 43% at 26 weeks (P <0.01).

Conclusion: Improved survival at borderline viability was associated with antenatal steroids, increasing gestational age and birthweight, and the absence of NEC and airleaks. Reduction in major neonatal morbidities was also seen with increasing gestation. Current data are useful in providing guidelines for perinatal care decisions and parental counseling.

A Prospective Review Comparing Patient-controlled Epidural Analgesia with Continuous Epidural Infusion for the Maintenance of Labour Epidural Analgesia in the Delivery Suite

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Aim: To compare the quality of analgesia and side effects rendered by patient-controlled epidural analgesia (PCEA) and continuous epidural infusion (CEI) for intrapartum epidural analgesia.

Methods: Over a 2-month period, we collected and reviewed the data of 98 consecutive nulliparous parturients who requested for labour epidural analgesia. All parturients received a combined spinal epidural analgesia with an induction dose of intrathecal ropivacaine 2.5 mg and fentanyl 15 mcg. For maintenance of analgesia, Group CEI received a continuous epidural infusion of ropivacaine 0.125% with fentanyl 2 mcg/mL at the rate of 10 mL/h. Group PCEA received a PCEA with basal infusion rate of 5 mL/h, demand bolus 5 mL, lockout time 12 min and an hourly limit of 20 mL/h of similar epidural solution. We recorded their pain scores, the number of rescue epidural boluses required, post-block side effects, obstetric outcome and overall maternal satisfaction with the analgesia. The data were analysed using SPSS version 9.0.

Results: Of the 98 cases reviewed, 78.6% received a CEI while 21.4% received a PCEA. Both groups had similar demographic profile. Group CEI had an increased incidence of breakthrough pain when compared with Group PCEA (45% versus 5%, P <0.05). The mean number of epidural rescue needed per patient was also higher in Group CEI than in Group PCEA [0.49 ± (SD) 0.8 versus 0.05 ± 0.2, P <0.001] Parturients who received PCEA showed an improved satisfaction score.

Conclusion: Our review revealed that the use of PCEA for the maintenance of labour analgesia decreased the incidence of breakthrough pain, decreased the requirement for rescue epidural analgesia and increased overall maternal satisfaction when compared with the conventional CEI technique.

A New Cumulative Embryo Scoring System for the Prediction of Pregnancy Outcome following Intracytoplasmic Sperm Injection

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Aim: To evaluate the use of a new cumulative embryo scoring system (CES) in comparison with age and infertility diagnosis for the prediction of pregnancy outcome.

Methods: A retrospective cohort study was conducted on 364 consecutive triple embryo transfers performed between January 2002 and January 2004. Embryo quality was assessed using a 5-point scoring system based on cell number, symmetry and fragmentation. The CES was the summation of the individual scores. For the purpose of analysis, these in turn were categorised into 3 groups: CES group 1 (score, 9 to 10), CES group 2 (score, 11 to 13) and CES group 3 (score, 14 to 15). Outcome measures analysed were clinical pregnancy, as defined by the presence of gestational sacs at 6 weeks on ultrasound scan, implantation, livebirth and multiple birth rates.

Results: There was a trend towards better outcome with increasing CES scores. When CES was analysed according to groups, this trend was significant by chi-square and Fisher's exact tests (P <0.05). CES groups 1, 2 and 3 corresponded with increasing pregnancy rates (30.3%, 45.1% and 51.7% respectively), implantation rates (12.4%, 20.5% and 21.8% respectively), and livebirth rates (12.4%, 26.4% and 31.0% respectively). Multivariate binary logistic regression showed that age was also a significant independent predictor of clinical pregnancy but infertility diagnosis was not. However, only CES group score was significant in predicting livebirths while age was significant in predicting multiple births.

Conclusion: CES is useful for the prediction of pregnancy outcome. In younger patients with good CES, a policy of transferring fewer embryos to reduce multiple pregnancies should be adopted.

A Study of Dengue Fever in the Paediatric Population: Is there a Safe Platelet Criteria for Discharge? (January 2003 to May 2004)

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Aim: This study aims primarily to determine safe discharge criteria in paediatric dengue.

Methods: This was a retrospective analysis of paediatric admissions with discharge diagnoses of dengue or mosquito-borne haemorrhagic fever from January 2004 to May 2004. Thirty-one primary (PD) and 30 secondary (SD) dengue cases were analysed.

Results: There were 283 dengue cases admitted (62% PD, 26% SD and 12% presumed). Haematological factors associated with SD are a lower admitting platelet count (PC) (P = 0.005); lower and earlier platelet nadir (P = 0.005) and haemoconcentration. Complications in both groups occurred 1 day after the platelet nadir at a mean PC of 75 x 10^9/L in PD and 61 x 10^9/L in SD. Receiver operating characteristic curve showed no critical platelet level for complications (PD: P = 0.980; SD: P = 0.325). All cases showed recovery of PC >100 x 10^9/L by day 7 and >120 x 10^9/L by day 8 and were discharged without sequelae. More than 97% of our discharges met all WHO discharge criteria.

Conclusion: SD carries a higher risk of complications and is associated with an earlier presentation, a lower admitting PC, a lower and earlier platelet nadir and haemoconcentration. Complications usually occurred 1 day after the platelet nadir and did not correlate with the degree of thrombocytopaenia. Discharge for paediatric dengue is safest after day 7 of illness, beyond 24 h of the platelet nadir, when the PC is ≥80 x 10^9/L and showing a convincing rise (PD >60%; SD >120%), and clinical recovery evident.

Effect of Chelating Agents on Smear Layer Removal with and without Ultrasonics

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Aim: To evaluate in vitro the effectiveness of chelating agents on smear layer removal with and without the use of ultrasonics.

Methods: One hundred and five extracted teeth were randomly divided into 7 groups. They were mechanically instrumented to apical file size 40 with a combination of rotary and hand instrumentation. RC-Prep and 1% sodium hypochlorite (NaOCl) were used during instrumentation in all except one group, where only saline was used. All 7 groups had different final irrigating protocols involving the use of saline, NaOCl, EDTA and ultrasonics in various combinations. The specimens were vertically grooved, split and prepared for SEM examination. Specimens were evaluated at the apical (2 mm) and mid-root (6 mm) levels at 1000x and 3000x magnification. Smear layer and debris removal were scored by 2 examiners. Results were subjected to statistical analysis using chi-square/Fisher's exact test.

Results: At the 2-mm level, specimens from groups with EDTA and ultrasonic irrigation had significantly more specimens with smear layer and complete debris removal. At the 6-mm level, regardless of the use of ultrasonics, the groups with EDTA irrigation had more specimens with smear layer removed. However, only specimens with EDTA and ultrasonic irrigation had a significantly higher number of specimens with complete debris removal at the 6-mm level.

Conclusion: The combined use of EDTA and ultrasonics is more efficacious for smear layer and debris removal especially in the apical region. A 1-minute application of ultrasonics in the final irrigation sequence appeared to be sufficient for this purpose.

A Prospective Study on Wound Healing after Extractions in Irradiated Jaws

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Aim: To determine the incidence of delayed healing (DH) and osteoradionecrosis (ORN) after extractions in our patients with irradiated jaws and its correlation with patient-related, tooth-related and radiation therapy-related risk factors.

Methods: This is a prospective study involving 72 patients and a total of 319 teeth extracted. Patient-related factors include gender, age, ethnicity, smoking habit and alcohol consumption. Tooth-related characteristics charted were location, pulpal status and periodontal status. Radiation therapy-related characteristics collected include maximum mouth opening, location of cancer, total radiation dose (TRD), time period from radiation therapy to tooth extraction, and the localised radiation absorption (LRA) for the tooth extracted.

Results: 7.5% and 0.9% of extractions developed DH and ORN respectively. The localised radiation absorption (LRA) calculated for

the teeth (mean, 19.39 Gy) were much lower than the total radiation dose (TRD) (mean, 38.86 Gy). The two factors that were significant in influencing wound healing were the LRA (P = 0.0073) and TRD (P = 0.014). Teeth with LRA >59 Gy were at a significantly higher risk of developing DH and ORN than teeth with LRA of 0 to 9 Gy (P = 0.0042). Teeth with TRD >50 Gy was also at a significantly higher risk of developing DH and ORN than teeth with TRD ≤50 Gy (P = 0.017). Within the DH and ORN groups, the maxillary teeth (53.5 Gy) were exposed to significantly higher LRA than the mandibular teeth (23.1 Gy) (P = 0.0093).

Conclusion: The incidence of DH and ORN following tooth extractions in patients with irradiated jaws is low. Individualised risk assessment is best established by calculation of LRA for the tooth planned for extraction. Teeth with increased risk should be treated conservatively or extracted under hyperbaric oxygen (HBO) cover.

Deep Lamellar Keratoplasty (DLKP) With and Without Baring of the Descemet's Membrane(DM) – A Comparative Study

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Aim: Deep lamellar keratoplasty (DLKP) is a recent corneal transplantation technique for corneal stromal disorders which allows total or subtotal removal of the recipient corneal stroma whilst retaining the recipient Descemet's membrane (DM) and endothelium, and has major advantages in terms of the reduction of allograft rejection and non-entry into the anterior chamber of the eye. We describe the visual outcomes of DLKP in our series with baring of the DM (Group I) and without baring of the DM (Group II).

Methods: We performed DLKP in 35 eyes (34 patients), 20 eyes with a modified Anwar technique with dissection up to the DM and 15 eyes manual DLK without baring of the DM.

Results: Preoperative VA ranged from count fingers (CF) of 6/18 in both groups. The commonest indications for surgery were corneal scar followed by keratoconus in both groups. The average follow-up was 5.6 months in group I and 22.8 months in group II. Best-corrected visual acuity (BCVA) of 6/6 was achieved in 45% of the group I compared to just 7% of Group II. BCVA of 6/24 or better was seen in 85% in group I vs 73% in the second group. Complications included 2 intraoperative perforations in group I and 1 regraft in group II. Additional surgeries in the patients included resuturing of the graft, air injection and amniotic membrane transplant.

Conclusion: DALK with dissection up to the DM gives significantly better visual acuity outcomes in patients due to the absence of an additional posterior stromal interface and is the preferred method for lamellar corneal surgery.

A Prospective Randomised Controlled Trial Comparing Bipolar Transurethral Resection in Saline (TURis) System and Conventional Monopolar Transurethral Resection of Prostate in Men with Benign Prostate Hyperplasia: A Year's Clinical Efficacy and Safety

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Aim: To perform a prospective randomised controlled trial comparing the clinical efficacy and safety of bipolar transurethral resection in saline (TURis) system and conventional monopolar transurethral resection of prostate (TURP) in the treatment of men with benign prostate hyperplasia.

Methods: Prospective information about patients who underwent TURP was collected. Baseline data such as serum prostatic specific antigen, uroflow and residual urine (RU), International Prostate Symptoms Score (IPSS) and quality of life (QOL) score were documented. They were randomised to either arm and were blinded to the treatment modality. Their repeat serum haemoglobin and sodium were determined after the completion of TURP. The patients' uroflow, RU, IPSS and QOL were determined 1, 3, 6 and 12 months after discharge and any complications were documented.

Results: There are 48 patients in the TURis group and 52 patients in the conventional TURP group. They had similar baseline characteristics. There were significant postoperative improvements in both groups with no statistical difference between them. The decline in mean postoperative serum sodium was greater in the TURP group, with 3 cases of transurethral resection (TUR) syndrome and none in the TURis group. However, there were more cases of stricture seen in the TURis group (3 versus 1).

Conclusion: The use of TURis for TURP produced clinical efficacy similar to that of conventional TURP at 1 year. There was a smaller decrease in postoperative serum sodium level and significantly lower incidence of TUR syndrome in the TURis arm.

A Clinicopathological Study of Epstein-Barr Virus-positive (EBV+) Smooth Muscle Tumours (SMT) in Adult Renal Transplant Recipients

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Aim: To determine the clinicopathological characteristics of Epstein-Barr virus-positive (EBV+) smooth muscle tumours (SMT) in adult renal allograft recipients.

Methods: From the SGH renal transplant registry from 1989 to 2004, there were 8 EBV+ SMT cases. Immunohistochemistry (IHC) and in-situ hybridisation (ISH) for SMT and EBV were done. Methylation studies on various tumour suppressor genes were also performed.

Results: The total number of renal transplant patients in this period was 667, with 88 patients diagnosed with cancer. EBV+ SMT was higher in incidence (7.4%) than post-transplant lymphoproliferative disease (5.6%). All were Chinese, with a mean age of 42 years. Mean time to diagnosis from renal transplant was 6 years. All but one are alive, with a mean survival of 41 months, with no deaths being EBV+ SMT-related. The EBV+ SMT were indolent in behaviour and tapering of immunosuppression for all patients yielded no objective responses. One patient with biopsy-proven multiple EBV+ SMT liver nodules that progressed on immunosuppression taper was treated with rapamycin with durable complete radiological regression. The morphological features of all 8 patient tumour specimens show smooth muscle differentiation. EBV-encoded RNA (EBER) and antigen (EBNA-2) were positive in all patients. By IHC, smooth muscle actin (SMA) was strongly positive in all patients and desmin-positive in 6 patients. Polymerase chain reaction (PCR) results show aberrant methylation for tumour suppressor genes, RASSF1A, p16 and DAP-kinase.

Conclusion: We present what is arguably the largest reported single series. The high incidence of EBV+ SMT in Chinese immunosuppressed patients suggests there may be an ethnic/geographical predisposition. Rapamycin may be a novel therapeutic agent for EBV+ SMT.

Results from a Randomised Trial on Early Stress Nuclear Scan for Patients Presenting to the Emergency Department with Chest Pain but Non-diagnostic Electrocardiography

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Aim: To compare the incidence of adverse cardiac events (ACE) among patients discharged after evaluation through short-stay chest pain evaluation protocol with mandatory stress nuclear scan and conventional protocol.

Methods: A randomised controlled trial was conducted, involving patients presenting to the Emergency Department (ED) with chest pain or symptoms suggestive of angina with a 12-lead ECG non-diagnostic for myocardial ischaemia or infarction (AMI). Intervention ECG and blood test for CKMB and troponin T were done at 0, 3, and 6 hours. Patients in the study group who had a negative 6-hour evaluation underwent tetrofosmin scan within 24 hours, and those with positive result were admitted. In the control group, patients with high or moderate risk for coronary artery disease (CAD) were admitted. All patients were followed up at 1 year for ACE such as cardiac death, ventricular fibrillation, AMI, cardiogenic shock, or coronary revascularisation (CR) procedures.

Results: One thousand and five patients were randomised to mandatory nuclear scan and 504 patients to the control group. There was no significant difference in the rate of ACE or CR between the study group (5.0%) and the control group (6.5%). There was a higher admission rate in the control group (17.5%) versus study group (10.1%).

Conclusion: Diagnostic strategies incorporating acute stress nuclear scan will lead to a reduction in hospital admissions for ED patients with chest pain. The 1-year ACE rate for patients with negative 6-hour evaluation is small. Further analysis needs to be done to identify those patients for whom mandatory stress nuclear scan is most cost-effective.

A Descriptive Epidemiological Review of the SGH VRE Van B Outbreak in March 2005

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Aim: To carry out a descriptive epidemiological review of the VRE Van B outbreak in Singapore General Hospital (SGH) in March 2005.

Methods: SGH mounted a vigorous battle against VRE Van B when an outbreak was detected in March 2005. 19,574 contacts were empirically ring-fenced, comprising inpatients from 1 December 2004 to 2 April 2005 (the first day when segregation of contacts from clean inpatients occurred). Improved laboratory methodology for case detection with active surveillance was applied to inpatient contacts. Cross-sectional data on the sample of inpatients on 2 April were analysed. Odds ratio for high-risk groups and attack rates were calculated.

Result: Four infected cases, 147 carriers and 5543 primary were identified. Molecular typing revealed 5 grouped patterns of VRE Van B strains. An outbreak clone accounted for 77% (108 of 140) of carriers typed. High-risk factors included C class status [67% of carriers (OR 3.57; CI 95% 2.38, 5.38)], readmissions as inpatients (66.7% OR; 1.64 CI 95% 1.12, 2.40) and ESRF [40.7% (OR 1.42; CI 95% 0.93, 2.18)]. Two factors triggering the outbreak were the presence of an outbreak clone and a conducive C class environment. Intensive infection control measures with segregation of contacts from clean, isolation of cases, curtailed the outbreak. First-generation attack rate of 2.2% (overall mean, 4.4%) was noted with remnant endemicity of 2.7% among screened contacts.

Conclusion: An efficiently transmissible strain of VRE within a C class communal setting contributed significantly to the outbreak and this warrants vigilance, active surveillance and intense infection control to keep endemicity in check.

Changes in Cerebral Oxygenation with Cerebrovascular Pressure Reactivity in Severe Traumatic Brain Injury

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Aim: To study how a cerebrovascular pressure reactivity index, PRx, is related to brain tissue oxygenation ($PtiO_2$) following head injury, and to determine PRx and $PtiO_2$ trends with time and whether this may be related to mortality.

Methods: Forty patients with severe head injuries were prospectively recruited. $PtiO_2$ and intracranial pressure (ICP) were monitored using special probes. Time-averaged values of ICP, arterial blood pressure (ABP), cerebral perfusion pressure (CPP) and $PtiO_2$ were obtained. PRx was calculated as a moving correlation coefficient between 40 consecutive samples of ICP and ABP averaged for a period of 5 seconds. The mean values of the variables were obtained at the 6-hour and 72-hour post-injury time points and the difference between the 2 time points for each of the variables were denoted as delta (δ) values.

Results: The study cohort contained 31 survivors and 9 non-survivors. Statistically significant differences were present between these 2 groups with regard to MAP72h (P <0.05), δMAP (P <0.005), ICP6h (P <0.05), CPP72h (P <0.05), δCPP (P <0.005) PRx72h (P <0.05), δPRx (P <0.05), $PtiO_2$72h (P <0.05) and $\delta PtiO_2$ (P <0.05) values, reflecting an improvement with time in survivors and a deterioration with time in non-survivors. In non-survivors, the magnitude of change in $PtiO_2$ and CPP with time correlated in a negative linear fashion (P <0.05) with the change in PRx, whereas no such relationship was demonstrated in survivors.

Conclusion: We demonstrate that PRx, which approximates the state of cerebral autoregulation, correlates with brain tissue oxygenation and is also related to outcome. This study supports the utility of PRx as a bedside monitoring modality and also the concept of a target-driven approach to head injury management.

A Recombinant DNA Vaccination Strategy to Improve Neurological Outcome in an Animal Model of Ischaemic Stroke

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Aim: To ascertain the efficacy of a recombinant vaccine encoding for prominent neurite growth inhibitors (NGI): myelin-associated glycoprotein (MAG), Nogo-A and tenascin-R, in the induction of neuroplasticity to facilitate neurological recovery.

Methods: To generate the recombinant plasmid (pcDNA-NGI), the domains of MAG, Nogo-A and tenascin-R demonstrated to have axon-growth inhibitory properties were subcloned and inserted sequentially into a pcDNA3.1+ vector. Vaccination with the recombinant plasmid has previously been shown not to cause autoimmune demyelination. The left middle cerebral artery occlusion (MCAO) stroke model was utilised. Animals were immunised using a uniform protocol which included controls (vaccination with pcDNA-NGI before and after MCAO; vaccination with empty vector pcDNA3.1+; sham MCAO and intact animals) and the in vivo production of antibodies was assayed. Established behavioural assessment regimens (modified composite neurological score, elevated body swing test, cylinder exploration test) to evaluate neuromotor behaviour was carried out in addition to morphometric analysis of newly generated corticorubral axons by means of anterograde tract-tracing with biotinylated dextran amine stereotactically injected into the contralateral motor cortex.

Results: All infarcts involved the sensorimotor cortex and volumes did not show significant differences between treatment and control groups. A robust antibody response was demonstrated in animals vaccinated with pcDNA-NGI and these animals showed significantly larger numbers of contralateral corticorubral axons projecting across the midline and terminating in the ipsilateral red nucleus after MCAO. In addition, these animals showed significant motor recovery compared to controls.

Conclusion: The strategy of DNA vaccination against neurite growth inhibitors may be useful in attenuating neurological deficits and promoting recovery after ischaemic stroke.

Medicine and Paediatrics Oral Papers
Best NHG Oral Paper Award Finalists

The Association of HLA Class II Antigens with Achalasia in Chinese Patients

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Aim: We aimed to determine if HLA-DRB1 polymorphism was associated with susceptibility to achalasia.

Methods: We prospectively studied 47 Chinese patients who had been diagnosed with achalasia on the basis of compatible symptoms, endoscopic, radiologic and manometric features. A total of 116 unrelated healthy individuals of the same ethnic origin were recruited as controls. Genomic DNA was extracted from peripheral leukocytes using a standard salting-out procedure. Polymorphic sequences of the HLA-DRB1 gene were amplified using polymerase chain reaction. The amplicons were then subjected to cleavage by various specific restriction endonucleases, following which, the cleaved products were electrophoresed through ethidium bromide stained agarose gel to determine the presence or absence of HLA-DRB1 alleles (HLA-DR1 to HLA-DR10). The frequencies of the various alleles were compared between patients and controls.

Results: In healthy controls, the distribution frequencies of various HLA-DRB1 alleles were 0.00, 0.19, 0.07, 0.13, 0.29, 0.13, 0.02, 0.06, 0.10, and 0.01 for DR1, DR2, DR3, DR4, DR5, DR6, DR7, DR8, DR9, and DR10, respectively. In achalasia patients, the frequencies of the same alleles were 0.00, 0.19, 0.02, 0.11, 0.29, 0.14, 0.00, 0.04, 0.20 and 0.01, respectively. While there was no difference in the frequency of distribution of 9 of the 10 DR alleles, the frequency of the DR9 allele was higher in the achalasia patients (20.2%) than controls (10.3%; $P = 0.017$). The allele was positively associated with achalasia, with a risk ratio of 1.95 (95% CI, 1.1249 to 3.3938).

Conclusion: There is a positive association of the HLA-DR9 allele with achalasia.

Adiponectin Gene Polymorphism and Type 2 Diabetes in Chinese

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Aim: Adiponectin, the most abundant circulating adipokines in human, powerfully modulates insulin actions. Genetic polymorphisms of adiponectin have been reported to be associated with type 2 diabetes (T2DM) in Caucasian and Japanese. We hypothesised that a common synonymous single nucleotide polymorphism (SNP) at +45T>G is associated with T2DM in Chinese.

Methods: In a case control study, we investigated the relationship between this SNP and T2DM in 602 Chinese adults. Genotype was determined using TaqMan RT-PCR assay.

Results: The controls (N = 288) were: 27% male, age (SD) 38 (12) year, BMI 22.8 (3.8) kg/m^2, systolic BP (SBP) 120 (18) mmHg, diastolic BP (DBP) 76 (11) mmHg, fasting plasma glucose 5.1 (0.5) mM. The cases (N = 314) were: 58% male, age 64(10), duration of diabetes 16 (8) years, BMI 25.5 (3.6), SBP 139 (17), DBP 79 (9), HBA1c 7.8 (1.4)%. The distribution of GG, GT and TT genotype among controls (6.6%, 44.8% and 48.6% respectively) was consistent with Hardy-Weinberg equilibrium ($P > 0.05$) and did not differ significantly from the genotype distribution among cases (11.5%, 41.4% and 47.1% respectively) (chi-square = 4.37, df = 2, $P = 0.11$). Distribution of the alleles among controls (G 29%, T 71%) and cases (G 32%, T 68%) were also similar (chi-square = 0.64, $P = 0.43$). However, assuming a recessive genetic model, the distribution of homozygous GG genotype among cases (GG 11.5%, GT + TT 88.5%) was higher than that among controls (GG 6.6%, GT + TT 93.4%) (chi-square = 4.29, $P = 0.038$); relative risk (odds ratio) conferred by GG genotype = 1.89 (95% CI, 1.09 to 3.30, $P = 0.024$).

Conclusion: We conclude that homozygous GG genotype at adiponectin gene +45T>G is associated with T2DM in Chinese.

Effects of Antipsychotics on Metabolism

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Aim: This prospective and naturalistic study aims to examine the effects of antipsychotic medication on patients' body mass index (BMI), lipids, glucose and insulin levels.

Methods: One hundred and fifty-two patients with first-episode psychosis, who had been started on antipsychotic medication, were invited to participate. Patients who were on other medications with known effects on the above metabolic parameters were excluded. Measurements were taken at baseline (prior to treatment), 3 months and 6 months.

Results: Pre-post comparisons showed that there were significant increments in BMI (1.71, SE = 0.23, $P < 0.001$), body fat percentage (2.24%, SE = 0.42, $P < 0.001$), total cholesterol (0.49 mmol/L, SE = 0.10, $P < 0.001$), low-density lipoprotein (LDL) cholesterol (0.33mmol/L, SE = 0.09, $P < 0.001$),) and triglycerides (median = 0.16mmol/L, $P < 0.001$) at 3 months. At 6 months, there were further increments in BMI (median = 1.97, $P < 0.001$), body fat (3.65%, SE = 0.52, $P < 0.001$), total cholesterol (median = 0.58 mmol/L, $P < 0.001$), LDL cholesterol (0.41 mmol/L, SE = 0.09, $P < 0.001$), and triglycerides (median = 0.16 mmol/L, $P = 0.003$). There were no significant changes in fasting blood glucose and insulin levels at 3 and 6 months. Analysis of covariance using age, baseline BMI, gender, race, and type of antipsychotics showed the following: age had a negative effect on the percentage change of BMI (-0.973%, $P = 0.008$) at 6 months; baseline BMI and age had negative effects on the percentage change of body fat (-1.806%, $P = 0.039$ and -1.388%, $P = 0.004$ respectively) at 6 months. Males had a significantly higher percentage change of LDL cholesterol (19.78%, $P = 0.021$). The type of antipsychotic medications (atypical or typical) did not significantly differ in their influences on metabolism.

Conclusion: Antipsychotics appear to induce detrimental changes in BMI, body fat percentage and lipid profile.

Characteristics of Elderly Patients Admitted to Changi General Hospital with a History of Falls

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Aim: To identify and characterise elderly people admitted with a history of falls to develop a service to ensure their opportune assessment.

Methods: A descriptive study of all patients above the age of 70 years admitted to acute medical and surgical wards between May 2004 and June 2004 were screened. Patients were identified prospectively by nurses on the wards and through an identification label attached to an audit sheet. Case notes were reviewed on discharge. Information on gender, age, principal diagnosis, history and location of falls, and mobility status were collected.

Results: Twenty-five per cent of elderly admissions had a history of falls. Among them, 61.5% were between 75 and 85 years of age and 22.9%, were more than 86 years of age. The ratio of males to females was 2:3. The main admitting specialties were Geriatrics (40%), Orthopaedics (32.9%), and Medicine (24%). The main diagnoses on admissions were falls and fractures (40%), infections (30%), and cardiovascular events (10%). Prior to admission, 75% of them had been walking and 42.9% were community ambulant. Ninety per cent lived in their own homes whilst 10% were from nursing or sheltered homes. Thirty-two per cent patients had recurrent falls. Fifty per cent had a history of injury, the most common being fractures (28%) and soft tissues (15%). A trip/slip was reported in 32% of cases whilst dizziness was reported in 8%. Polypharmacy contributed to fall risk in 32%, followed by cognitive impairment in 52% of cases. A high percentage of patients were not assessed for fall risk factors.

Conclusion: This study showed that elderly patients with a fall or fall history did not receive comprehensive fall risk assessment. Thus the management of their falls and prevention of further falls are not being assessed.

A Prospective Study to Identify the Prevalence and Contributing Factors of Constipation and Faecal Impaction in the Elderly

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Aim: To determine the prevalence of constipation and faecal impaction of patients aged 65 years and above in an inpatient geriatric unit, and to ascertain the contributing factors to the above conditions. If found significant in the local context, an assessment tool with suggestive algorithms for nursing interventions could be implemented.

Methods: The study population of 300 inpatients admitted to geriatric wards. Questionnaires were used to collect data on demographics, bowel patterns, rectal examinations, results of abdominal radiological investigations and possible factors contributing to constipation.

Results: Subjects' age ranged from 72 to 95 years. Of the 300 patients surveyed, 159 (53%) were constipated and 14 (8.8%) were on nasogastric tube feeding. In those eating orally, 90 (62%) were consuming fewer than 4 servings of vegetables/fruits and drinking less than 1.5 litres of water per day. Sixty-five (40.8%) were found to be ambulating with assistance. Amongst the constipated patients, 53 (33.3%) were on diapers, 12 (7.5%) were using commode and 76 (47.7 %) used toilet facilities. Abbreviated Mental Test scores of 71 patients (44.6%) were less than 7. The use of laxatives was evident in 87 (54.7%) patients. Similar data were gathered in patients with faecal impaction.

Conclusion: Prevalence of constipation and faecal impaction were evident in our elderly population. Some factors contributing to the conditions have been identified. We hope this study will enable us to focus on problem areas and ultimately improve the management of these patients.

Impact of a Structured Care Plan in the Management of Patients with Uncomplicated Acute Myocardial Infarction

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Aim: The purpose of the study was to evaluate the outcomes of patients on a revised inpatient acute myocardial infarction structured care plan.

Methods: This study was conducted in Changi General Hospital. A structured care plan for patients with acute myocardial infarction was revised based on evidence-based practices. The revised care plan was implemented on 21 February 2005. Patients put on this revised care plan were compared to patients prior to the revised care plan.

Results: The study included 79 patients in the pre-revision group versus 94 patients in the post-revision group. Data analysis on the revised care plan showed similar demographics for both groups of patients with regard to age ($\chi^2 = 0.622$), gender ($\chi^2 = 0.718$), and ethnicity ($\chi^2 = 0.611$). There was a significant reduction in the number of patients with non-ST elevation myocardial infarction (NSTEMI) who were transferred from the day ward to the general ward ($P < 0.05$), a reduction in time to thrombolysis from 47 minutes to 42 minutes ($P = 0.51$), a reduction in time to PTCA from 128 minutes to 123 minutes ($P = 0.876$), and a reduction in average length of stay from 4.68 days to 4.62 days ($P = 0.817$).

Conclusion: The study showed that significant improvements in the quality of patient care can be achieved by incorporating current practices in a structured care plan. This can lead to appropriate resource utilisation and an overall reduction in length of stay.

To Reduce Needlestick/Sharps Injuries Rates among Health Care Workers in the Operating Theatre by 50% in 6 Months

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Aim: To reduce needlestick/sharps injuries (NSI) rates among health care workers (HCWs) in the operating theatre (OT) by 50% in 6 months.

Methods: This is a Clinical Practice Improvement Programme Project involving various departments' clinicians and HCWs. Retrospective monthly data obtained from January 2004 to October 2004 showed that NSI rates were rather high in the OT, ranging from 0 to 2.1 per 1000 cases. The 2 major causes were unsafe practices and crossing of hands when handling sharps. Utilising the PDSA cycle, a cause and effect Fish Diagram of NSI in OT was done. Various OT preventive measures were implemented in stages from November 2004 to promote a safer work environment and inculcate safe practices. These were communicated through emails, during roll calls, in-services education and new staff, HO and MO orientations. Photographs on care of sharps and run charts were displayed on designated notice boards. Regular audits of compliance and discussion of results at OT Nursing Quality meetings were also conducted.

Results: The NSI rate did not decrease immediately during the month

of intervention in November. However, we began to see favourable results during the subsequent 7-month period (December 2004 to June 2005). There was a significant average reduction of 36% in NSI rate after intervention.

Conclusion: Although the 50% NSI rate reduction target was not achieved, we were encouraged by the 36% decrease over 7 months. This process should be ongoing to ensure compliance with safe practices and further improvement in the reduction in NSI rates.

Comparing Bacterial Contaminants of Expressed Breast Milk Stored at 4 Degrees Centigrade Beyond 24 Hours

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Aim: To test the bacteriological quality of expressed breast milk (EBM) on collection and refrigeration at 4°C for periods of 24 hours, 48 hours and 72 hours in a cohort of mothers with preterm infants admitted to the department of Neonatology, to evaluate the possibility of increasing refrigeration storage duration beyond 24 hours.

Method: This is a comparative descriptive study involving the collection of a one-time EBM sample from 35 lactating mothers using the hospital electric breast pump. The inclusion criteria for enrollment into the study are mothers who have delivered preterm infants weighing less than 1500 g admitted to the neonatal intensive care unit (NICU) or Special Care Nursery (SCN). Exclusion criteria for enrollment are mothers on antibiotics and those with conditions that are contraindications to breastfeeding. Each breast milk sample was divided into 4 aliquots and stored at 4°C and sent to the laboratory for culture commencing at 0 hours and then at intervals of 24 hours, 48 hours and 72 hours of storage. Bacterial colony forming unit per millilitre of milk (CFU/mL) were measured and compared at different storage times.

Results: Bacterial counts measured as CFU/mL declined as storage duration increased. Coagulase-negative staphylococcus (CoNs) was found to be present in all the EBM sampled.

Conclusion: This study has shown that with increased storage duration of EBM at refrigeration temperature of 4°C up to 72 hours, bacterial counts decline. The presence of CoNS found in all the EBM sampled in this study calls for re-examination in educating mothers on personal hygiene and handwashing technique during EBM collection as CoNS is a common skin commensal which often results in the contamination of EBM.

Falls Incidence and Fall Prevention Practices at General Hospitals in Singapore – A Retrospective Study

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Aim: To investigate the incidence of falls and explore fall prevention practices at general hospitals in Singapore.

Methods: A retrospective audit to collect baseline data on the incidence of falls (patient fall rates and fall injury rates) and fall prevention practices was conducted in 5 general hospitals in Singapore from December 2004 to March 2005. The study participants (n = 6000) were patients admitted into the medical, surgical, geriatric units from June 2003 to June 2004 in the 5 hospitals. The incidence of falls was obtained from the hospitals' fall databases and incident reports for the period of June 2003 to June 2004. A total of 6000 medical records from 5 hospitals were randomly selected, retrieved and reviewed to determine whether falls, fall assessments and interventions were being initiated and documented.

Results: The number of fallers for all the hospitals was 824 and the number of non-fallers was 5176. Analysis showed that patient fall rates ranged from 0.68 to 1.44 per 1000 patient days and the fall injury rates recorded in the 5 hospitals ranged from 24.4% to 71.7%. The use of a fall risk assessment tool by nurses, which was a policy in all the participating hospitals, was recorded in 76.9% of all the nursing records.

Conclusion: This present study has laid the foundation for further research for fall prevention in Singapore by describing our current fall incidences, fall injury rates and the status of fall prevention practices in our acute care settings. The next step would be to use the results of this study as a baseline for developing a tailored multifaceted strategy and evaluate its effectiveness for the implementation of Fall Prevention Clinical Practice Guidelines to impact nursing practice and reduce the burden of falls and fall-related injuries in hospitals in Singapore.

Home-based Programmes for Patients with Heart Failure

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Aim: To determine the effectiveness of home-based programmes, compared with usual care, on the readmission rate, mortality and quality of life in patients with heart failure.

Methods: The team searched Medline, Cochrane, CINAHL and reference lists of articles for studies published from 1995 to 2005. Two reviewers reviewed the articles independently. The search included randomised controlled trials which compared a usual care group with a home-based programme intervention group, patients above 55 years old with at least 1 admission with the diagnosis of heart failure, home-based intervention led by the nursing personnel and 6-month follow-up period upon discharge from the hospitals. Three studies met the inclusion criteria and were selected for the systematic review.

Results: In 2 studies, the readmission rate (P = 0.03; P = 0.03; P = 0.09) and length of stay (P = 0.05; P = 0.02; P = 0.09) in the intervention group were reduced significantly compared to those of the usual care group. The mortality rate at 6 months was lower in the home-based intervention group although it did not reach statistical significance. One study reported a significant improvement in the quality of life in patients with heart failure (P = 0.01).

Conclusion: Studies suggest that home-based programmes reduce the readmission rate and length of hospital stay significantly at 6 months. The mortality rate is lower in the home-based programme groups. However, larger-scale studies would be needed for better representation. Various tools were used to assess quality of life, making comparison difficult. Disease-specific tools may be helpful.

Alzheimer's Disease Cooperative Study Activities of Daily Living (ADCS-ADL) Scale: A Survey in Community-dwelling Elderly Singaporeans

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Aim: To survey the activities of daily living endorsed by community-dwelling elderly Singaporeans so as to ascertain if the items used in the Alzheimer's Disease Cooperative Study Activities of Daily Living (ADCS-ADL) scale are relevant for the assessment of dementia and mild cognitive impairment (MCI) in Singapore.

Methods: Questionnaires consisting of items from the ADCS-ADL scale were administered to 120 community-dwelling and cognitively intact subjects. Subjects aged 60 years and above were stratified for gender and ethnicity (Chinese, Malay and Indians). The questionnaire enquired about social, physical, cognitively demanding ADLs, such as the ability to perform personal self-care and instrumental ADLs (iADLs) (i.e., the utilisation of household appliances.)

Results: The questionnaire showed that younger individuals were more able on social and physical activities. Gender has an influence on the choice of hobbies performed. There was a linear relationship between the education level of subjects and their ability to perform iADLs. Ethnic variations were also noted on a number of hobbies and social activities. However, only 8 of the 32 hobby items were endorsed by more than 10% of the subjects surveyed. Subjects did not utilise some of the household items listed in the ADCS-ADL scale, though the type utilised was dependent on age, gender and educational level.

Conclusion: While the ADCS-ADL assessment tools provide a useful schema for assessing the elderly, several items should be modified to reflect the gender, social and cultural differences in the Singapore population. Currently, we are assessing alternative items to replace those not suitable so as to construct an ADL survey more suitable for the elderly population of Singapore.

Common Misconceptions about Traumatic Brain Injury among Patients and their Immediate Family Members

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Aim: To investigate the common misconceptions about traumatic brain injury (TBI) among patients or their immediate family members.

Method: Survey questionnaires were composed of 40 statements categorised into 8 different domains, ranging from TBI prevention to recovery from brain injury. It was administered to a convenience sample of TBI patients admitted to the National Neuroscience Institute from June to August 2004 or their immediate family members.

Results: There was a full response rate from 100 respondents, with a mean age of 41 ± 17.26 years (range, 15 to 85 years). Among them, 63% were male. Patients constituted 63% of respondents; spouse, 6%; children 20% and others, 11%. The educational level of the participants ranged from no formal education (11%), primary (24%), secondary (28%), tertiary and above (37%). The results indicated substantial levels of misconceptions on the nature of unconsciousness (56.5%), brain damage (63%), amnesia (63.25%), brain injury sequelae (50.1%), recovery from brain injury (54.18%), and rehabilitation (63.5%) as compared to misconceptions on prevention (41.2%) and recognition of signs and symptoms (36.5%). The most common misconception statements were the belief that a second blow to the head can sometimes help a person remember things that were forgotten and that it is necessary for a person to go through a lot of physical pain to recover from a brain injury.

Conclusions: Misconceptions held by both patients and their family members may lead to unrealistic expectations on the sequelae and recovery process of TBI, which can be addressed through patient/family education. This study highlighted key issues that need to be addressed by health care professionals.

Is Physical Cooling Necessary? A Nursing Study to Investigate the Effectiveness of Tepid Sponging and Cold Compress in Fever Management of Adult Patients

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Aim: Recent research findings emphasised the beneficial host responses against infection and tumours during temperature elevations and the ability of the body to produce endogenous antipyretic substances that reduce or set an upper limit to temperature rise during fever (Holtzclaw 2002). Traditional and commonly used interventions to lower an elevated temperature include tepid sponging and the application of cold compress. Hence, it is important to investigate the effectiveness of these 2 interventions in fever management. The aim of this study was to investigate the effectiveness of tepid sponging and cold compress in lowering the temperature of adult febrile patients in an acute setting.

Methods: A quasi-experimental design was adopted and a data collection form used to gather relevant information. A total of 137 patients were recruited. Data were analysed using descriptive and inferential statistics.

Results: Results showed that there is no conclusive clinical benefit from physical cooling in febrile adult patients. There was a significant reduction in temperature of subjects over time in all 3 groups (tepid sponging, cold compress and control). Not imposing any physical cooling measures was significantly non-inferior to receiving cold compress at all designated time intervals when comparing the temperature variation of subjects.

Conclusion: Greater efforts should be made to support the body's beneficial physiological responses to infection and to base nursing interventions on thermoregulatory principles. Emphasis should be placed on close monitoring of temperature, adequate hydration etc., instead of physical cooling measures that have not been shown to be consistently effective.

Effectiveness of Surgical Bras in the Immediate Postoperative Phase for Breast Cancer Patients

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Aim: Breast cancer is the number one cancer in women in Singapore. Ninety per cent of the 600 new cases operated in SGH every year undergo breast-conserving surgery or total mastectomy with or without axillary dissection. Most of these women prefer not to wear a bra after surgery for fear of hurting the wound. However, some women have mentioned that they have no support of the chest after surgery. Developing seroma (the accumulation of fluid at the surgical site and under the axilla) is common in patients after axillary

clearance (the removal of axillary lymph nodes in invasive breast cancer). However, studies have shown that applying pressure post-surgery could help to reduce seroma formation. A large number of women are concerned about chest support post-surgery. Therefore, this study was undertaken to determine if the surgical bra provides sufficient comfort and support to the chest wall, enhances body image and reduces seroma formation.

Methods: A total of 100 patients were recruited during the preoperative counseling session at the Specialist Outpatient clinic. It is a randomised design using a questionnaire. The experimental group was made to wear the surgical bra within 3 hours of returning from the theatre. The bra was fitted with 4 pieces of gamgee pad to provide comfort. Both groups continued with the existing exercise programme and were discharged home with their drainage tube on the first or second postoperative day. All subjects were monitored for a period of 2 weeks using the questionnaire.

Results: Eighty-six per cent of the patients using the surgical bra verbalised support compared to 38% of the control group (P <0.0005 by chi-square). Ninety per cent of the patients in the experimental group were pain-free compared to 56% in the control (P = 0.008 by chi-square). Ninety per cent experienced comfort compared to 47% in the control group (P = 0.002 by chi-square). A larger volume of fluid was drained with the surgical bra group using Anova with repeated measures (P = 0.05).

Conclusion: This study showed that the surgical bra provided better support and comfort for the chest wall of patients post-breast surgery. The findings also showed a significant increase in the volume of fluid drained in the surgical bra group but further evaluation is needed to observe for any seroma formation after removal of drain.

Effect of Pelvic Floor Re-education on Duration and Degree of Urinary Incontinence after Robot-assisted Laparoscopic Prostatectomy

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Aim: Robot-assisted laparoscopic radical prostatectomy (RLRP) has become a feasible practice in Singapore General Hospital for the treatment of localised prostate cancer. Urinary incontinence is a significant cause of postoperative morbidity after a radical prostatectomy. This prospective and consecutive study aimed to assess continence rate after RLRP and to investigate whether there was any beneficial effect of pelvic floor re education for patients' urinary incontinence after RLRP.

Methods: A total of 73 consecutive patients undergoing RLRP from January 2003 to December 2004 were recruited into the study. Patients in control group (n = 15) had no formal training of pelvic floor re-education whilst the experimental group (n = 58) had the full training done by a dedicated trained continence nurse. Patients in the experimental group were also given instructions to continue pelvic floor muscle exercise thrice daily at home after surgery. Using a self-reporting urinary continence questionnaire, the patients were followed prospectively at pre- and postoperative intervals of 3, 6 and 12 months. Incontinence was measured by the number of pads used, with 0 daily defined as continence.

Results: The mean age at diagnosis was 63.43 ± 5.67. The mean duration of postoperative catheterisation was 8.41 ± 4.01 days. Of the total subjects, 55.7% achieved continence at 3 months and 77.3%, at 6 months. Continence rates in the control group at 3, 6 and 12 months were 53.3%, 60% and 86.7%, respectively. Continence rates for the experimental group at 3 and 6 months were 56.5% and 86.2%, with a statistical significance seen at 6 months (P = 0.049). On comparison at 3 months, the experimental group achieved improvement in both duration and degree of continence (chi-square P = 0.05) to that of the control group.

Conclusion: Pelvic floor re-education should be considered as the first-line option in the early management of post-prostatectomy urinary incontinence. It offers a comprehensive evaluation and treatment plan for the patients and the potential to improve continence rates after surgery.

Acute Pain Management: "First Cry: Last Cry"

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Aim: To improve pain assessment and documentation in the acute tertiary care hospital in Singapore. Pain studies consistently report that pain has been poorly understood, underreported and inadequately managed. The assessment and measurement of pain are fundamental for patients in acute pain to be adequately managed. A systematic approach is necessary to educate health care professionals, patients and family for pain to be adequately managed. This paper will trace the approaches undertaken by the nurse-led team to make pain the fifth vital sign.

Methods: The anaesthetist leads the acute pain service in the hospital. Nurses reviewed the case studies, research papers and educational materials and found that pain was inadequately assessed and managed despite the presence of an acute pain team in Singapore General Hospital. A proposal to make pain the fifth vital sign was presented and approved by management. The multidisciplinary team comprising anaesthetist, palliative care team, surgeon, nurses, pharmacist and physical therapist was formed to develop a policy, review records on pain assessment, education and develop an improved record to document pain. After management approval, road shows to brief all staff started in December 2003. Pain as the fifth vital sign was launched in April 2004. Monthly audits have been conducted since May 2004 to track the staff awareness of the pain policy, the need to assess pain as the fifth vital sign, consistency in ensuring the pain measurement scale that the patient comprehends best is used by nurses and doctors when assessing the patient.

Results: The monthly results showed an ascending improvement for pain assessment (47% to 97%), education (60% to 95%), documentation (58% to 95%), and knowledge (86% to 96%).

Conclusion: Regular audits and feedback is the key to driving change in a large organisation. Patient and family education should include the self-report of acute pain early and to provide a detailed assessment of their pain to the health care professional.

A Study on Knowledge, Attitude and Practice toward Self-care in Management of Diabetes Mellitus Patients in Polyclinics

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Aim: This cross-sectional descriptive study explored the knowledge, practice and attitude of type II diabetes patients.

Methods: A convenience sample of 91 subjects was prospectively recruited from Bukit Merah and Tampines Polyclinics from December 2003 to January 2004. Data were collected using an interviewer-administered structured questionnaire. Categorical data were expressed as percentages and analysed using chi-square test and

Fisher's exact test SPSS version 12.1.

Results: The findings revealed that subjects with only primary or secondary education had less knowledge than those with a tertiary education. The majority of the subjects in all 3 educational groups had obtained their information from health care professionals. Subjects with only primary education (90.3%) or secondary (97.1%) education were more compliant in taking medicine as prescribed by doctor than those with tertiary education (50%). The majority of subjects with only primary (82%) or secondary education (86.8%) had attended eye screenings, as compared to those with tertiary (50%). All the subjects agreed that individual counseling was beneficial to them.

Conclusion: Improving patients' knowledge on diabetes is critical for self-care management. Regular assessment of patient's skills and knowledge is important in order to identify specific patient characteristics that may help them to improve in self-care. Findings from this study can be used to review present health education strategies to enhance patients' awareness with regard to self-care and adherence to treatment goals.

Evaluating the Incidence of Raised Intra-ocular Pressure after Pupil Dilation among Patients with Diabetes Mellitus

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Aim: To evaluate the incidence of raised intra-ocular pressure (IOP) after pupil dilation among patients with diabetes mellitus.

Methods: In this prospective study, IOP was measured before and after pupil dilation for newly referred diabetic patients at the Diabetic Retinopathy Service clinic of Singapore National Eye Centre. A designated Airpuff applanation tonometer was used to measure subjects' IOP by the same researcher before and 1 hour after pupil dilation. Pupil dilation was defined as a pupil size of at least 5 mm. Raised IOP was defined as an increase of 5 mm Hg or more compared to pre-dilation measurement.

Results: Three hundred and twenty consecutive newly referred diabetic patients were recruited into the study. There were 130 males (40.6%), 190 females (59.4%) and the mean age was 63.9 years old. Seventy-five per cent were Chinese, 10.9% were Malay and 12.5% were Indian. Of the 320 patients, only 5 patients (1.56%) were found to have raised IOP. None of these patients developed an episode of acute angle closure. Twenty-four of these patients had IOP >21 mm Hg pre-dilation, which suggests that they may have underlying glaucoma.

Conclusions: In newly referred diabetic patients, routine pupil dilation for examination of the fundus is associated with a low incidence of raised IOP after pupil dilation.

Nursing Oral Papers
Best NHG Oral Paper Award Finalists

Characteristics and Risk Factors of Repeaters of Deliberate Self-harm: a Preliminary Study (Phase I)

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Aim: Deliberate self-harm (DSH) attempters use up considerable resources when admitted to general hospitals. To best utilise health personnel, it is necessary to be able to identify the attempters who are most likely to reattempt DSH. Preventing the repetition of DSH offers a potential saving of health care resources. The objective of this study was to compare the characteristics of first-timers and repeaters of DSH referred to the local university's Psychiatric Consultation Liaison (P-CL) unit, to help identify the risk factors for repetition of DSH.

Methods: Detailed information of all consecutive DSH cases from 1 May 2002 to 1 January 2004 were gathered using a structured format. A total of 781 DSH cases were identified: 66% were non-repeaters and 34% were "repeaters", 70.8% were females and the majority was Chinese. A psychiatric nurse was trained on suicide risk assessment and performed all the assessments. The association between repetition and certain factors were studied.

Results: Preliminary results showed an association between repetition and the following individual factors: being of Chinese race, being of female gender, being aged between 45 years and 49 years at the index attempt, being divorced or separated, having a gambling habit, promiscuity, having been abused sexually, a history of alcohol abuse, and a previous DSH attempt. The index attempts of repeaters were characterised more often by cutting oneself or gassing.

Conclusion: The findings of this study, if confirmed, may be useful in planning appropriate nursing interventions for the prevention of repetition. A challenge would be to explore an effective intervention to cater to this specific group of patients.

Simple Antenatal Preparation to Improve Breastfeeding Practice: a Randomised Controlled Trial

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Aim: Breastfeeding practice in Singapore is suboptimal. This randomised controlled trial addresses the impact of simple breastfeeding education in the antenatal period on breastfeeding practice in a general obstetric population.

Methods: Low-risk obstetric patients were recruited from antenatal clinics between May 2002 and December 2003. Women were randomised into 3 groups. The first group (A) received breastfeeding educational material and a single short session of lactation counselling. The second group (B) received breastfeeding educational material but no counselling. The control group received routine antenatal care only. Thereafter, routine intrapartum and postpartum care were given to all the women. Data regarding initiation, duration and mode of breastfeeding were collected by questionnaires at predetermined intervals.

Results: Four hundred and one women consented to participate in the trial: 123 women were assigned to group A, 132 women to group B and 146 women to group C. Mothers who received breastfeeding educational material as well as lactation counselling practised exclusive or predominant breastfeeding more often than mothers who received routine antenatal care at 3 months (OR 2.6; 95% CI, 1.2 to 5.4) and at 6 months (OR 2.4; 95% CI, 1.01 to 5.7) following delivery. There was also a trend towards better breastfeeding practice in mothers who received educational material without counselling compared to mothers who received routine antenatal care.

Conclusion: Simple one-encounter antenatal breastfeeding education and counselling significantly improves breastfeeding practices up to 6 months after delivery. Healthcare workers caring for pregnant women should make every effort to discuss and educate breastfeeding with expectant mothers before they deliver.

Characteristics of Patients with Repeat Attendance at Emergency Department for Asthma Exacerbations

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Aim: To identify demographic characteristics of patients with repeat Emergency Department (ED) attendance for asthma exacerbation.

Methods: Analysis of computer database records of all patients who were treated and discharged from the ED of a tertiary hospital over 6 months in the year 2004 for asthma. Data analysed included demographic characteristics such as age, sex, ethnicity and ED attendance in the past 40 days and past 24 hours for acute asthma.

Results: Seven hundred and fiffty patients with a male to female ratio of 1:1 were seen at the ED for asthma exacerbation, and 195 had previous attendance either in the last 40 days or 24 hours or both. The median age of our patients was 32 years (range, 2 years to 92 years). Forty-two per cent of the patients were Chinese, 29% were Malays, 23% were Indians and 7% were of other ethnicity. Multivariate analysis showed that male sex (OR 3.03; $P < 0.0001$), Malay ethnicity (OR 2.30; $P = 0.04$) and age 21 years and below (OR 1.61; $P = 0.015$) were associated with increased risk of repeat ED attendance. Although there was an observed higher percentage of default rate for outpatient follow-up in patients with repeat ED attendance compared to those without, it did not reach statistical significance (54.6% versus 46.2%, $P = 0.16$).

Conclusion: Male sex, Malay ethnicity and age of 21 years and below were associated with higher risk of repeat ED attendance in our asthmatic patients. However, we did not find any association between repeat ED attendance and subsequent follow-up default rate in our patients.

General Practice Oral Papers
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Home Blood Pressure Monitoring amongst Hypertensive Patients in an Asian Population

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Aim: Hypertension is a principal cause of mortality and morbidity in Singapore. Home blood pressure monitoring (HBPM) as an indicator of hypertensive control is increasingly popular in the West but its usage with digital devices in the local multiracial population is unknown. The study determined hypertensive patients' use of HBPM in primary care.

Methods: Randomised cross-sectional questionnaire survey of hypertensive patients managed in a district polyclinic. A model predicting use of HBPM was constructed using univariate and multivariate logistic regression.

Results: Two hundred and twenty-four eligible subjects were randomly selected from 1943 patients with a response rate of 78.1% (n = 175). Of the subjects, 61.7% were aware of HBPM but only 24 % used HBPM. HBPM was associated with patients' higher socioeconomic status and educational level and their documented diastolic BP using multivariate analysis. Non-users cited a failure to recognise benefits (56.4%), a lack of HBPM awareness (20.3%) and understanding of device operation (18.8%), and cost (14.3%) as deterrents. Users were generally satisfied with HBPM but lacked knowledge in the maintenance of devices.

Conclusion: Of the study population, 24% used HBPM. Patients' failure to recognise benefits and lack of awareness, the cost and patients' perception of inaccuracy were barriers. Higher socioeconomic status and patients' documented diastolic BP correlated with HBPM usage.

Use of Sweetener amongst Type 2 Diabetic Patients in an Asian Population

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Aim: Diabetes mellitus is a prevalent chronic disease in Singapore and dietary control is the first line of management. As most Asians include refined sugar in their diet, sweetener is often used as a sugar substitute for diabetic patients. The study aimed to determine the prevalence, attitude and perception of the use of sweetener amongst type 2 diabetic patients managed at a district primary care polyclinic.

Method: This was a cross-sectional survey using nurse-administered questionnaire to type 2 diabetic patients recruited on a case encounter basis. Users of sweeteners were defined as current consumers or those who had taken sweetener at least once in the past month. Proportions were used to describe categorical variables and chi-square test was used to assess differences.

Results: In this study, 75.3% of type 2 diabetic patients had used sweeteners. Most users were 50 to 69 years of age, with primary or no education. The perceptions that sweeteners would cause harm, cancer, were inconvenient to use and were expensive, had an unacceptable taste, or tasted differently, would deter their use. A receptive attitude and the perception that sweetener would improve diabetic control appeared to encourage sweetener use.

Conclusion: Diabetic patients' use of sweetener was prevalent in Singapore. Safety, cost, taste and convenience were the main concerns amongst these patients.

Diabetic Retinopathy Study

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Aim: To determine the severity of diabetic retinopathy on the first diabetic eye screening of patients with diabetes mellitus, outline the patients' demographics, study their knowledge, health beliefs and to evaluate the percentage of them requiring laser or surgical intervention.

Methods: A prospective multi-centered cohort study. The inclusion criterion included every consecutive patient with a medical history of diabetes mellitus seen in eye clinics of 6 public hospitals for diabetic eye screening. Each patient was interviewed by a trained research assistant. The degree of diabetic retinopathy was assessed by ophthalmologists and appropriate treatment was given according to guidelines from the Early Treatment Diabetic Retinopathy Study.

Results: A total of 923 patients were recruited. The majority of them (79%) were between 41 and 70 years old. 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. Forty per cent of them knew that diabetic retinopathy could cause blindness. Only 61% had yearly diabetic photographic eye screening. Hypertension and hyperlipidaemia were present in 45% and 32% of them respectively, and 11% had underlying heart disease. 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 informed of the condition as well as the importance of diabetic eye screening.

Screening for High Blood Pressure, Diabetes Mellitus and High Cholesterol in Singapore – An Interim Report

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Aim: To determine the prevalence of screening for hypertension, cholesterol and diabetes mellitus in Singapore.

Methods: A population-based survey on screening for hypertension, diabetes mellitus and hypercholesterolaemia, involving Singaporean residents aged 15 years to 69 years was carried out since December 2004 and is ongoing. The households were randomly selected by the Department of Statistics. Interviews were carried out by surveyors trained to use a standard questionnaire to elicit information. Data were analysed using SPSSv13.

Results: Preliminary analysis of 1400 respondents, as of 13 June 2005, whose demographic characteristics (age, ethnicity and educational status) correspond to the general population, found that there were 895 people without any known chronic diseases; i.e., hypertension, diabetes mellitus, hypercholesterolaemia, heart disease, stroke/transient ischaemic attack (TIA). Of these, 478 (53.4%) were aged 40+ years, which is the target group recommended by the Ministry of Health (MOH) for screening for cholesterol, hypertension and diabetes mellitus. Of the 478 persons aged 40+ years, 380 (79.5%) had their blood pressure checked in the preceding year, but only 294 (61.5%) had been screened for diabetes mellitus and 254 (53.1%) had been checked for high cholesterol.

Conclusion: While the prevalence of blood pressure screening among persons aged 40+ years was high, more needs to be done to screen for diabetes mellitus and high cholesterol. Wherever possible, cholesterol screening should be offered together with diabetes screening, in line with MOH guidelines.

Weight Management – Pilot Programme at Clementi Polyclinic (April 2004 to April 2005)

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Aim: The prevalence of obesity has increased worldwide. Among the 18- to 69-year-old patients involved in the National Health Survey (Singapore), the percentage of those who were obese increased from 5% in 1992 to 6.9% in 2004. A pilot weight management programme was started at Clementi Polyclinic (NHGP) to assess the effectiveness of a modified programme at the primary healthcare level in a busy polyclinic setting.

Methods: Thirty-five obese patients with chronic medical conditions (e.g., diabetes mellitus, hypertension) were recruited in April 2004. At each of their 2 to 3 monthly visits to the polyclinic for their chronic conditions, the nurse counselled them on dietary, exercise and behaviour modification. Their weight and other clinical indicators were collated after a year.

Result: Nineteen (54.3%) of the 35 patients completed the programme. Fifteen (78.9%) of them lost weight. The average weight loss for these 15 patients was 5.7% of their original weight. There were also improvements in their blood pressure, HbA1C (for the diabetics) and LDL cholesterol levels.

Conclusion: With careful planning, effective weight management is possible in a busy polyclinic.

Urinary Cytokine Responses of Bladder Cancer Patients Receiving Bacille Calmette-Guerin Immunotherapy Provide Insight into the Development of New Protocols

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Aim: Intravesical bacille Calmette-Guerin (BCG) immunotherapy is the gold-standard treatment for high-risk superficial bladder cancer, despite having frequent, potentially serious side effects. Instillation schedules are largely empirical. Urinary inflammatory cytokines are found in untreated and BCG-treated bladder cancer patients. This study analyses urinary cytokine production patterns in patients treated with the commonly used 6 weekly instillations plus 3 boosters (6+3) schedule.

Methods: Enzyme-linked immunosorbent assay (ELISA) of urinary cytokines was performed in 35 patients with bladder cancer before and after receiving BCG immunotherapy. The results were analysed.

Results: BCG exerts a predominantly Th-1 cytokine response, which is moderated by the antagonistic cytokine interleukin-10. There is a secondary local immune response in the bladder to repeated BCG instillations. The full magnitude of this response is not realised during the first 6 instillations because of "damping" by interleukin-10. Re-stimulation of the bladder after a period of rest demonstrates the true magnitude of this response. In the 6+3 schedule, there are decreases in interleukin-2 and interleukin-6 in the 6th and 9th BCG instillations, suggesting that these instillations cause overstimulation of the local inflammatory response and should possibly be omitted. The addition of interferon alpha to BCG augments production of the key cytokine, interferon gamma. Using a one-third dose of BCG produces similar cytokine responses as a full dose of BCG.

Conclusion: These data suggest that an optimised schedule may consist of only a one-third dose of BCG in 4 or 5 weekly instillations, followed by 2 booster instillations after 6 weeks' rest (4/5+2), which potentially reduces treatment side effects while maintaining efficacy.

Focused Parathyroidectomy for Parathyroid Adenoma: Use of Mini-incision in the Neck and Intraoperative Parathyroid Hormone Assay

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Aim: To study the role of focused parathyroidectomy for patients with primary hyperthyroidism and positive localisation on sestamibi nuclear scintigraphy.

Methods: Patients who had successful preoperative parathyroid localisation with a diagnosis of primary hyperparathyroidism were included in the study. They all underwent sestamibi-technetium nuclear imaging localisation. All patients under general anaesthesia had a 2-cm neck incision. A low midline neck incision was performed for the inferiorly located parathyroid, while a superior lateral incision for the superiorly located gland. Intraoperative parathyroid hormone (PTH) assay was obtained from the internal jugular vein and was utilised by comparing 2 venous samples – one prior to parathyroid excision and another 7 minutes after excision. Successful excision resulted in a drop in the post-excision PTH level by more than 50% (Roche Elecsys 2010).

Results: From 2001 to 2005, 24 patients (7 males and 17 females; mean age, 60 years) underwent focused parathyroidectomy. Intraoperative PTH assay showed a mean decline of 78% after removal of the parathyroid adenoma. There were no complications. All patients were cured and had normal serum calcium and PTH levels during follow-up.

Conclusion: Focused parathyroidectomy is feasible and successful in patients with primary hyperparathyroidism and who have positive localisation on sestamibi imaging. The advantages are the small neck wound and short hospital stay. Intraoperative PTH assay is useful in confirming successful excision of parathyroid adenoma.

Effect of Supplemental Intracameral Lidocaine on Pain Experienced during Cataract Surgery under Topical Anaesthesia – Results of a Placebo-controlled, Double-blind, Randomised Trial

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Aim: To determine whether supplemental intracameral lidocaine reduces pain experienced during cataract surgery under topical anaesthesia.

Methods: Five hundred and six cataract patients undergoing phacoemulsification under topical anaesthesia were randomised to receive a supplemental injection of either 0.5 mL of 1% intracameral lidocaine or balanced salt solution (BSS). The injected fluid was left in the anterior chamber for 1 minute prior to capsulorrhexis. The pain experienced was scored on a visual analogue scale of 1 to 10, where 10 represents the most severe pain.

Results: There were no significant differences in demographics between the lidocaine (277 patients, 54.7%) and BSS (229 patients, 45.3%) groups. One hundred and twenty-five patients (45.1%) experienced pain in the lidocaine group, compared to 123 patients (53.7%) in the BSS group ($P = 0.061$). The mean pain score (± SD) of all patients who received lidocaine was 1.38 (± 2.18) compared to 1.61 (± 2.12) for patients who received BSS ($P = 0.243$). The median pain score (range) was 0.00 (0 to 10) for intracameral lidocaine compared to 1.00 (0 to 10) for BSS ($P = 0.039$). Chinese patients were less likely to experience pain (205 patients, 46.9%) compared to non-Chinese (43 patients, 62.3%) ($P = 0.020$). Female patients were more likely to experience pain (139 patients, 54.3%) compared to males (109 patients, 43.6%) ($P = 0.017$). There was no significant association between a painful experience and the age of the patient.

Conclusion: The use of 0.5 mL of 1% intracameral lidocaine during phacoemulsification under topical anaesthesia reduces pain experienced by patients. Female and non-Chinese patients were more likely to experience pain during the surgery.