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SHBC 2015

Singapore Health & Biomedical Congress

Advancing Healthcare Into The Future: Innovate, Improve, Integrate

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Singapore Health & Biomedical Congress (SHBC) 2015

CONTENTS

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BP-AH-01

Identification of Malnutrition Risk Factors and Validation of a Nutrition Screening Tool in Singapore Intermediate- and Long-Term Care Settings

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Background & Hypothesis:
Nutrition screening is important for early identification and management of malnourished patients in intermediate- and long-term care (ILTC) settings. However, little is known of a validated nutrition screening tool and the malnutrition risk factors in this patient population. The study aimed to identify the risk factors for malnutrition and to validate a nutrition screening tool (NST-ILTC) in Singapore ILTC.

Methods:
This cross-sectional case-control study included 120 and 127 patients from a community hospital and nursing home, respectively. Nutrition screening and assessment using the NST-ILTC and Subjective Global Assessment (SGA) were completed by a dietitian. Regression analysis was used to identify the risk factors for malnutrition. Receiver operating characteristic analysis and diagnostic performance of the NST-ILTC was compared against SGA to determine area under the curve (AUC), sensitivity, specificity, positive and negative predictive values.

Results:
Sixty cases (malnourished) and 187 controls (well nourished) were identified. Malnourished patients were older (77.6 +/- 10.7 vs 73.9 +/- 12.4 years, $P = 0.04$) and had lower body mass index (17.0 (15.7, 19.9) vs 20.5 (18.0, 23.9) kg/m^2, $P \leq 0.01$). Being underweight (OR = 9.48), experienced significant weight loss (OR = 12.28) and persistently decreased oral intake (OR = 25.94) were significant risk factors for malnutrition (all $P <0.01$). The AUC, sensitivity, specificity, positive and negative predictive values of the NST-ILTC against SGA were 0.88, 77%, 83%, 59%, and 92%, respectively.

Discussion & Conclusion:
The NST-ILTC is a valid nutrition screening tool with good diagnostic performance for early detection of malnutrition in Singapore ILTC. Weight and intake monitoring in ILTC are important in identifying those at risk of malnutrition.

BP-AH-02

Attitudes and Predictive Factors of Hospital-based Healthcare Workers towards Seasonal Influenza Vaccination in the Post-SARS Era: Systematic Review

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Background & Hypothesis:
Annually, seasonal influenza causes a significant disease burden worldwide. Despite recommendations and guidelines by health authorities, the uptake of influenza vaccination among healthcare workers (HCWs) remains low.

Methods:
Relevant original and review articles published from 1 January 2003 to 31 March 2015 were identified using the search terms: "knowledge", "attitude", "practices", "belief", "influenza", "vaccination", "flu", "flu vaccine", "healthcare worker", "hospital healthcare worker", "Singapore", in PubMed Central, PubMed, Google Scholar and Cochrane Library databases.

Results:
We identified 78 studies, 18 of which were included in our review. Influenza vaccination rate ranged from 4% to 93%. Barriers that were consistently reported by HCWs were wide ranging but usually stemmed from misconceptions of influenza infection and influenza vaccine such as fear of vaccine adverse reactions (4-64%), doubts about vaccine efficacy (10-60%) and lack of perception of infection risk (16-58%). On the other hand, self-protection (38-95%) was found to be the most common motivator for those who got vaccinated. As for predictive factors, we included 10 studies, and identified that previous receipt of influenza vaccination was the most described positive factor with the strength of association ranging from 4.6 (95% CI 1.8-12.8) to 36.0 (95% CI 21.4-60.8).

Discussion & Conclusion:
Hospitalised patients are at risk of complications from influenza infection. It is crucial to improve influenza vaccination acceptance and uptake among HCWs to prevent nosocomial transmission. Education on influenza infection and vaccine to address HCWs' misconceptions, and the provision of influenza vaccination services at HCWs' work areas ("doorstep") could increase HCWs' uptake of influenza vaccination.

BP-AH-03

Estimating 10-Year Cardiovascular Disease Risk in Patients with Schizophrenia

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Background & Hypothesis:
Patients with schizophrenia have a 20% reduced life expectancy when compared to the general population, with cardiovascular diseases being one of the major causes for early mortality. The Framingham risk score (FRS) is a well known gender-specific multivariable risk factor algorithm, which can be used in the clinical setting to estimate 10-year cardiovascular disease (CVD) risk and risk of individual CVD events. This study aims to describe the cardiovascular risk profile of a sample of patients with schizophrenia.

Methods:
A total of 113 patients with schizophrenia were recruited from the Institute for Mental Health, Singapore for the study. Their medical and smoking histories were obtained, and anthropometric parameters measured. FRS calculator using body mass index was used to compute the 10-year CVD risk and the vascular age (VA) for each participant.

Results:
The mean 10-year CVD risk was 6.8%, and was significantly higher in males compared to females (P <0.001). Mean VA of the sample was higher than the mean actual age, with a difference of 5.4 years. Twenty-four (21.2%) participants had intermediate to high CVD risk (FRS >10%). Thirty-two (28.3%) participants were obese and 79 (69.9%) had increased waist circumference.

Discussion & Conclusion:
We found a high risk of CVD and its risk factors in the local schizophrenia population. Our findings emphasise the need for regular physical health monitoring, especially of CVD-related risk factors in patients with schizophrenia. Integration of mental and physical health systems is needed to manage individuals with serious mental illness.

BP-BSTR-01

Exon Sequencing of the *APOE* Gene to Identify Variants Responsible for the Monogenic Basis of Chronic Kidney Disease

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Background & Hypothesis:
In Singapore, the rate of chronic kidney disease (CKD) is increasing rapidly. Lipoprotein glomerulopathy (LPG) is a heritable form of CKD caused by mutations in the *Apolipoprotein E (APOE)* gene. We hypothesised that *APOE* variants are implicated in monogenic forms of CKD that account for the observed diabetic nephropathy (DN) as they share similar clinical phenotype i.e. proteinuria and hypertriglyceridaemia.

Methods:
A case-control study was assembled from our Chinese DN cohort. Cases (n = 34) are subjects with DN i.e. spot urinary albumin over creatinine ratio (ACR) $\geq$300 mg/g and hypertriglyceridaemia (TG $\geq$2.0 mM) not attributable to poor glycaemic control (i.e. HbA1c <8%) or gross adiposity (i.e. BMI <27.7 kg/m^2, mean value in our cohort). Controls (n = 48) are long standing T2DM (>10 years) with pristine renal function i.e. ACR <30 mg/g and serum creatinine $\leq$112 μM. Deep sequencing of *APOE* exons using next-generation sequencing (NGS) was performed.

Results:
No other variant was identified apart from the 3 common *APOE* polymorphisms: ε2, ε3 and ε4 (ε3 is the wildtype allele). The allelic frequencies of ε2, ε3 and ε4 in cases were 5.88%, 73.53% and 20.59% respectively, as compared to 0%, 93.75% and 6.25% in controls. The presence of either ε2 or ε4 allele increased DN risk as compared to the ε3 allele (odds ratio = 5.40, 95% CI: 1.34-21.79, *P* = 0.023).

Discussion & Conclusion:
The ε2/ε4 allele conferred susceptibility to DN in our study cohort. These interesting observations call for a further study in a larger cohort with similar clinical profiles.

BP-BSTR-02

Specific Knockdown of Long Thymic Stromal Lymphopoietin (TSLP) Variant Using Antisense Oligonucleotide

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Background & Hypothesis:
Thymic stromal lymphopoietin (TSLP) is an IL-7-like cytokine that triggers dendritic cell-mediated T helper (Th2) inflammatory responses, and has been called the master switch in the pathogenesis of atopic dermatitis. Recent studies reported that there are 2 different TSLP splice variants with the long form is associated with allergic inflammation. Aintisense oligonucleotide (AON) is a synthetic single-stranded DNA or RNA molecule that can be designed to bind to a specific sequence in the targeted RNA. AON has been used as drug in few human diseases. Our study aims to selectively downregulate the long form TSLP using AON.

Methods:
Using our proprietary computational high-throughput AON design platform, we selected the AON target sites in TSLP pre-mRNA which are specific for the long form. AONs complementary to the predicted sites were synthesised. Efficacy and specificity of these AONs in suppressing the long TSLP variant were then validated in a cell culture model.

Results:
We designed and tested 2 AONs targeting long TSLP along with a scrambled AON as control. The 2 AONs showed to be efficacious to specifically target the long form of TSLP.

Discussion & Conclusion:
This study further reaffirms the advantage of AON when compared to small molecule and siRNA as potential therapeutics. The versatility of targeting any part or RNA, a limitation owned by small molecule and siRNA, allow AON to selectively target certain molecule variant. The results of this study may also potentially lead to the development of a molecular targeted therapeutics for atopic dermatitis.

BP-BSTR-03

The Adaptor Protein CG-NAP/AKAP450 Maintains Cytoskeleton and Golgi Integrity in Migrating T-Cells

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Background & Hypothesis:
The mobilisation and deployment of T-lymphocytes to tissue-sites of inflammation is essential for an adaptive immune response. This process is critically dependent on the integrin LFA-1-mediated signalling and cytoskeletal rearrangements facilitated by adaptor proteins. Here, we show a crucial role of an adaptor protein centrosome- and Golgi-localised protein kinase N-associated protein (CG-NAP, also called AKAP450) in T-cell migration.

Methods:
A migration-triggering model system, in which human primary T-cells or cultured HuT78 T-cells are stimulated to migrate via LFA-1/ICAM-1 cross-linking, was used. Cellular responses were determined using standard molecular and imaging techniques including RNA interference-mediated gene-silencing, Western-immunoblotting, confocal microscopy and high content analysis.

Results:
Both primary and HuT78 T-cells were found to express CG-NAP/AKAP450, which was localised in the centrosomal regions showing distinct co-localisation with Î³-tubulin. Further, we detected partial co-localisation of CG-NAP/AKAP450 with CLASP2 and cis- and trans-Golgi structures in motile T-cells. RNA interference-mediated silencing of CG-NAP/AKAP450 (>70% knockdown) caused Golgi fragmentation accompanied by ~2-fold decreased expression of GM130 and CLASP2 proteins. CG-NAP/AKAP450 knockdown interfered with tubulin post-translation modifications, acetylation and tyrosination, which are essential for maintaining cytoskeleton and Golgi architecture. Furthermore, CG-NAP/AKAP450 knockdown significantly inhibited LFA-1-induced T-cell migratory phenotypes (1/form-factor 2.08 in control vs 1.58 in CG-NAP/AKAP450 depleted T-cells) as determined by high content analysis.

Discussion & Conclusion:
We demonstrate a novel mechanism by which the adaptor protein CG-NAP/AKAP450 regulates T-cell migration. Tunable targeting of CG-NAP/AKAP450 functioning in T-cells using approaches such as use of RNA interference or blocking peptides could provide a new strategy for modulating local inflammatory responses.

BP-CR-01

Executive Function and Education Mediate Willingness in Advance Care Planning Engagement in People with Early Cognitive Impairment

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Background & Hypothesis:
Advance care planning (ACP) is essential in the holistic care for people with early cognitive impairment (ECI) who are still mentally capable of making rational decisions. This study explores the willingness of people with ECI to engage in ACP and how socio-demographic and clinical variables affect their choices.

Methods:
Ninety-seven subjects with ECI (mild cognitive impairment or early dementia, clinical dementia rating = 0.5/1.0), assessed to have adequate insight (Clinical Insight Rating Scale) underwent an individualised ACP information session using the Respecting Choices® approach. They were also assessed on their knowledge of dementia and willingness to engage in ACP, and had earlier undergone evaluation of their cognition (Frontal Assessment Battery and Mini Mental State Examination) and mood, namely: anxiety (Short-form Geriatric Anxiety Inventory) and depression (Geriatric Depression Scale 5-item) in the memory clinic. Univariate analysis and logistic regression explored factors (socio-demographic and clinical) that predicted the subjects' willingness to engage in ACP.

Results:
Fifty-two subjects (54%) were keen on ACP. On both univariate and multivariate analysis, subjects with better executive function (Frontal Assessment Battery) (t = -3.63, P <0.0001) and higher educational level (t = -2.11, P = 0.038) predicted keenness to engage in ACP.

Discussion & Conclusion:
Better education and higher executive function mediate willingness to engage in ACP. These factors are contributory to a person's aptitude to attain knowledge and process information. Initiating ACP discussions early in the disease, enhancing knowledge and awareness of ACP and providing tailored information are important interventions that facilitate the completion of ACP.

BP-CR-02

Rapid Clinical Progression among Patients Infected with *CRF51_01B*, an Emerging *HIV-1* Recombinant in Singapore

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Background & Hypothesis:
HIV-1 infection with *CRF01_AE* is associated with rapid clinical progression and poorer immunologic recovery on treatment when compared with subtype B. We compared disease progression and immunologic recovery of patients infected with *CRF51_01B*, a novel *HIV-1* recombinant, with the parental *CRF01_AE* and subtype B.

Methods:
In this retrospective cohort study at the Singapore CDC, the primary outcomes examined were the proportion of treatment-naïve patients with AIDS at presentation, median presenting CD4+ T-cell count, rate of CD4+ T-cell decline, pre-antiretroviral (ART) viral load, time from presentation for care to ART initiation and immunologic outcomes at 6 to 15 months post-ART.

Results:
A total of 429 treatment-naïve patients (146 subtype B, 259 *CRF01_AE* and 24 *CRF51_01B* recombinant) were included in the analysis. *CRF51_01B*-infected patients were significantly associated with AIDS (58.33% vs 23.97%, $P = 0.001$) and lower median baseline CD4+ T-cell counts (172 vs 324 cells/mm^3, $P = 0.007$) at presentation when compared with subtype B-infected patients. *CRF51_01B* infection had the highest risk of AIDS at presentation in multivariate analysis (OR 5.64, 95% CI: 1.94-16.40, $P = 0.001$), a trend towards greater rate of CD4+ T-cell decline (104 cells/mm^3, 95% CI: -239 to 30 cells/mm^3, $P = 0.13$) and poorer immunologic response (341 vs 434 cells/mm^3, $P = 0.013$) to treatment when compared with subtype B-infection. *CRF51_01B* and *CRF01_AE* infection were similar in the endpoints.

Discussion & Conclusion:
CRF51_01B infection was associated with higher prevalence of AIDS at presentation, lower median baseline CD4+ T-cell counts and poorer immunologic recovery compared with subtype B, and no difference compared with *CRF01_AE*. Our findings suggest that recombinant genes from *CRF01_AE* are essential in *CRF51_01B* pathogenesis. Immediate ART initiation may not mitigate inter-subtype differences.

BP-CR-03

Clinical, Histopathological and Molecular Analysis of a Retrospective Cohort of Cutaneous B-cell Lymphomas and B-cell Pseudolymphomas in Singapore: A Five-Year Study

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Background & Hypothesis:
This retrospective multi-institutional study aims to determine the clinicopathologic, immunophenotypic and genetic features of patients diagnosed with cutaneous B-cell lymphomas (CBCL) or pseudolymphomas (PL) in Singapore.

Methods:
All patients diagnosed with CBCL or PL from 2007 to 2011 were identified from the records of NSC and the department of histopathology in SGH. In addition to routine histological and immunohistochemical evaluation, FISH was carried out to detect translocations involving BCL2, BCL6, IGH, C-MYC, CCND1, PAX5, MALT1, BCL10 and FOXP1. PCR for IgH heavy chain and/or T-cell receptor gene rearrangements were carried out in equivocal cases.

Results:
A total of 19 cases of CBCL and 10 of PL were included in the study. CBCL presents more frequently with multiple lesions (57% compared to 40% for PL). Histology showed dermal, nodular, follicular or non-follicular lymphocytic infiltrates, with 4 cases showing a diffuse dermal infiltrate. Kappa/lambda light chain restriction were detected in 7/17 cases of CBCL and none of PL. IgH heavy chain and TCR gene rearrangements were detected in 4 cases with CBCL but none with PL. FISH revealed translocations in 3 cases with CBCL (but none with PL): 1 involving BCL2, another involving BCL6 and a third involving both IGH and IGK.

Discussion & Conclusion:
While PCBCL and PL share several similar clinicohistological features, PCBCL tends to present more often than PL with multiple lesions, and light chain restriction is also more frequently observed. In equivocal cases, detection of translocations via FISH or IGH heavy chain or TCR gene rearrangement studies via PCR may be useful in guiding the diagnosis.

BP-HPE-01

Interest, Confidence, Experience, Barriers and Enablers in Research Activities of Allied Health Professionals (AHPs) in a Hospital Setting

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Background & Hypothesis:
Research evidence is essential to support decisions in patient care. It is important to promote research among AHPs to contribute towards the evidence base. This study aimed to explore the interest, confidence, types of research training, level of experience, barriers and enablers for research activities among AHPs.

Methods:
All the AHPs from 9 disciplines (care and counselling, nutrition and dietetics, occupational therapy, physiotherapy, podiatry, prosthetics and orthotics, psychology, respiratory therapy and speech therapy) were invited to participate in an online, self-administered survey. Participants were asked to indicate their interest and confidence in conducting research, rank options pertaining to research training and activities, and select barriers and enablers for research.

Results:
A total of 199 participants completed the survey; 69.7% had received formal research training as part of their professional studies, and 58.8% had been involved in research. The participants rated their interest and confidence in research with mean scores of 6.20 (SD 2.30) and 4.42 (SD 2.14) out of 10, respectively; no difference in scores between those with less than (n = 108), and more than (n = 91) 5 years experience (P >0.01). They indicated least experience in using quantitative and qualitative research methods, and in applying for research funding. Time, research skills training and manpower support were highlighted as the top 3 barriers and enablers for research.

Discussion & Conclusion:
This study highlighted the interest, confidence and experience of AHPs in research, and identified the key enablers for research activities. These findings are pivotal to the formulation of strategies to create a supportive work environment for AHPs to conduct research activities.

BP-HPE-02

An Exploratory Study of the Impact of Informal Curriculum on Junior Doctors Working in a Palliative Care Unit

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Background & Hypothesis:
Learning to care for the dying should extend beyond the formal curriculum, to build the knowledge and humanistic skills to prepare physicians to care for patients in a compassionate and competent manner. Informal education occurs through experiential learning and direct patient contact with guidance from senior physicians. The main objective of this study is to investigate the influence of the informal curriculum on learning experiences of junior doctors rotating through the palliative care department.

Methods:
Seven focus group were conducted with 21 junior doctors who had rotated through the palliative medicine department of a tertiary hospital and inpatient hospice for at least 2 months. Discussions were audio-recorded, transcribed and anonymised. Qualitative content analysis was conducted. NVIVO software was used in the analysis process.

Results:
Junior doctors experience personal growth in both their personal and professional lives. They learnt to confront their own mortality, appreciate the sanctity of life and understood the importance of being supportive and compassionate when caring for the dying. Despite limitations in medicine, they found solace in the process of having a holistic and patient-centred approach in maintaining the personhood of the individual and the important role a physician in empowering patients to live life to the fullest, with symptom minimisation. Doctor-patient interaction skills relating to bedside manners, communication and the ability to empathise with patients' and families' suffering were learnt via role modeling.

Discussion & Conclusion:
Doctors acknowledged that the informal curriculum had a major influence in their personal growth and enhanced their skills in caring for the dying.

BP-HPE-03

Benefits of Teaching Reflection in a Revamped Undergraduate Geriatric Medicine Curriculum

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Background & Hypothesis:
Reflection improves learning, professionalism and clinical reasoning with resultant help in the management of complex patients. This study evaluates the learning outcomes of a revamped undergraduate geriatric curriculum with the teaching of reflection.

Methods:
This is a prospective cohort study of 62 final year medical students rotating through their 3 weeks geriatric medicine posting at Tan Tock Seng Hospital. Rofle's model of reflection was introduced to them at the beginning of their rotation. They were asked to reflect on 3 out of 6 patients seen during their 1-week ambulatory care teaching sessions. Subsequently, they were guided together in a group through 1 of the 3 reflections to consolidate their learning points. A survey was conducted at the end of the rotation to collect feedback.

Results:
Majority of the students surveyed (n = 50 (82.3%)) found the teaching of reflection helpful. This group of students had a higher self-reported attainment of knowledge at the end of the posting compared to the group who did not find reflection useful ($P = 0.01$). They also reported more confidence in performing a geriatric assessment ($P = 0.02$). There was no statistical significant difference in the interest in geriatric medicine between the 2 groups ($P = 0.07$).

Discussion & Conclusion:
Introducing practice of reflection to undergraduate geriatric medicine teaching is helpful in improving geriatric knowledge and increasing confidence in geriatric assessment. However, our study doesn't find that the practice of reflection increases interest in geriatric medicine. Further research can be done to evaluate the benefits of this revamped undergraduate geriatric curriculum.

BP-HSR-01

Efficacy, Tolerability and Cost-Effectiveness of Long-Term Antipsychotic Treatment in Schizophrenia

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Background & Hypothesis:
Given the multitude of pharmacological treatments available at different costs for the long-term management of schizophrenia, we sought to answer the question of which antipsychotic offers the best value for money taking into consideration their efficacy in relapse prevention, tolerability and incurred costs.

Methods:
A network meta-analysis was conducted to determine the relative efficacy and tolerability of 11 oral antipsychotics (amisulpride, aripiprazole, chlorpromazine, haloperidol, olanzapine, paliperidone, quetiapine, risperidone, sulpiride, trifluoperazine and ziprasidone). The clinical estimates were applied in a Markov model in order to estimate lifetime costs and quality-adjusted life-years (QALYs) gained. Quality of life data were obtained from published literature and costs from hospital databases in Singapore.

Results:
The most favourable pharmacological treatment in terms of relapse prevention was olanzapine with an annual probability of relapse of 0.24 (0.13-0.38), with placebo as reference of 0.75 (0.73-0.78). Olanzapine was most well tolerated with the lowest probability of withdrawal of 0.09 (0.04-0.20), despite being associated with more weight gain compared with other agents. At an annual acquisition cost of SGD 219 (generic olanzapine), it was cost-effective in terms of highest QALYs gained per patient and having a lower total cost than all other comparators from a payer's perspective. Key drivers of cost-effectiveness were probability and cost of relapse, as determined from one-way sensitivity analyses.

Discussion & Conclusion:
Of the investigated oral antipsychotics, olanzapine was the most cost-effective treatment in Singapore healthcare setting over lifetime horizon. These evidence-based findings serve to inform the clinician's selection of long-term antipsychotic treatment in clinical practice.

BP-HSR-02

A New Music Therapy Engagement Scale (MTED) for People with Dementia in a Music Therapy (MT) Programme

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Background & Hypothesis:
To date, there are few validated instruments to assess how people with dementia (PWD) respond to music therapy (MT). We describe the development of a new instrument, MTED, and evaluate its psychometric properties.

Methods:
PWD attended a Nordoff-Robbins-Creative MT programme in a tertiary hospital. Drawing from extant literature and from qualitative responses of PWD during MT over 2 years, the initial items of MTED describing the ways PWD engaged in MT (musical, verbal and emotional) were derived. MTED was trialled and refined further before it was finalised and subjected to psychometric testing.

Results:
Two music therapists, a nurse clinician, psychologist and geriatrician established content validity of MTED, resulting in a 5-item version rated on a 4-level Likert scale. Sixty-two PWD (MMSE = 13/30, age = 83.2 + 7.66) involved in 120 MT-sessions were assessed with MTED. Reliability of MTED by internal consistency (Cronbach alpha) was 0.87 and inter-rater reliability was 0.96. MTED correlated strongly with the combined items "Pleasure, Interest, Sadness, Affect and Sustained Attention" of The Greater Cincinnati Well-being Tool (r = 0.87, *P* <0.01), "Communication" domain of Holden Communication Scale (r = 0.79, *P* <0.01) and "Active" domain of Participant Engagement Observation MT Checklist (r = 0.79, *P* <0.01). Exploratory factor analysis revealed a 2-factor structure for MTED, namely "music-related" and "socio-emotional" factors.

Discussion & Conclusion:
MTED demonstrated excellent psychometric properties to measure engagement in PWD during MT. To our knowledge, this is the first scale of its kind. The format of a brief 5-item measure with descriptives makes for easy administration and holds much promise for use in both service and research settings.

BP-HSR-03

Development of a Prognostic Prediction Model for Progression of Prediabetes to Type 2 Diabetes Mellitus

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Background & Hypothesis:
The study aimed to develop a prognostic prediction model to predict absolute risks of developing diabetes in patients with newly onset prediabetes over a period of 7 years.

Methods:
A retrospective cohort study using a chronic disease registry to estimate the 7-year risk of diabetes in a cohort aged 21+ years with newly onset prediabetes. About 75% of the data were randomly allocated to derivation dataset for model development and the remaining 25% to validation dataset for model validation. Four Cox Proportional Hazards models were developed using different methodologies; and patients with different predicted risks were stratified into 3 acuity categories. Prediction accuracy of the models was assessed using objective measurements of discrimination and calibration, complemented with graphical visualisation to aid selection of the best model for risk prediction.

Results:
About 2608 patients with prediabetes contributed 9506 person-years with 13.7% of them developed diabetes during the follow-up period, yielding an incidence rate of 37.5 per 1000 person-years with a mean follow-up time of 3.6 ± 1.6 years. The full model that applied multivariable fractional polynomials algorithms without the variable with high proportion of missing values was selected as the best model. The final model attained good discrimination and calibration. Approximately 57.8% of patients were identified with low risk of diabetes development; 16.9% with medium risk and 25.3% with high risk.

Discussion & Conclusion:
The model could be used to identify patients at different risks of diabetes development who might benefit from tailored interventions with varying intensity.

BP-NR-01

Working in a Dementia Unit is Associated with Enhanced Person Centredness of Care

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Background & Hypothesis:
Person centred care (PCC) is synonymous with high quality healthcare today, particularly for frail seniors with dementia (SWD). Staff working with SWD hone skills in PCC through on-the-job exposure and regular case discussions on how to provide better care. We evaluated nurses' knowledge, attitude and execution of PCC between those working in a dementia unit (DU) versus a conventional ward (non-DU).

Methods:
Seventy-one nurses (13 DU, 58 non-DU) from a tertiary hospital were recruited. The Tool for Understanding Residents' Needs as Individual Persons (TURNIP) was used to examine the nurses' understanding, attitude and execution of PCC. TURNIP comprises 39-items which tap into 5 domains of PCC. Analysis of variance compared DU and non-DU nurses' responses, including other variables, on TURNIP.

Results:
A significant difference ($t(58) = 4.02$, $P <0.001$) was observed in mean total TURNIP scores between DU ($150.64 + 12.42$) and non-DU nurses ($134.02 + 12.31$), with higher scores reflecting greater person centredness. On all 5 domains, DU nurses scored higher than non-DU nurses: "Environment" ($28.54 + 3.53$ versus $25.52 + 4.37$; $t(63) = 2.31$, $P <0.05$), "Attitude" ($33.83 + 3.59$ versus $31.27 + 3.60$; $t = 2.24$, $df = 65$, $P <0.05$), "Knowledge" ($16.85 + 3.05$ versus $15.32 + 2.28$; $t = 2.05$, $df = 68$, $P <0.05$), "Organisation" ($34.67 + 3.93$ versus $31.06 + 4.52$; $t(64) = 2.60$, $P <0.05$), and "Content" ($35.08 + 2.72$ versus $31.44 + 4.35$; $t(66) = 2.88$, $P = 0.01$). Nurses with higher education (degree versus non-degree) were also observed to score better only on the "Knowledge" domain ($16.71 + 2.20$ versus $14.54 + 2.34$; $t(67) = 3.95$, $P <0.01$).

Discussion & Conclusion:
Working in a DU is associated with enhanced knowledge, attitude and execution of PCC. Both on-the-job exposure and case discussions likely contributed to the outcomes. Exposing nurses to caring for SWD in dementia units can have a positive impact on enhancing attitudes and skills in PCC.

BP-NR-02

Evaluating the Effectiveness of an e-Learning Module for Registered Nurses

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Background & Hypothesis:
Registered nurses care for many complex patients in a general hospital including those developing alcohol withdrawals (AW). Delirium tremens, a severe form of AW, if untreated, can lead to mortality. Often, knowledge and assessment skill gaps exist in assessment of alcohol-related problems.

Methods:
The Department of Psychological Medicine created an e-Learning module to target identified knowledge gaps that encompass theoretical knowledge of alcohol withdrawal (pathophysiology, identification, investigations, management and monitoring of patients), and showcased the skills component by using Clinical Institute of Withdrawal Assessment-Alcohol scale (CIWA-Ar) in the videos with each progression of AW demonstrated. Pre- and post-test scores were obtained in the form of 10 multiple choice questions (MCQ) and assessing severity of AW based on a series of videos using CIWA-Ar charting.

Results:
A total of 91 registered nurses completed both the pre- and post-test MCQs. There was an improvement of 56% (n = 51) in the pre- and post-MCQs scores. Sixty-five registered nurses completed the pre- and post-test assessments for assessing severity of AW using CIWA-Ar charting. A majority (n = 49, 75%) scored the severity of AW correctly during the pre-test assessment and 56 (86%) for the post-test assessment. Out of 16 nurses who failed the pre-test assessments, 87.5% (n = 14) showed improvement in the post-test.

Discussion & Conclusion:
The preliminary findings revealed the positive use of the use of e-Learning module which had been effective in bridging the knowledge gaps for registered nurses. This module is also effective in enhancing nurses' assessment skills.

BP-NR-03

"When Can I Be Free from My Miserable Leg?" A Qualitative Study of Patients' Experience of Chronic Leg Ulceration in Primary Healthcare in Singapore

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Background & Hypothesis:
Chronic leg ulceration significantly reduces quality of life. The challenge for health professionals is to maintain the effectiveness of interventions, enhance compliance rates and prevent recurrence. There is knowledge from overseas but what are the experiences of Singapore patients with chronic leg ulceration?

Methods:
A qualitative design including semi-structured, optionally audio and/or video-recorded, in-depth interviews with 8 participants in the primary healthcare setting chosen to provide maximum variation of demographic background and ulcer experience. Interviews, lasting up to 60 minutes, were transcribed verbatim, coded according to issues identified by the participants and analysed thematically. Ethic approval was obtained from La Trobe University, Australia and the National Healthcare Group (NHG) Domain Specific Review Board (DSRB), Singapore.

Results:
Four interlinked themes were identified: physical impact (pain, discomfort, inconvenience); psychosocial well-being (embarrassment, loss of self-esteem, frustration, and depression); family consequences (lack of support, self-blame) and concerns about ulcer progression (unpredictable healing, hope).

Discussion & Conclusion:
For the participants, pain was the main concern that "drives me crazy", suggesting that their pain was not well managed. It resulted in significant psychosocial issues (including suicidal intent) and other consequences (e.g. relationship issues), of which health professionals might not be aware of, that led to ulcer recurrence. Prompt access to advice, treatment and holistic care by multidisciplinary teams in the event of accidental trauma, skin changes or breakdown could lead to a more positive outlook and improved outcomes. Further research on factors specific to Singapore, such as climate and family culture, is recommended.

HPE-RI-01

Barriers to Clinical Nurses Adopting Evidence-based Practice

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Background & Hypothesis:
Clinical nurses have consistently reported that it is difficult to engage in evidence-based practice (EBP). As the participating hospital moves towards the goal of a magnet-designated institution, greater emphasis needs to be focused on EBP. The aim of this study is to identify barriers to EBP among nurses to develop strategies for overcoming them.

Methods:
This was a cross-sectional survey. We recruited a convenient sample of 230 registered nurses working in the participating hospital. We used the BARRIERS scale (29 items) to identify nurses' perceptions of barriers to EBP. Respondents rated the perceived extent each item was a barrier to EBP on a 4-point scale (no extent to great extent). A "no opinion" was also allowed. We used Excel to generate the descriptive statistics.

Results:
The response rate was 94%. Missing data were minimal. The main perceived barriers to EBP were related to the BARRIERS domain of organisational characteristics. These were: not having the time to read research, insufficient time on the job to implement new ideas, not feeling he/she has enough authority to change patient care procedures, results not generalisable to own setting, and physicians will not cooperate with implementation.

Discussion & Conclusion:
The finding that the main barriers to EBP for local nurses pertained to perceived organisational constraints is consistent with reported studies. To facilitate a paradigm shift towards a culture that promotes EBP, more insights is required. We planned to follow up with a qualitative study to explore nurses' views on the aspects of organisation which hinder EBP.

HPE-RI-02

The Effectiveness of an Interprofessional Induction Programme on the Perception of Interprofessional Collaboration among New Staff at a Tertiary Rehabilitation Centre

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Background & Hypothesis:
According to Lingard et al (2002), they emphasised that interprofessional collaboration (IPC) practice as cultivated by interprofessional education (IPE) does form the nucleus of both patient-centric care. Few of these studies exist. The aim of the study was to explore the effects of new staff perception on IPC through an interprofessional induction programme in a rehabilitation centre.

Methods:
Two half-day sessions on WHO competencies for IPC were facilitated. They encompassed values and ethnics, roles and responsibilities, communication, conflict management and team functioning that were built into the E-Blackboard Learning Management System. The instruments used are Attitude Towards Health Care Teams Scale (ATHCT), Team Skills Test and Team Fitness Tool. The instruments were administered before and after the induction programme.

Results:
Eight physicians, 7 nurses, 8 physiotherapists and 1 occupational therapist participated in the study. For staff without any prior IPC experience, their mean ATHCT score of 90.67 (SD = 8.44) preprogramme increased to 94.61 (SD = 11.44) postprogramme with Wilcoxon Signed Ranks Test revealing a statistical significant of $P = 0.024$. For staff with prior working experience, they achieved mean ATHCT score from 93.19 (SD = 9.4) to 97 (SD = 8.43) also revealing a statistical significance of ($P = 0.036$). Besides, their mean Team Fitness Tool score had also increased from 76.29 (SD 12.16) to 82.08 (SD 10.43) postprogramme, with a corresponding revealed change that was statistically significant ($P = 0.024$).

Discussion & Conclusion:
The study has shown positive impact on influencing staff perception towards IPC. However, in order for interprofessional collaboration to be transferable, it is essential to practise those competencies in the real clinical setting.

HPE-RI-03

Exploring the Collaboration Experiences of Junior Doctors and Nurses in the General Wards Setting in Singapore: A Qualitative Study

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Background & Hypothesis:
Collaboration between doctors and nurses are vital to building an integrated healthcare system, the heart from which well coordinated quality care is delivered to patients. Ineffective doctor-nurse collaboration not only compromises the quality of patient care but also causes work dissatisfaction among doctors and nurses. This study's objectives are therefore: 1) to explore collaboration experiences of junior doctors and nurses, and 2) identify strategies that can improve collaboration.

Methods:
A qualitative descriptive study was conducted. Eleven junior doctors and 8 junior nurses with 6 months to 3 years of working experience in the general wards participated. Semi-structured interviews were conducted to collect data. The interviews were audio-recorded and transcribed. Inductive content analysis was used.

Results:
Four major themes emerged: working towards better patient care, struggling to cope, interpersonal relationships, and nurses to step up. While working collaboratively, junior doctors and nurses experienced a lack of open and clear communication. They struggled to cope with heavy clinical workloads and found it difficult to establish positive interpersonal relationships, due to traditional stereotypes of medical dominance and nursing subservience.

Discussion & Conclusion:
The findings identified challenges that junior doctors and nurses faced during collaboration. The study recommended providing more tools and opportunities to help doctors and nurses communicate clearly and effectively, engaging doctors and nurses in interprofessional education programmes, for them to develop a greater understanding of the other profession's contributions to patient care. More nurses should also undertake higher nursing education and be empowered with clinical decision-making skills, knowledge and confidence to better communicate with doctors.

SG-AH-01

Does Kinesiology Taping Improve the Early Postoperative Outcomes in Anterior Cruciate Ligament Reconstruction? A Randomised Controlled Study

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Background & Hypothesis:
Kinesiology taping had been proposed and applied clinically with the aim to improve patient's outcome and achieving rehabilitation goals. It had been used in the management of postmastectomy lymphoedema, and postoperative swelling in total knee replacement and limb lengthening procedures with use of the Ilizarov method. The efficacy of kinesiology taping in arthroscopic knee surgery had not been reported.

Methods:
This randomised controlled study involved 60 subjects who underwent an elective anterior cruciate ligament reconstruction and standardised postoperative physiotherapy rehabilitation. After recruitment, subjects were randomised into intervention and control groups. Both groups underwent standardised physiotherapy rehabilitation by experienced physiotherapists. In addition, the intervention group received Kinesiology taping. The study parameters include self-reported knee pain intensity, joint swelling, self-reported knee function and knee range of motion. Kinesiology taping of the operated knee was performed at first and second week postsurgery. Measurements were taken preoperative, first, second and sixth week postsurgery.

Results:
Thirty subjects were recruited in each group. Statistically significant differences were found in all study parameters in both groups. When inter-group comparisons were made, a statistically significant difference was found for the parameter of pain intensity between the 1st and 2nd weeks after surgery ($P = 0.0164$). No other statistically significant differences were found in other knee parameters between groups.

Discussion & Conclusion:
Our study showed that Kinesiology taping helps to reduce self-reported knee pain in the early postoperative period of arthroscopic anterior cruciate ligament reconstruction.

SG-AH-02

Qualitative Improvement Programme to Prevent Hospital-Acquired Pneumonia in Patients with Colorectal Surgery

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Background & Hypothesis:
Evidence has shown that postoperative pneumonia prevention programmes are effective in preventing hospital-acquired pneumonia (HAP). However, there is a lack of application of this programme in the local hospital setting. A qualitative improvement project was designed to identify the barriers and facilitate the translation of research knowledge into current practice.

Methods:
A HAP Prevention Bundle (HAPPB) was implemented to minimise postoperative HAP incidence in patients with colorectal surgery. This programme consisted of 4 components (i.e. oral hygiene twice daily; head-of-bed elevation ≥30°; incentive spirometer 80 times daily; and sit out of bed twice daily). The key reasons for poor compliance to HAPPB were inadequate staff training, poor programme awareness, and lack of preoperative patient education. Three interventions were implemented to address these barriers. These included nursing staff training on the importance of incentive spirometer and early mobilisation, HAPPB form implementation to facilitate team awareness, and outpatient preoperative education sessions.

Results:
The compliance rate of HAPPB across all 4 components increased from 0% pre-intervention (February-May 2014) to 89% (173/194) post-intervention (February-May 2015). The HAP rate decreased from 8% (5/60) pre-intervention to 0% (0/44) post-intervention. There was a reduction in length of stay (2.8 days) and healthcare cost ($2800 per day).

Discussion & Conclusion:
Preoperative education and training were crucial in ensuring that both patients and staff had a clear understanding of the HAPPB benefits, leading to greater involvement and compliance to this programme. An increased compliance rate of HAPPB led to a decreased rate of HAP, reduced length of stay and healthcare cost.

SG-AH-03

Frailty in Singapore Elderly: Prevalence, Correlates and Role in Disability and Service Use in a Nationally Representative Sample

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Background & Hypothesis:
Frailty, a state of increased vulnerability resulting from decline in reserve and function across multiple physiological systems, is a strong predictor of adverse outcomes in elderly including falls, disabilities, institutionalisation, and mortality. This study examined the prevalence of frailty and its association with socio-demographic, medical and social characteristics, disability and service utilisation is a representative sample of elderly Singaporeans.

Methods:
Cross-sectional data from a national survey of 2565 elderly participants aged 60 years and above were analysed. Frailty was assessed as the presence of 3 out of 5 Fried's frailty criteria (weight loss, exhaustion, low physical activity, low grip strength and slow gait speed). Upon testing bivariate associations, backwards step-wise logistic regression analysis was conducted to identify the strongest correlates of frailty.

Results:
Prevalence of frailty was 7.2% (95% CI: 6.0-8.7%), which significantly increased with age (5.2% in 60-74 year olds to 22.9% in those aged above 84 years). Frailty was significantly associated with several socio-demographic and health characteristics, as well as caregivers' psychological morbidity. Dementia, diabetes, cardiovascular problems and cancer diagnoses and care needs were significantly related to frailty in the final regression model. Frail elderly also had significantly greater disability and higher service utilisation including visits to outpatient clinics, allied health professionals, emergency rooms, hospitalisations and respite/nursing home stays.

Discussion & Conclusion:
Frailty is common among the elderly and it correlates with many components at the person, health and societal levels, thus highlighting the importance of individual and population-level frailty detection and intervention strategies targeting this population.

SG-CIA-01

Nasal Methicillin-Resistant *Staphylococcus Aureus*: A Potential Source for Nosocomial Transmission in Hospitals and Intermediate- and Long-Term Care Facilities (ILTCs)?

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Background & Hypothesis:
Nasal carriage of methicillin-resistant *Staphylococcus aureus* (MRSA) could be a source for nosocomial transmission, but it is not well studied. We compared the prevalence of MRSA colonisation in the nares and skin, and assessed for factors associated with colonisation.

Methods:
We conducted a cross-sectional study in Tan Tock Seng Hospital and affiliated IILTCs, from 2 June-9 July 2014. Randomly selected patients with >48 hours stay in acute hospital and all ILTC patients were included. Nasal, axillary, and groin swabs were separately cultured for MRSA, and clinical data obtained from medical records. To control for confounding, multivariable logistic regression models were constructed.

Results:
A total of 1700 patients were screened. MRSA prevalence in intermediate-care facilities (ICF) (29.9%) and long-term care facilities (20.4%) were higher than in acute hospital (11.7%) (*P* <0.0001). Half (53.8%) of MRSA-colonised patients had nasal carriage. On multivariable analysis, being male (OR 1.64, 95% CI 1.25-2.15, *P* = 0.0003), length of stay (LOS) >7 days (OR 3.05, 95% CI 2.00-4.65, *P* <0.0001), and being a resident of ICF (OR 2.54, 95% CI 1.86-3.46, *P* <0.0001), were positively associated with MRSA colonisation. Among MRSA-colonisers, gender was the only factor independently associated with nasal colonisation of MRSA (female vs male, OR 2.27, 95% CI 1.39-3.85, *P* = 0.0014), after controlling for age, LOS, and healthcare facility type.

Discussion & Conclusion:
MRSA prevalence in ILTCs is significantly higher than in the acute hospital. Females are twice as likely to be nasally colonised. Infection prevention strategies in acute hospitals should be extended to ILTCs, and interventions should include nasal decolonisation.

SG-CIA-02

The Haptoglobin 2-2 Genotype is Associated with Inflammation, Oxidative Stress and Carotid Artery Intima Media Thickness

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Background & Hypothesis:
Haptoglobin (Hp) is an acute phase antioxidant that binds circulating haemoglobin. In humans, Hp is characterised by a genetic polymorphism resulting in 3 genotypes *Hp1-1*, *Hp1-2* and *Hp2-2*. The *Hp2-2* genotype has been associated with atherosclerosis in type 2 diabetes mellitus (T2DM). We hypothesised that the *Hp2-2* genotype is associated with the inflammatory marker hsCRP, oxidative-stress and carotid-artery intima-media thickness (CIMT) in our population.

Methods:
Subject characteristics: n = 160, 120 T2DM without cardiovascular complications, 40 healthy; 79 Chinese, 81 Indians. Measurements: Hp genotype using TaqMan-based RT-PCR; hsCRP; oxidative stress: Hp concentrations, oxidative stress index (OSI); metabolic profile: HbA1c, glucose and lipids; CIMT using ultrasound (Mannheim CIMT consensus). The association between Hp genotypes and Hp, OSI, hsCRP and CIMT, adjusting for HbA1c, lipid panel, blood pressure, age, gender, ethnicity, fasting glucose, BMI and smoking status was analysed by a logistic multivariable regression model using SPSS version 22.

Results:
The prevalence of *Hp2-2* genotype was 58% (92/160) and higher in Indians (70%) compared to Chinese (44%); *P* = 0.001. Multivariate analysis showed that the *Hp2-2* genotype was associated with a higher hsCRP (mean: 3.6 ± 3.9 mg/L versus 2.2 ± 2.7 mg/L (non-*Hp2-2*); *P* <0.001), lower Hp concentration (mean: 119.0 ± 56.0 mg/dL versus 155.3 ± 56.7 mg/dL (non-*Hp2-2*); *P* <0.001) and higher average CIMT (CIMT: 0.61 ± 0.12 mm versus 0.59 ± 0.12 mm (non-*Hp2-2*); *P* = 0.029).

Discussion & Conclusion:
This pilot study suggests that *Hp2-2* genotype is positively correlated to hsCRP and carotid atherosclerosis while inversely correlated to antioxidant Hp in our population. Large scale studies assessing this association with other vascular complications are needed to confirm these findings.

SG-CIA-03

A Combined Cognitive Stimulation and Physical Exercise Programme (MINDVital) in Early Dementia: Differential Effects on Single- and Dual-Task Gait Performance

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Background & Hypothesis:
Gait disorders are common in early dementia, with particularly pronounced dual-task deficits, contributing to the increased falls risk and mobility decline associated with cognitive impairment. This study examines the effects of a combined cognitive stimulation and physical exercise programme (MINDVital) on gait performance under dual-task conditions in older adults with mild dementia.

Methods:
A total of 39 patients with early dementia participated in a multidisciplinary rehabilitation programme comprising both physical exercise and cognitive stimulation. The programme was conducted in 8-week cycles with participants attending once weekly, and all participants completed 2 successive cycles. Cognitive, functional performance and behavioural symptoms were assessed at baseline and at the end of each 8-week cycle. Gait speed was examined under both single (timed-up-go and 6-metre walk) and dual-task (animal category and serial counting) conditions. Repeated measures analyses were performed using random effects models.

Results:
The mean age of patients enrolled in the rehabilitation programme was 79 (6.2) years, and 25 (64.1%) had a diagnosis of Alzheimer's dementia. There was a significant improvement in cognitive performance [coefficient (SE) = 0.92 (0.31), $P = 0.003$] and gait speed under both dual-task situations [animal category: coefficient (SE) = 0.04 (0.02), $P = 0.037$; serial counting: coefficient (SE) = 0.05 (0.02), $P = 0.011$], with reduced dual-task cost for gait speed [serial counting: coefficient (SE) = -4.54 (2.36), $P = 0.054$] following successive MINDVital cycles. No significant improvement in single-task gait speed was observed.

Discussion & Conclusion:
A combined physical and cognitive rehabilitation programme leads to significant improvements in dual-task walking in early dementia, potentially mediated by improved cognitive performance as single-task gait performance remained stable.

SG-CIA-04

Three-Dimensional Automated Segmentation of Skin Layers in In Vivo High Definition Optical Coherence Tomography: Redefining the Pathology of Miliaria Profunda and Provision of a Novel Treatment

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Background & Hypothesis:
The high definition optical coherence tomography (HD-OCT) is a recently developed non-invasive imaging modality for the skin. Miliaria profunda (MP) is an uncommon and potentially fatal dermatosis in which blockage of sweat ducts inhibit sweating.

Methods:
We developed a novel software algorithm to automatically segment the skin in HD-OCT images into the epidermal and dermal layers in a 3-dimensional manner. To evaluate its accuracy, the tool was applied to 5 image volumes from 5 normal individuals (512 images in each volume/individual) and compared to the standard laborious method of manually marking out the layers.

Results:
The epidermal thicknesses determined from both computerised and manual methods were closely similar. The tool was subsequently applied to the HD-OCT images of 5 patients with MP. The lesions of MP were found to be limited to the epidermis with the location of obstruction occurring at the sweat orifice, contrary to current belief. To replicate obstruction of the sweat orifices, aluminium chloride was applied to the skin of a healthy volunteer—lesions identical to that in MP were visualised in HD-OCT. A novel treatment using isotretinoin to unblock the keratinaceous obstruction at the sweat orifice was provided for 2 patients, resulting in resolution of their diseases.

Discussion & Conclusion:
We developed a software algorithm to automatically segment the layers of the skin in a 3-dimensional manner in HD-OCT images. This tool can aid in the diagnosis and study skin diseases, as exemplified by MP, in which we managed to redefine the understanding of the pathology and provide a novel treatment for the disease.

SG-CIA-05

Bringing Therapy to the Patient. A Study on the Efficacy, Compliance and Cost-Effectiveness of Home-based Phototherapy as Opposed to Institution-based Phototherapy for the Treatment of Patients with Focal Vitiligo

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Background & Hypothesis:
Vitiligo is a disease with loss of melanin pigments and functioning melanocytes. Phototherapy is the treatment of choice but it is time consuming as it is institution-based currently. Home-based phototherapy has been used for the treatment of psoriasis but till date, there has been no studies done to determine its effectiveness for treatment of localised vitiligo. The aim of the study was to compare the efficacy, compliance and cost-effectiveness of home-based versus institution-based phototherapy in patients with focal vitiligo vulgaris.

Methods:
Randomised controlled trial where patients were randomised into 2 groups; one using home phototherapy while the other underwent institution-based phototherapy for 6 months. All patients were assessed at recruitment and subsequently after every 12 weeks. At the end of the study, the percentage of repigmentation, compliance rates and cost of each treatment modalities were compared.

Results:
A total of 44 patients were recruited. Both treatment arms produced significant improvement in patients with no statistical difference between the 2 groups at 6 months of treatment. The compliance rates in the institution-based group was much lower with only 70% of patients compliant with treatment protocol as opposed to 92% of patients from the home-based group. The total cost of institution-based treatment over 6 months was close to $13,000, excluding consultations, while those in the home-based group spent about $1000, thus resulting in a cost saving of $12,000 per patient.

Discussion & Conclusion:
Home-based phototherapy is a more convenient and cost-effective treatment option, as compared to institution-based phototherapy, in a carefully selected group of patients with focal vitiligo.

SG-NA-01

Self-Care Participation of the Hospitalised Elderly – Nurses' Perceptions of Facilitators and Barriers

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Background & Hypothesis:
Elderly patient's participation in their own self-care can delay functional decline and promote early discharge. Yet, elderly patients often spend the majority of their time in bed with nurses providing care for the patients rather than with them. This study examined nurses' perceptions of facilitators and barriers toward hospitalised elderly patients' self-care participation.

Methods:
We used a qualitative descriptive research design. We recruited a convenience sample of nurses with at least 6 months of ward working experience. We included registered nurses and enrolled nurses from diverse settings. Following a pilot study, we conducted 6 focused group interviews and achieved data saturation. The same facilitator conducted all focus groups to ensure consistency. The interviews were audiotaped, transcribed verbatim and coded into categories. We analysed transcribed data using thematic analysis.

Results:
Nurses' perceived facilitators to elderly patients' self-care participation included mutual goal setting, gradual increment of self-care, interprofessional collaboration, family and domestic helpers' involvements and nurses' encouragements. Perceived barriers included patients' medical conditions, patients taking on the "sick role", patients' and their families' expectations as "paid for care", language barrier, nurses' belief system, heavy workload, tight staffing and ward practices.

Discussion & Conclusion:
Many of the nurses' perceived facilitators and barriers of self-care participation concur with Western findings. The study also revealed insightful findings specific to the local Singaporean setting. The findings have important clinical implications in informing practice on strategies to optimise elderly patients' participation in their self-care, enhancing their functional recovery and hastening discharge.

SG-NA-02

Is There a Significant Difference in Reported Anxiety among Patients' Relatives who Received Intraoperative Progress Information by Short Message Service (SMS) Communication and Those Who Do Not?

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Background & Hypothesis:
Intraoperative periodical update for patient relatives or accompaniers is currently unavailable in Singapore hospitals. This research investigates the relationship between the provision of intraoperative periodical updates and patient relatives' or accompaniers' anxiety and satisfaction levels for same-day admitted patients undergoing surgery for 2 and a half hours or more in Tan Tock Seng Hospital. Hypothesis: Providing intraoperative information will reduce anxiety and provide greater satisfaction for patients' relatives or accompaniers.

Methods:
A total of 146 patients' relatives or accompaniers were recruited randomly into control and intervention groups. Periodical messages on intraoperative updates were sent via SMS to intervention group participants only. The preoperative and postoperative anxiety levels for all participants were assessed using State-Trait Anxiety Inventory. Satisfaction level was assessed using Likert scale. Statistical analyses to interpret anxiety and satisfaction levels between both groups were performed using Stata Version 13.

Results:
Females have statistically significant higher preoperative and postoperative anxiety score than males. A statistically significant association between correlated post and pre anxiety score and research group is noted. Those in the intervention group are more likely to have a significant decrease for postoperative anxiety score compared to their preoperative anxiety score ($P = 0.022$) and higher satisfaction level ($P < 0.001$); 98.63% of participants preferred receiving intraoperative updates as the standard of care.

Discussion & Conclusion:
The provision of intraoperative updates which alleviated anxiety and increased patient relatives' or accompaniers' satisfaction levels during the perioperative experience is preferred. Results are congruent to similar studies done overseas. Further research is required to affirm its impact.

SG-NA-03

Mental Health Recovery – Correlates and Perception from Patients and Clinicians

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Background & Hypothesis:
The notion of mental health recovery has been a topic of interest and debate. Though personal experiences of recovery have been explored extensively in the literature, few studies have examined clinicians' perspectives. This study aims to explore the relationships between patients' and clinicians' perception of mental health recovery.

Methods:
A total of 100 outpatients with serious mental illnesses participated in a cross-sectional, descriptive study. They completed the Mental Health Recovery Measure (MHRM), General Self-Efficacy Scale (GSE) and Drug Attitude Inventory-10 (DAI) which measure their personal experiences of recovery and attitudes towards medications. Clinicians' ratings were measured using the Brief Psychiatric Rating Scale (BPRS).

Results:
Most patients were Chinese (87%), single (60%), females (55%) and diagnosed with schizophrenia (83.9%). Even after controlling for their socio-demographic characteristics, patients reported recovery from mental illnesses (MHRM M = 94.43, SD = 12.53 on a scale of 0 to 120) and high self-efficacy (GSE M = 31.4, SD = 5.79 on a scale of 1 to 40). They had positive attitudes towards medication (DAI M = 7.26, SD = 2.42 on a scale of 1 to 10). Clinicians considered patients' psychiatric symptoms to be well managed (BPRS M = 24.71, SD = 1.18 with possible scores ranging from 24 to 168). BPRS was unrelated to MHRM, GSE or DAI. Only GSE was correlated with MHRM, r(98) = 0.70, *P* ≤0.001.

Discussion & Conclusion:
Findings suggested that patients' perception of recovery was not synonymous with their attitudes towards medication or clinicians' ratings of their symptoms. Hence, clinicians' and patients' perception should not be used interchangeably to assess patients' recovery.

SGPCR-O-01

Discovery Learning Gaps for a Nursing Leadership Programme in a Primary Care Setting

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Background & Hypothesis:
A needs assessment was conducted to determine the learning gaps for a nursing leadership training programme.

Methods:
A 121-item, 6-Likert scale survey questionnaire containing 7 domains of leadership competencies was administered online in November 2014. The survey questionnaire was developed on the basis of both a validated nursing leadership competency framework and the author's own institutional generic leadership competency framework. The face and construct validity and internal consistency reliability were tested (a = 0.98). The questionnaire was completed by 36 out of 40 nurse leaders recruited (n = 36).

Results:
Descriptive statistical methods were used in analysing the data in order to determine whether any training is needed, the areas in which training is needed, the gap(s) to be bridged and the desired training outcomes. Three out of 7 domains (finance management, systems thinking and think strategically) scored below 6 (unsatisfactory). The top 20 item-specific deficiencies were identified, of which 12 items fall under the 3 unsatisfactory domains. There was no significant correlation between learning gaps and years of experience working in the organisation ($P > 0.05$). However, it was correlated between learning gaps and years at a managerial position ($P < 0.05$).

Discussion & Conclusion:
The focus of the leadership programme would be bridging the gaps identified in the 3 unsatisfactory domains and the top 20 deficiencies, with consideration of customisation based on years of leadership experience. The limitation of this study lies in the small sample size which weakened the generalisability of the study.

SGPCR-O-02

Improving Care of Empaneled patients through a Team-based Approach in the Polyclinic–Outcomes at 6 Months

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Background & Hypothesis:
Healthcare costs, fragmented care and multimorbidity have prompted health systems to seek a more sustainable approach to chronic disease management of patients in primary care. We aimed to transform primary care through team-based care of patients enrolled to a team in a polyclinic over a 3-year period.

Methods:
Language-matched patients with any chronic disease requiring follow-up were enrolled into a team comprising of 3 doctors, 2 care managers and 2 care coordinators. The team was colocated and preconsultation screening was performed to identify preventive health and care needs. Clinical, operational and patient-related outcomes were measured before and 6 months after the start of the pilot.

Results:
Data from 4762 patients who had been enrolled for more than 6 months were analysed. The mean age was 68.7 years and the mean comorbidity count was 2.97. Pap smear uptake increased 1400% over a 6-month period. There was an improvement in the proportion of patients with LDL-cholesterol levels less than 2.6 mmol/L from 54.6% to 57.0% ($P <0.05$). There was no statistically significant difference in blood pressure and HbA1c levels after the 6-month period. Patient satisfaction scores increased by 14.5% ($P <0.05$) and patient empowerment index increased by 18.6% ($P <0.05$). There was a 16% reduction in doctor visits for chronic diseases.

Discussion & Conclusion:
A team-based approach to patient care increases patient satisfaction and empowerment, while reducing the number of doctor visits for chronic problems with improved LDL-cholesterol levels. Further data is awaited as the pilot evolves over the next 3 years to see if further benefits occur.

SGPCR-O-03

Resilience in Drug Addiction

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Background & Hypothesis:
Research on resilience factors in drug addiction has been widely conducted. However, studies on the process, which explains how drug addicts overcome addiction and maintain abstinence through interaction of resilience factors, have been scarce. This study is a preliminary exploration on the recovery process in drug addiction guided by Bronfenbrenner's (1986) ecological contextual theory of human development.

Methods:
Qualitative design using multiple case study approach was utilised whereby data triangulation and semi-structured interviews were conducted. Two cases were examined via data triangulation, in which 2 recovering substance abusers, caregivers of the respective individuals, and 1 experienced counsellor in drug addiction were interviewed. Two other relapse cases were included as rival condition to address internal validity.

Results:
Pattern matching found resilience themes in the individuals at microsystem, macrosystem, and chronosystem levels. The empirical data indicated that personal reflection on life and witnessing successful cases contributed to intrinsic motivation to overcome addiction. A provisional model of recovery process was proposed via explanation building. Emotional support, spiritual support, rules for relapse prevention, and structured and constructive activities in rehabilitation programmes are essential for recovering process and abstinence. This strengthens the sense of love and belongingness, sense of spiritual support, awareness of relapse risk and active engagement in meaningful activities.

Discussion & Conclusion:
The present finding suggests a preliminary direction for working with substance abuse patients in primary care, in which resilience factors could be elicited and activated prior to specialist care.

SGPCR-P-01

Perceptions of Adolescents in Asia towards People with Mental Illness: A Qualitative Study Using Grounded Theory

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Background & Hypothesis:
An extensive research was conducted to explore how the public perceive people with mental illness (PMI). However, most studies focused on the level and quantity of contact with PMI, and none examined the quality of the contact with them. Therefore, this study used qualitative research methods to develop a theory to explain the contribution of quality of contact with people with mental illness on how Asian adolescents perceive mental illness.

Methods:
A semi-structured interview was conducted with 15 Asian older adolescents aged 17 to 20 years old and their experiences and perceptions were analysed using Grounded Theory (GT).

Results:
Three theoretical concepts: 1) "quality of contact with mental illness", 2) "perceptions of PMI", and 3) "reactions towards PMI" were identified in the first stage of analysis. Another theoretical concept: 4) "other factors of influence" was identified in the second stage of data analysis. An explanatory framework of adolescents' perceptions of mental illness was developed.

Discussion & Conclusion:
The findings suggested that adolescents who had unfavourable contact with mental illness held more negative perceptions of and reactions towards PMI. However, recognition of the personal strengths or talents of PMI was found to facilitate adolescents' positive perceptions of PMI. Direct contact with PMI, cultural role, religious teaching, public and family education were also found to influence adolescents' perceptions of PMI. Some strategies such as sharing of personal recovery stories by PMI in-person and open discussion of mental health issues should be included in the future primary care mental health promotion programme for adolescents.

SGPCR-P-02

Knowledge of Primary Care Staff towards MRSA and MSSA

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Background & Hypothesis:
In NHGP, methicillin-resistant *Staphylococcus aureus* (MRSA) and methicillin-sensitive *Staphylococcus aureus* (MSSA) comprise 93.5% of all multidrug-resistant organisms (MDRO) cases. Managing patients with MRSA and MSSA infections in primary care is complex, as healthcare professionals have little influence over the environment which patients have to manage independently. This study seeks to find out the knowledge levels of primary care staff towards MRSA and MSSA.

Methods:
A cross-sectional questionnaire survey was conducted on doctors, nurses, physiotherapists and podiatrists of all 9 polyclinics under NHGP. A total of 299 staff were recruited, with a response rate of 61.8%. Knowledge of MRSA and MSSA was investigated and analysed.

Results:
The median knowledge score was 8, out of a maximum score of 10. A total of 63.7% of nurses, 57.8% of doctors and 33.3% of allied health professionals (AHP) scored ≥ 8. There was a statistically significant difference between knowledge scores of doctors, nurses and AHP ($P = 0.036$), and posthoc analysis revealed a statistically significant difference between nurses and AHP ($P = 0.012$). There was no association between years of healthcare working experience and knowledge scores. Additionally, 25% of all participants did not identify the full set of personal protective equipment that is required to handle MRSA and MSSA cases.

Discussion & Conclusion:
More training and publicity are needed to increase the knowledge and awareness of MRSA and MSSA among primary care staff. Further analysis could be performed to study if knowledge translates to adherence to infection control guidelines. This is vital as more patients seek routine primary care at the polyclinics upon discharge from the hospitals.

SGPCR-P-03

Predictors of Depression in Primary Care

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Background & Hypothesis:
Mental health services in primary care delivered by a physician-led, multidisciplinary team in a polyclinic within the central region of Singapore offers screening, assessment, stabilisation, treatment and rightsiting of adult patients with comorbid chronic diseases, mild or moderate mental health disorders. The high prevalence of depression in primary care inspired this study that explored predictors of depression.

Methods:
Medical records of 190 patients seen in 2013 were retrieved. Their demographics (gender, age, ethnicity, education, marital status, employment status, and psychiatric history), chronic disease indicators (HbA1c for diabetes, blood pressure for hypertension, and LDL for hyperlipidaemia), body mass index, mental health (Patient Health Questionnaire-9 for depression, Generalised Anxiety Disorder-7 for anxiety, and Insomnia Severity Index for insomnia) and functioning (Global Assessment of Functioning and Sheehan Disability Scale) were analysed.

Results:
Results of multiple regression analysis indicate chronic disease predicts depression ($R^2 = 0.85$, $F_{(8, 17)} = 12.16$, $P = 0.00$). Diabetes is positively correlated with depression ($\beta = 0.23$, $P = 0.04$). Demographic status significantly predicts depression ($R^2 = 0.35$, $F_{(22,166)} = 4.02$, $P = 0.00$). Age ($\beta = -0.28$, $P = 0.02$) is negatively correlated to depression, and being divorced ($\beta = 0.22$, $P = 0.00$) is positively correlated to depression.

Discussion & Conclusion:
The significance of screening is supported for demographic and diabetes that predict higher risk of depression. This increases practitioners' attention to patients' vulnerability to depression, ensuring appropriate referrals for rightsiting of patients to maximise efficiency and utilisation of limited mental health resources across community, primary and specialist care.

YIA-BSTR-01

Effects of Chronicity and Brain White Matter Microstructure Differences in Deficit and Non-Deficit Subtypes of Schizophrenia

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Background & Hypothesis:
The deficit subtype of schizophrenia (SZ), characterised by enduring negative symptoms, is associated with poorer prognosis and sociocognitive functioning. Few studies have applied diffusion tensor imaging (DTI) to investigate differences in white matter (WM) microstructure between clinical subtypes. We sought to determine if: 1) there were WM differences between subtypes and healthy controls (HC), and 2) WM differences between subtypes were present early in the disease.

Methods:
A total of 150 subjects (93 SZ, 57 HC) were examined using a whole brain voxel-wise approach, controlling for age and gender. SZ subjects were classified into 27 deficit (DSZ) and 66 non-deficit (NDSZ) patients based on the Proxy for the Deficit Syndrome method (PDS) using PANSS. A secondary analysis compared 28 age- and gender-matched first episode (FE) patients selected from subtypes and 14 HC.

Results:
Significantly reduced fractional anisotropy (FA) and increased radial diffusivity (RD) were found in DSZ and NDSZ compared to HC (all P <0.05). DSZ showed reduced FA and increased RD in the corpus callosum, corona radiata, internal and external capsule, uncinate fasciculi, right superior longitudinal fasciculus and fornix (all P <0.05), compared to NDSZ. In the secondary analysis, FE-DSZ also showed significantly reduced FA in diffuse WM regions compared to FE-NDSZ (P <0.05). FE-NDSZ was not significantly different from HC on all diffusivity indices.

Discussion & Conclusion:
The convergence of our findings from both samples demonstrates the presence of significant WM disruption in the deficit syndrome even at first episode. These findings could potentially aid in the early identification and monitoring of a more vulnerable group within the disorder.

YIA-BSTR-02

Single-Molecule, Real-time (SMRT) Sequencing Characterises a Novel New Delhi Metallo-Beta-Lactamase (NDM)-Positive Plasmid, Psg1-NDM Associated with Rapid Inter-Institutional Spread in Singapore

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Background & Hypothesis:
NDM-positive bacterial infection is associated with significant morbidity and mortality. Tracking inter-institutional spread of carbapenemase genes remains enigmatic due to the multi-tiered nature of plasmid gene dissemination. We aimed to characterise the whole genomes of 33 NDM-producing *Enterobacteriaceae* isolates in Singapore.

Methods:
Thirty-three unique Singapore NDM-producing *Enterobacteriaceae* isolates were sequenced using Illumina and PacBio SMRT platforms. A novel, virtual microarray phylogenetic model was used to integrate epidemiologic and whole-genome data.

Results:
Of the 33 whole-genome sequenced NDM-positive Singapore isolates from 4 major hospitals (time period: 2010 to 2014), 22 were *K. pneumoniae* (varied STs), 10 *E. coli* (varied STs) and 1 *E. cloacae*. Ten distinct NDM-positive plasmids were identified, of which 9 were found in varied bacterial hosts and identical to known whole-plasmids in Genbank [20 isolates: *pNDM-ECS01* (Thailand), 2 isolates: *pNDM-MAR* (Morocco), single isolate: *pNDM_MGR194* (India), *pNDM-KN* (Kenya), *pNDM-JVAP01* (Spain), *pGUE-NDM* (France), *pittNDM01_plasmid1* (USA), *blaNDM_plasmid2* (USA)]. A novel 90,103bp IncR NDM-positive plasmid, *pSg1-NDM*, was detected only in *K. pneumoniae ST147*. The *pSG1-NDM-K. pneumoniae ST147* combination was present only after 2013 with extensive spread between 2 hospitals. *pSg1-NDM* harboured multiple resistance genes and had undergone extensive recombination.

Discussion & Conclusion:
SMRT sequencing enabled timely characterisation of a novel, rapidly spreading plasmid, *pSg1-NDM*. Plasmid recombination is likely an evolutionary mechanism facilitating plasmid adaptation for rapid spread in local ecological niches.

YIA-BSTR-03

A Novel Approach for Gene Silencing in Human T-Lymphocytes with Therapeutic Implications

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Background & Hypothesis:
Modulating T-lymphocyte functions by RNA interference-mediated gene silencing holds tremendous potential to better understand lymphocyte biology and also has therapeutic implications. However, T-cells are refractory to transfection with interfering RNAs using conventional methods. Herein, we show that locked nucleic acid-conjugated chimeric antisense oligonucleotides, called "GapmeR", can be delivered through gymnosis (i.e. unassisted uptake) to efficiently knockdown specific genes in human T-cells.

Methods:
Target-specific GapmeR, designed using "oligo-design algorithm", were synthesised commercially and applied on primary human T-cells and a cutaneous T-cell lymphoma (CTCL) line *HuT78*. Molecular and imaging assays including Western-immunoblotting, flow-cytometry, confocal microscopy and high content analysis were performed.

Results:
To examine cellular uptake of GapmeR, we incubated primary human T-lymphocytes or *HuT78* T-cells with various concentrations (10-1000 nM) of fluorescently (FAM)-labelled non-targeting GapmeR for gymnotic delivery or electroporated by nucleofection. Flow-cytometry analysis at multiple time-points (6-72 h) indicated a dose- and time-dependent internalisation of GapmeR, which was also confirmed by confocal microscopy. We next designed specific GapmeR targeted against a panel of 5 molecules (450kDa CG-NAP, 200kDa Talin1, 100kDa LFA-1, 80kDa PKCε and 18kDa stathmin) and achieved ≥60% knockdown of proteins as analysed by Western immunoblotting. Of note, GapmeR-mediated knockdown of STAT3, a molecular target of CTCL, caused ≥50% cell death in 72 h.

Discussion & Conclusion:
We demonstrate an efficient gene silencing strategy in human T-cells using self-delivering GapmeR. This technique opens new avenues for manipulating T-cell functionality and may serve as a novel therapeutic modality in many immune-related diseases including cancer, inflammation and autoimmunity.

YIA-CR-01

New Insights into Diabetic Retinopathy – Risk Factors for Prevalence, Incidence and Progression in Asians

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Background & Hypothesis:
Diabetic retinopathy (DR) is a leading cause of blindness. There are few studies on its risk factors in Asian populations and none on its rate of progression. We evaluate the risk factors associated with the prevalence, incidence and rate of progression of DR.

Methods:
Longitudinal cohort study of 250 consecutive patients with diabetes mellitus, examined annually by ophthalmologists over a 5-year period was conducted. Multivariate logistic regression analysis was performed on the demographic and clinical risk factors.

Results:
Prevalence of DR at baseline was 54.2%. On multivariate analysis, risk factors were age (odds ratio [OR] 0.92, 95% confidence interval [CI] 0.90-0.95, P <0.001) and DM duration (OR 1.05, 95% CI 1.01-1.08, P = 0.005). The 5-year incidence was 35.8%, with 11.9% developing moderate or severe non-proliferative DR (NPDR). Risk factors included DM duration (OR 1.05, P = 0.008), age (OR 0.92, P <0.001) and treatment type (OR 1.4, P = 0.015). Progression time between stages of DR shortened with increasing severity–normal to mild NPDR: 3.7 years; mild to moderate NPDR: 2.9 years; moderate to severe NPDR: 1.4 years. Stratifying by age, the youngest cohort (<60 yrs) progressed at the fastest rate compared to older cohorts (2.8 years vs 3.6 [60-69 yrs] vs 4.2 [≥70 yrs]). The presence of macular edema at baseline was a significant risk for the incidence and progression of DR.

Discussion & Conclusion:
Rate of progression of DR has not previously been described. DR progression accelerates with increasing severity, and is fastest in younger patients with longer duration of disease. Younger age and duration of DM are important risk factors for both prevalence and incidence.

YIA-CR-02

Colour Fundus Photo Features that Predict Structural Retina Abnormalities in Diabetic Retinopathy

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Background & Hypothesis:
National screening protocols for diabetic retinopathy employ colour fundus photography (CFP) as primary imaging modality. Two-dimensional CFP does not pick up structural abnormalities of the retina, which constitutes criteria for treatment. Using optical coherence tomography (OCT), 3-dimensional (3D) transverse images of retina is microscopically reconstructed which reveals structural abnormalities. We aimed to correlate CFP features of diabetic retinopathy with OCT and evaluate CFP features that predict retina structural abnormalities requiring more urgent referral to tertiary eye centres.

Methods:
In a prospective study, 115 diabetic patients underwent CFP and OCT. Each modality was graded separately by masked graders. Sensitivity and specificity of various CFP features in identifying structural abnormalities on OCT were evaluated.

Results:
CFP as a screening tool has sensitivity of 100% and specificity of 83.8% in predicting OCT abnormalities (positive predictive value [PPV] 71.8%; negative predictive value 100%). Hard exudates were strongly associated with the presence of OCT abnormalities (specificity 100%; PPV 97.7%), especially if these were located within 1 disc diameter (DD) of the fovea. Other features predictive of OCT abnormalities included blot hemorrhages (specificity 91.5%; PPV 83.7%) and cluster of micro-aneurysms. Eyes with only isolated micro-aneurysms instead were more likely to have normal OCT findings (normal OCT 63.6% vs. abnormal 36.4%), especially if these were located beyond 1 DD of the fovea.

Discussion & Conclusion:
We identified CFP features of diabetic retinopathy which are predictive of retinal abnormalities on OCT. This may help towards refining national screening protocols and referral criteria for diabetic retinopathy.

YIA-CR-03

Quality of Life and Cognitive Functioning in Adult Patients with Schizophrenia: A Longitudinal Perspective

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Background & Hypothesis:
Quality of Life (QOL) and cognitive function are regarded as important outcomes in the treatment of schizophrenia (SCZ). This study examined QOL differences and cognitive function over time in SCZ patients. We hypothesised that QOL scores and cognitive function would improve over time in patients.

Methods:
A total of 198 subjects (68 healthy controls, HC and 130 SCZ), matched for age and sex were assessed in QOL, neurocognitive functioning, psychopathology and psychosocial functioning using WHOQOL-Bref, BACS, PANSS and GAF respectively at baseline. A subset of 74 participants was re-assessed at a second time point as part of a longitudinal study. ANCOVA and paired t-test were employed to compare QOL and cognitive functioning cross-sectionally and longitudinally.

Results:
At baseline, HC reported significantly higher QOL ratings in all domains (P <0.05) and specific neurocognitive domains, namely motor speed, symbol coding, verbal fluency and BACS composite compared with SCZ (all P <0.001). Longitudinally, HC showed improvement in verbal memory (P = 0.033), digit sequencing (P <0.001), Tower of London (P <0.001) and BACS composite domains (P = 0.018), with no improvements in patients (all P >0.1). There were no significant changes of QOL ratings across time for both groups. Over time, patients' level of psychosocial functioning improved (P <0.05).

Discussion & Conclusion:
Cognitive deficits and poorer QOL ratings at baseline tend to persevere over time in patients with schizophrenia. This behooves better understanding of the onset of such deficits in the developmental trajectory of the illness and for clinicians to treat these clinical features more aggressively in the holistic management of our patients with schizophrenia.

YIA-HSR-01

Predicting Caregiver Distress Using the Caregiver Reaction Assessment

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Background & Hypothesis:
Research has shown that caregiving can cause a significant amount of distress. The aim of the present study was to determine which aspect of providing care to people with mental illness, as operationalised by the Caregiver Reaction Assessment (CRA), had the greatest impact on distress.

Methods:
A total of 350 primary caregivers of relatives with mental illness were recruited through convenient sampling from outpatient clinics at the Institute of Mental Health. Experiences of caregiving were assessed using the CRA which captures 4 domains: impact on schedule and health (ISH), caregiver esteem (CE), lack of family support (LFS), and impact on finances (IF). To measure distress, participants completed the Patient Health Questionnaire (PHQ-9) and Generalised Anxiety Disorder scale (GAD-7). Multiple linear regressions were run with PHQ-9 and GAD-7 scores as outcome variables and CRA domains as predictors.

Results:
Sociodemographic variables including age, gender, ethnicity, education, income, relationship with patient and medical condition were controlled for in the regression analyses. Of the 4 domains, the ISH ($\beta = 3.67$, $P < 0.001$) and IF ($\beta = 0.79$, $P < 0.05$) were significant predictors of PHQ-9 scores. The ISH ($\beta = 2.94$, $P < 0.001$) and IF ($\beta = 0.79$, $P < 0.05$) also significantly predicted GAD-7 scores.

Discussion & Conclusion:
Impact on finance, health and disrupted schedule predicted distress among caregivers of relatives with mental illness. Additional social and medical support to address issues related to finances and health and time management is relevant in reducing caregiver distress. Caregiver esteem and lack of family support were not identified as significant sources of distress by this study.

YIA-HSR-02

Prevalence of Diabetes Mellitus and Dyslipidaemia in Inpatients at Institute of Mental Health (IMH)

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Background & Hypothesis:
We aimed to determine the prevalence and control of diabetes mellitus (DM) and dyslipidaemia in an inpatient population at Institute of Mental Health (IMH) and compare it to the general population.

Methods:
Data was collected from a study to assess physical health status of 112 inpatients with severe mental illness, who have stayed ≥1 year in IMH. Diagnosis of DM and dyslipidaemia was based on inpatients' medical records and current medications. Fasting blood glucose and lipids levels were determined after overnight fasting. Prevalence of DM and dyslipidaemia in the general population was obtained from the National Health Survey 2010 report.

Results:
The sample comprised 85.7% males and 14.2% females with mean age of 56.1 years. Prevalence of DM in the study population was 17.9%, of which 90% had adequate glycaemic control, defined as HbA1c ≤7.0 mmol/l. Of the 82.1% undiagnosed through records, 2.2% were found to have DM, defined as a fasting glucose levels ≥7.0 mmol/l. Prevalence of dyslipidaemia was 63.4%, of which 88.7% had desirable total cholesterol, defined as total cholesterol <5.2 mmol/l. Of the 36.6% undiagnosed through records, none were found to have dyslipidaemia, defined as total cholesterol ≥6.2 mmol/l.

Discussion & Conclusion:
The prevalence of DM and dyslipidaemia were found to be higher in inpatients compared to the general population where the prevalence of DM and dyslipidaemia was 11.3% and 17.4% respectively. However, the 2 chronic illnesses were well controlled in this population of inpatients in IMH and few were undiagnosed. This could be due to regular monitoring of the inpatients as well as supervised diet control and regular physical activities.

YIA-HSR-03

Predicting 72-hour Reattendance among COPD Patients at the Emergency Department

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Background & Hypothesis:
Chronic obstructive pulmonary disease (COPD) is a major cause of morbidity and mortality that often leads to high utilisation at the emergency department (ED). The objective of this study is to develop a model to predict 72 hours reattendance at the ED among COPD patients.

Methods:
All ED encounters by COPD patients discharged without hospitalisation in 2011-2012 were used for model derivation. The model was prospectively validated using 2013 dataset. Variables considered were demographics, patient acuity categories (PAC), primary diagnosis, social issues, vital signs and lab tests. Logistic regression adjusted for significant factors ($P <0.01$) and clustering effect was conducted to develop the model. Receiver operating characteristic (ROC) curves was applied to assess the discrimination power of the model.

Results:
Of 3,869 ED encounters among COPD patients, 28% resulted in reattendance at the ED within 72 hours. Age, race, COPD-related diagnoses, neurotic disorder, social issues and PAC 1 status were the most predictive factors for ED reattendance. C-statistics of the ROC curve was 0.85 while sensitivity and specificity of the model were 61.7% and 91.9% respectively (risk score = 0.5). Applying the developed model to the validation set demonstrated good discriminative power (ROC = 0.81).

Discussion & Conclusion:
Patients with COPD commonly attend ED. We have developed a model that identified high-risk characteristics of ED reattendance within 72 hours. The model demonstrated good calibration performance on the validation set. This could potentially assist emergency physicians with appropriate disposition, reducing the risk of emergency reattendance among COPD patients.

YIA-SO-01

Influence of Neuropsychiatric Symptoms on Physical Frailty in Community-Dwelling Older Adults with Cognitive Impairment

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Background & Hypothesis:
Neuropsychiatric symptoms are common complications of dementia and associated with significant morbidity, but their potential influence on frailty status has yet been examined. We sought to evaluate the association between neuropsychiatric symptoms and frailty in older adults with mild cognitive impairment (MCI) and mild-moderate Alzheimer's dementia (AD).

Methods:
This is a cross-sectional study involving 99 older adults with MCI and mild to moderate AD. All patients were assessed using Modified Buchman's criteria for physical frailty. Neuropsychiatric symptoms were assessed using Neuropsychiatric Inventory (NPI) questionnaire and classified into 4 domains of mood, motor, inappropriate behaviour and psychosis. Data on comorbidities, cognitive and functional performance, and nutritional status were collected.

Results:
Twenty (20%) patients were frail, and they were significantly older than their non-frail counterparts (79.60 ± 5.24 vs 75.81 ± 6.81, $P = 0.022$). Frail patients have a greater number of neuropsychiatric domains involved ($P = 0.052$). NPI domain of inappropriate behaviour ($P = 0.011$), with domain symptoms of agitation and aggression ($P = 0.026$), and appetite and eating disorders ($P = 0.027$) were significantly associated with frailty. In multiple logistic regression adjusted for age, NPI domain of inappropriate behaviour (OR 3.40, 95% CI 1.099-10.526, $P = 0.034$) was independently associated with physical frailty. In subgroup analysis, anxiety ($P = 0.008$) was the only NPI symptom associated with frailty in MCI, while NPI-inappropriate behaviour domain ($P = 0.016$) and symptoms of agitation/aggression ($P = 0.046$) were significant in AD.

Discussion & Conclusion:
Neuropsychiatric symptoms, in particular inappropriate behaviour, are potentially modifiable factors of frailty in cognitively impaired older adults. Patients with neuropsychiatric symptoms should be considered for frailty screening.

YIA-SO-02

Caregiver Burden in Relation to Cognitive Impairment, Function, Behaviour and Resource Utilisation in Older Adults Attending an Outpatient Memory Clinic

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Background & Hypothesis:
Cargiver burden remains a major reason for institutionalisation in dementia. We thus aimed to examine how cognition, function, behaviour and caregiving hours impacted caregiver burden.

Methods:
This is a cross-sectional study involving 227 predominantly Chinese dementia patient-caregiver dyads from a memory clinic setting. Cognition was measured by CMMSE and staged using Clinical Dementia Rating (CDR). Function was measured by Barthel's Basic Activities of Daily Living (BADL) and Lawton's Instrumental Activities of Daily Living (IADL), while Resource-Utilization in Dementia (RUD-Lite) measured caregiving hours. Burden was measured by Zarit Burden Interview (ZBI); with a cutoff score 36 dichotomising "high" and "low"-burden groups. We also collected demographics and Neuropsychiatric Inventory Questionnaire (NPI-Q) information. Bivariate analyses were conducted between "high" and "low" ZBI groups; subsequently multiple logistic regression analysis were then performed with significant variables, and repeated with addition of RUD-lite.

Results:
On bivariate analysis, BADL and IADL impairment, BADL assistance and supervision caregiving time, cognition (CDR-Global), depression and delusion were found to be significantly different between high and low burden groups. On multivariate analysis, only Lawton's IADL was found to be significantly associated with burden (Exp B = 0.89, CI: 0.808-0.982, P = 0.020). Addition of RUD-lite found time assisting BADL (Exp B = 1.21, CI: 1.001-1.461, P = 0.049) to be associated with high caregiver burden.

Discussion & Conclusion:
This study demonstrates that independent functional status of persons with dementia had the biggest impact on caregiver burden. Interestingly, key components of RUD-lite (assisting BADL and supervising patient hours/day) were also important although the bidirectional relationship between resource utilisation and burden merits further study.

YIA-SO-03

Choroidal Vascularity Index: A Non-Invasive Optical Tool to Assess Vascular Status of the Choroid in Healthy Eyes from a Population-based Study

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Background & Hypothesis:
Choroid vascularity could be implicated in the pathogenesis of various ocular diseases. We aim to introduce the first quantifiable parameter to assess choroid vascular status in vivo, called choroidal vascularity index (CVI), to establish normative database for CVI and to identify factors associated with CVI in healthy eyes.

Methods:
In this population-based study, enhanced depth imaging optical coherence tomography scans of the choroid on 345 healthy eyes were obtained and subfoveal choroidal thickness (SFCT) measured. Image binarisation was performed on the scan images. The subfoveal choroidal area (TCA) was segmented into luminal or vascular area (LA) and stromal or interstitial area (SA), and CVI (proportion of LA to TCA) was computed. Linear regression was used to identify factors associated with both CVI and SFCT.

Results:
A total of 45% of the subjects were male with mean age of 61.53 years. CVI ranged between 60 to 71.2% with mean value of 65.61 ± 0.02 (95% confidence interval, 65.3-65.8). Physiological factors associated with thicker choroid include younger age, shorter axial length and lower intraocular pressure. In contrast, there was no significant association between CVI and these factors. The most significant determinant of thicker choroid was greater LA ($P < 0.001$), and thicker choroid was associated with higher CVI. SA was not associated with SFCT ($P = 0.49$).

Discussion & Conclusion:
Baseline CVI of 66% in healthy eyes was established. CVI was elucidated as a significant determinant of CT. While SFCT was affected by many factors, CVI remained unaffected. CVI can hence be an additional optical biomarker for assessing choroid-involving diseases with potential for clinical translation.

YIA-SP-01

Effects of Fenofibrate on Pigment Epithelium-Derived Factor (PEDF) in Clinical Human Subjects and ARPE-19 Eye Cells

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Background & Hypothesis:
Fenofibrate, a peroxisome proliferator-activated receptor-alpha (PPARα) agonist, has been shown to retard the progression of diabetic retinopathy (DR). This benefit is independent of its lipid-modifying properties. PEDF, an antiangiogenic protein, has been shown to inhibit the development of DR. We hypothesised that fenofibrate modified PEDF expression, contributing to protective effects on DR. This study evaluated the effects of fenofibrate treatment on PEDF expression, using both clinical and in-vitro models.

Methods:
Six-hundred T2D subjects were recruited from Diabetes Centre, KTPH. PEDF [ELISA (Biovendor)] in fasting plasma, was compared between fenofibrate-treated and untreated patients. Human ARPE-19, a retinal pigment epithelium cell-line, was treated with fenofibrate (0-100μM) for 18 hours. The cell lysates and media were collected for analysis. PEDF mRNA and protein were measured by real-time quantitative PCR and Western blot, respectively.

Results:
In the clinical study, mean age of the cohort was 58 ($\pm$11) years (male: 48%). Patients on fenofibrate (n = 68) had significantly higher PEDF [18.06 μg/ml ($\pm$6.07) vs 15.72 μg/ml ($\pm$5.10); $P = 0.001$], even after adjusting for baseline HDL-C, triglyceride and BMI. In ARPE-19, fenofibrate increased PEDF mRNA expression by 1.38-1.59 folds ($P = 0.002$) and protein expression by 1.23-2.84 folds, compared to DMSO controls.

Discussion & Conclusion:
The overall results suggested a causal relationship whereby fenofibrate increases PEDF. Our findings suggest fenofibrate's beneficial effect in DR could at least in part due to its effect on PEDF expressed potentially reducing superfluous angiogenesis responsible for the pathogenicity and progression of DR.

YIA-SP-02

Evaluation of Thrombin Generation Potential among Healthy Population and Patients under Warfarin Therapy

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Background & Hypothesis:
Thrombin generation potential is the capacity of an individual to generate thrombin during hemostasis. Routine assays such as PT and INR, while used to monitor warfarin therapy, have been shown to correlate poorly with clinical phenotypes. Thrombin generation tests like calibrated automated thrombinography is emerging as a promising approach in assessing the coagulation cascade in plasma. We aimed to define the normal thrombin generation potential among normal healthy population in Singapore and to evaluate the use of CAT for monitoring patients on warfarin therapy.

Methods:
We evaluated thrombin generation profile (including endogenous thrombin potential, ETP, peak thrombin and velocity index) by CAT in 60 healthy blood donors and 29 patients on warfarin.

Results:
Among healthy blood donors, the reference ranges were: ETP: 1546.27 ± 404.98, peak thrombin: 279.98 ± 84.75, velocity index: 91.47 ± 38.82. In subgroup analysis, there was no statistical significant difference in the thrombin generation profile between male and female donors. Subgroup by race showed a significant difference in mean endogenous thrombin potential (95% confidence interval, CI 556.415-597.983 nM/min), peak thrombin (95% CI, 92.366-115.785 nM) and velocity index (95% CI, 24.022-45.687 nM/min) between Chinese and Indian donors. Significant negative correlation was observed between INR and ETP ($r = -0.685$, $P < 0.05$), peak thrombin ($r = -0.685$, $P < 0.05$), and velocity index ($r = -0.668$, $P < 0.05$).

Discussion & Conclusion:
Our preliminary results showed there may be difference in thrombin generation profile among different races. CAT may also be used as a reliable tool to monitor patients on warfarin.

YIA-SP-03

Early and Late Metabolic Outcomes between Roux-en-Y Gastric Bypass and Sleeve Gastrectomy in Obese Diabetic Patients

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Background & Hypothesis:
Roux-en-Y gastric bypass (RYGB) surgery and sleeve gastrectomy (SG) are the 2 most common bariatric procedures for weight and diabetes management in patients with severe obesity. We compared early and late metabolic changes after RYGB and SG surgery in obese diabetic patients and examined for predictors of diabetes remission.

Methods:
This was a prospective study of 20 obese patients with type 2 diabetes mellitus who underwent bariatric surgery at the National University Hospital, Singapore, from May 2010 to September 2013. Ten patients underwent RYGB and 10 patients underwent SG. A standard 75-gm oral glucose tolerance test (OGTT) was performed before and 1-month after the surgery. Cox regression was performed to determine predictors of diabetes.

Results:
At 12-month follow-up, 14 (70%) patients achieved diabetic remission with statistically significant changes in BMI (-9.86 kg/m^2), HbA1c (-2.24%), fasting glucose (-2.49 mmol/L), triglycerides (-0.97 mmol/L), and HDL-cholesterol (+0.26 mmol/L). Both surgical groups were comparable in metabolic outcomes except for HDL-cholesterol which was significantly higher in SG than RYGB (mean ± SE 1.51 ± 0.10 mmol/L vs 1.25 ± 0.07 mmol/L, respectively). At 1-month after surgery, Mat-ISI improved by 81.8 ± 19.1% and HOMA-IR by -39.8 ± 9.8% with no significant group difference. There was a significant reduction in the plasma glucose at 90 min (-16.72 ± 6.74%) and 120 min (-25.39 ± 8.38%) post-OGTT. Changes in these glucostatic parameters did not predict diabetes remission at 12-month follow-up.

Discussion & Conclusion:
Glucose tolerance and insulin sensitivity improved early after bariatric surgery, but did not predict long-term diabetes remission. Metabolic changes at early and late period after surgery were similar between RYGB and SG groups.

OP-AH-01

Psychotic Symptoms among an Elderly Population in Singapore: Prevalence, Associated Factors and Healthcare Utilisation

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Background & Hypothesis:
Few studies have examined the prevalence of psychotic symptoms in the elderly populations. The aim of this study was to establish the prevalence of psychotic symptoms, sociodemographic correlates and healthcare utilisation among elderly without dementia in Singapore.

Methods:
Data from a population-based epidemiological survey of a representative sample of elderly aged 60 years and above were used. A total of 2166 elderly without dementia were included in this analysis. Psychotic symptoms were assessed with the Geriatric Mental State Examination. Individuals having either hallucinations or persecutory delusions or both were labelled as having "any psychotic symptom".

Results:
The prevalence of any psychotic symptom was 5.2%. The prevalence of persecutory delusions and hallucinations was 2.8% and 2.7%, respectively. Malay ethnicity and having no formal education were significantly associated with hallucinations, while those aged 75 to 84 years were less likely to be associated with hallucinations. Homemaker status was less likely to be associated with persecutory delusions and any psychotic symptom. Significant associations were found between psychotic symptoms and depression and irritability; persecutory delusions and poor cognitive performance; and hallucinations with eyesight problems and hearing difficulty or deafness. Hallucinations were also significantly associated with higher number of visits to primary care doctors.

Discussion & Conclusion:
The prevalence of psychotic symptoms among elderly without dementia in Singapore was higher than that reported from Western samples. Identified sociodemographic correlates and healthcare utilisation need further research for future health service planning and targeted interventions.

OP-AH-02

Impact of Anticholinergic Burden on Cognitive Performance in Patients with Schizophrenia

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Background & Hypothesis:
Both schizophrenia and anticholinergic medications have been independently associated with cognitive impairments, and cognitive impairments in schizophrenia is strongly associated with impairment in overall functioning. However, the additive impact of medications with anticholinergic properties (anticholinergic burden) in schizophrenia is unclear. This study aims to explore the association between anticholinergic burden and cognitive profile in schizophrenia.

Methods:
A total of 707 patients with schizophrenia were recruited and assessed on the Brief Assessment of Cognition in Schizophrenia (BACS)—a comprehensive neurocognitive battery which consists of 6 tasks (Verbal Memory (VM), Digit Sequencing (DS), Token Motor Task (TMT), Semantic Fluency (SF), Symbol Coding (SC), and Tower of London (TOL)) to assess verbal memory and learning, verbal working memory, motor speed, speed of information processing and executive functioning. The test scores were normalised and adjusted for age and gender. Medication data was recorded and total anticholinergic burden was calculated using an anticholinergic potency list.

Results:
In unadjusted regression analyses, anticholinergic burden was associated with poorer cognitive performance in all tasks. Multiple regression analyses, adjusting for number of medications, revealed that higher anticholinergic burden was significantly associated with poorer performance in VM ($P <0.001$), DS ($P <0.001$), TMT ($P = 0.018$) and TOL ($P = 0.023$).

Discussion & Conclusion:
The results suggest that anticholinergic properties of all medications may have an additive adverse impact on patients' verbal memory, working memory, motor speed and executive functioning. Therefore, clinicians should minimise prescription of medications with anticholinergic properties to alleviate the overall cognitive burden in schizophrenia.

OP-AH-03

Effectiveness of Podiatric Nail Surgery for Patients with Onychocryptosis by Tan Tock Seng Hospital Podiatry Department: An Observational Study

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Background & Hypothesis:
Onychocryptosis or ingrown toenail (IGTN) is a common nail disorder which when recurrent or painful, often requires surgical treatment. Podiatric nail surgery (partial or total nail avulsion with phenolisation—PNA/TNA) has been described as effective in treating such condition and preventing symptomatic recurrence. This observational study aims to review the clinical outcomes of this procedure in treating IGTN patients seen in a large restructured hospital in Singapore.

Methods:
Clinical outcomes for patients who have undergone podiatric nail surgery between July 2012 to November 2014 were reviewed. Podiatrists performing the procedure followed a standard protocol. Patients were reviewed 3 days postoperative and weekly until their wound is healed. Patients were then reviewed 3 months posthealing.

Results:
A total of 28 patients with IGTN had undergone podiatric nail surgery for 40 toenails. Thirty-five toenails were for PNAs and 5 for TNAs. The average healing period was 32 days for PNA and 48 days for TNA. Two out of 28 patients had nail regrowth after 3 months, out of which 1 had a recurrence of symptoms. The average patient satisfaction score was 4.52 out of 5.

Discussion & Conclusion:
Average healing period of PNA, rates of regrowth and recurrence of symptoms were found to be comparable to those presented in the literature. High patient satisfaction was found with outcomes of the procedure. Podiatric nail surgery showed effective results in reducing recurrence and symptoms in patients with IGTN.

OP-AH-04

Assessing the Effects of Central Vestibular Sensitivity on Motion Sick Susceptibility

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Background & Hypothesis:
This study aimed to determine the effects of central vestibular sensitivity (CVS) on motion sick susceptibility (MSS), through the velocity storage's function of prolonging the duration of slow-phase eye velocity (SPEV) and perceived rotational duration (PRD), in healthy individuals with different motion sick susceptibility.

Methods:
A total of 25 controls and 25 highly motion sick susceptible subjects were recruited and first screened for any peripheral vestibular (horizontal semi-circular canal and saccular function) and central disorders, using videonystagmography, video head impulse and cervical vestibular myogenic potential tests. Next, participants were tested on the rotatory chair to obtain the slow-phase eye velocity time constant (spev tc) and perceived rotational duration (prd). Readings were then compared for significant differences between control and subject group.

Results:
Results generally showed no significant difference in SPEV TC between control and subject group for slow and fast rotations. However, there was significant difference in the PRD between these 2 groups. Multiple regression analysis indicated that postrotatory PRD and the number of motion sick symptoms reported were positively correlated with the degree of MSS and were hence, significantly strong predictors.

Discussion & Conclusion:
Highly MSS individuals were observed with elevated PRD in general, indirectly suggesting greater velocity storage efficiency, hence, greater CVS; CVS is therefore positively correlated with MSS. PRD could be an objective indicator of motion sick susceptibility and may help in the verification of therapeutic interventions at reducing susceptibility to motion sickness. This may guide future studies on evaluating the efficacy of habituation exercises.

OP-AH-05

A Randomised Double-Blinded Clinical Study on the Efficacy of Multimedia Presentation Using an iPad for Patient Education of Postoperative Hip Surgery Patients in a Public Hospital in Singapore

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Background & Hypothesis:
Improving the method of delivering patient education is paramount, especially if there is a language barrier in the Singapore context. The iPad may help to eradicate the language barrier by delivering information in multiple languages in a single interface. This study compared patient satisfaction and recall of hip surgery physiotherapy patient education between information presented on an iPad versus a standard paper booklet format.

Methods:
This single-centre study used a randomised parallel group design in which participants who had undergone hip surgery were randomly allocated into 2 groups. Hip fracture physiotherapy-specific patient education was presented via either an iPad (Group A) or a paper booklet (Group B) for 4 postoperative physiotherapy sessions. Prevalidated questionnaires were used to measure pre and postrecall of the education content and patient satisfaction.

Results:
A total of 42 participants with a mean age of 70 were recruited. Participants in both groups improved their recall of their hip surgery physiotherapy patient education. However, those receiving their patient education via an iPad improved their recall significantly more than via booklet by 4 points (95% CI, 3.16-4.95; $P < 0.001$). Patient satisfaction level was also significantly higher in iPad group than in booklet group by 8.5 (95% CI, 4.8-12.1, $P < 0.001$).

Discussion & Conclusion:
Whilst both intervention methods have positive outcomes on recall and satisfaction, the use of iPads for physiotherapy patient education of the postoperative hip surgery patients in this study in Singapore is a more effective method for significant content recall and satisfaction, compared to using the current paper booklets.

OP-AH-06

Identified Key Concerns of Clients in a Community Collaboration Initiative

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Background & Hypothesis:
The mental health industry has been known to operate in silos worldwide, often leading to preventable service gaps (Horvitz-Lennon, Kilbourne, & Pinus, 2006). Clients with severe mental illnesses (SMI) experience a sense of grief due to the loss of industry and self-worth (Matthewson, Langworthy, & Higgins, 2015), and these effects can be mitigated by collaborative community support. The main objective of this paper is to examine key concerns of clients in a community collaborative initiative.

Methods:
A total of 48 clients (F = 15, M = 33) were studied from April 2015 to June 2015; majority are Chinese, above 41 years of age, and have a psychotic diagnosis. The set of data was collected via interviews as well as documented notes from case files and the results were computed using Excel.

Results:
The Institute of Mental Health Singapore has bridged together various community agencies, such as the social service offices, the family service centres, and the voluntary welfare organisations. This in turn creates an opportunity for open communication channels between agencies. This partnership elucidated the top 3 concerns of these clients: their financial situation (n = 38), sense of isolation (n = 34), and need for tertiary support in the community (n = 12).

Discussion & Conclusion:
Based on the results, collaboration between community agencies is an integral step in ensuring that clients with SMI are adequately supported. By breaking out of the silo working style, these clients can receive holistic care, leading to increased self-worth, a sense of belonging and better illness prognosis.

OP-AH-07

Physical Activity Participation among Community-Dwelling Older Adults in Singapore

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Background & Hypothesis:
The objective of this study was to establish physical activity levels among community-dwelling Chinese older adults in Singapore, and to investigate factors that were associated with physical activity participation. This study also aimed to examine factors predicting physical activity intention and participation, based on the theory of planned behaviour (TPB).

Methods:
Ninety-two participants (aged 65 to 92) were recruited from 7 senior activity centres across Singapore for this cross-sectional study. A questionnaire containing closed-ended measures of physical activity, knowledge and constructs of the TPB was administered to each participant via a face-to-face interview.

Results:
More than half of the participants (58.7%) met the national recommended level of physical activity (≥150 minutes per week, of moderate intensity). About 56% of the participants were unaware of the recommended dose, while knowledge of the health benefits of regular physical activity among all the participants was modestly good. The factors that were associated with physical activity participation were marital status, knowledge of the recommended levels and knowledge of health benefits (P <0.05). In testing the TPB, only perceived behavioural control and subjective norm predicted intention (P <0.05), while intention and perceived behavioural control did not predict physical activity participation.

Discussion & Conclusion:
The results of this study highlighted important areas of focus and evaluation for current and future physical activity promotion efforts. The findings showed partial support for the use of the TPB to explain intention, but further studies would be required to examine its application in understanding physical activity participation.

OP-AH-08

Montreal Cognitive Assessment: Preliminary Findings on its Correlation with Functional Outcomes in Singapore's Stroke Patients

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Background & Hypothesis:
Montreal Cognitive Assessment (MoCA) is a brief screening tool that is reflective of cognitive function. Studies have suggested its use in predicting the functional outcomes of stroke patients. It is increasingly being used in the clinical setting in Singapore, involving various translated versions. However there are limited local studies investigating the viability of using MoCA in predicting outcomes of stroke patients postrehabilitation. This preliminary study was conducted to investigate the effect of MoCA in comparison with other variables, in predicting functional outcomes of the general stroke population in a rehabilitation hospital in Singapore.

Methods:
An observational retrospective data analysis was employed in this study. Data from stroke patients, who were admitted from 1 September 2013 till 31 March 2014, was retrieved from the database of Tan Tock Seng Rehabilitation Centre (TTSH RC). The extent of predictability of MoCA on functional outcomes of stroke patients based on the Functional Independence Measure taken on discharge (FIMD), in comparison with other commonly used measures, was investigated using regression analysis.

Results:
A total of 222 datasets were retrieved with 178 included in the final analysis. The prediction model in this study, inclusive of all outcome measures, accounted up to 61.2% of the variability in FIMD. MoCA alone accounted for 45.7% of variability in FIMD.

Discussion & Conclusion:
This study validated the use of MOCA as a screening tool to predict functional outcomes of stroke patients postrehabilitation in Singapore. Further research should encompass a multi-centre prospective study design to extend the generalisability of this finding to the general stroke population in Singapore.

OP-AH-09

Training Needs of Case Managers

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Background & Hypothesis:
Since 2003, IMH had case managers (CM) in their multidisciplinary team (MDT). The strength of CM is their ability to coordinate care for patients, thereby reducing service gaps, mainly fragmentation and duplication. Our CMs come from diverse training backgrounds (nurses, psychologist and social work). It is essential that they are trained to work independently to coordinate care as our patients are diverse in age groups, diagnosis and social issues. We provide a myriad of training opportunities for CMs. However, it is essential to provide training that will benefit and promote better clinical skills. This paper will provide a perspective on the CM's point of view of what constitutes essential training to them.

Methods:
A survey form on the various types of training that were provided to CMs was distributed to CMs in April 2015. The results of the survey were collated and analysed using the Microsoft Excel programme.

Results:
A total of 36 CMs (13 male and 23 female) of whom 67% were aged 21 to 40 years were surveyed, and 64% of them had social work/psychology qualification and 33% had nursing qualifications. Eighty-one percent had the opportunity to attend local overseas conferences while 95% found that the most useful training programmes were those organised by the department, for example solution focus therapy, mindfulness and cognitive behaviour therapy. The least useful training (67%) was identified as hospital journal club presentations.

Discussion & Conclusion:
Identifying the training needs of CM is important as we move towards developing a highly skilled CM workforce. This will ensure our patients are delivered quality and safe care.

OP-AH-10

A Longitudinal Study of Hippocampal Subfield Volumes in Schizophrenia and Bipolar Disorder

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Background & Hypothesis:
Volume deficits of hippocampus have been found in schizophrenia and bipolar disorder, which share phenomenological and genetic overlap. Here we sought to determine whether there are differential and progressive volume changes in the functionally distinct subfields of the hippocampus in schizophrenia and bipolar disorder over time.

Methods:
A longitudinal magnetic resonance imaging study of 3 demographically-matched cohorts that included 34 patients with schizophrenia, 14 patients with bipolar disorder and 41 healthy controls was performed. A novel, automated algorithm—constructed from ultra-high resolution postmortem hippocampal tissue images—was used to label the subfields. Linear mixed effects modelling was used to determine diagnostic differences in volume measures of hippocampal subfields over time.

Results:
In the right hippocampus, the volumes of the granule cell layer (GCL) of the dentate gyrus, *CA4*, *CA3*, *CA1*, molecular layer (ML) and subiculum decreased at a greater rate in both schizophrenia and bipolar patients, when compared to healthy controls (P <0.01). However in the left hippocampus, the pattern of subfield volume atrophy was only found in schizophrenia patients (P <0.01) but not bipolar patients. Posthoc contrasts revealed a differential atrophy of the *CA1* in schizophrenia and GCL in bipolar disorder (P <0.05). Regardless of diagnostic groups, the volumes of affected subfields declined faster in patients with worsening symptoms and declining general functioning.

Discussion & Conclusion:
Progressive volume deficits in hippocampal subfields in bipolar disorder were lateralised to the right hemisphere, unlike the bilateral subfield atrophy found in schizophrenia. These findings add to data that potentially clarify specific- versus cross-diagnostic neurobiological changes underlying psychotic spectrum disorders over time.

OP-AH-11

Going Beyond the Medical in Care Transition: A Review of the Effectiveness of the Aged Care Transition (ACTION) Programme in Tan Tock Seng Hospital

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Background & Hypothesis:
The Aged Care TransiTION (ACTION) team of care coordinators (CCs) help to ease transitions of elderly inpatients (aged 65 and above) with complex care issues back to the community and prevent their readmissions. The work of the CCs extends beyond caring for medical needs of patients. They also assess psychosocial needs of patients, social dynamics to identify appropriate caregivers and caregiver stress. CCs then conduct service-matching to appropriate community service providers to facilitate discharges. Within 30 days postdischarge, CCs conduct telephonic follow-ups and home visits to ensure that elderly patients and their caregivers are coping in the community. This project reviews the effectiveness of the ACTION programme in Tan Tock Seng Hospital (TTSH), using an elderly 30-day readmission rates as an indicator.

Methods:
Readmission data for elderly patients recruited by the TTSH ACTION team with interventions completed between January 2014 and December 2014 was extracted from hospital administrative data. Their 30-day readmission rates were compared with that of the 2014 elderly 30-day readmission rates of TTSH.

Results:
A total of 563 elderly patients were included in the study and 12.97% (73) were readmitted to TTSH within 30 days postdischarge. Results show that the 30-day readmission rate for elderly patients under the ACTION programme (12.95%) was 10.97% lower than that for TTSH elderly patients (18.19%) in 2014.

Discussion & Conclusion:
ACTION interventions were effective in reducing elderly readmissions. This suggests the pertinence of holistic assessments and care extending beyond medical aspects of a patient to that of his and his caregiver's psychosocial needs and dynamics in effective care transitions.

OP-AH-12

Non-Use of Day Care Services for Dementia in Singapore

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Background & Hypothesis:
Day care services for patients with dementia (PWD) are consistently underutilised worldwide despite evidence of positive outcomes. An earlier local study, employing quantitative statistics, unveiled factors for day care non-utilisation that accounted for less than one-quarter of the variance. Hence, this study sought to gain an in-depth understanding of factors associated with non-utilisation of day care services in Singapore with qualitative methodology.

Methods:
Purposive sampling was employed and semi-structured interviews with 16 caregivers of PWD who had never attended day care services were conducted. Interviews were audio recorded and transcribed verbatim. Data analysis was based on an Interpretative Phenomenological Analysis (IPA) framework.

Results:
Caregivers recognised the importance of engagement for PWD, yet were accepting of the patients' refusal to attend day care, which were based on negative opinions of day care and perceived abandonment by their families. Both caregivers and patients voiced concerns about the elementary level of the activities, and patients' ability to integrate into day care. Caregivers perceived a lack of need due to the availability of alternative care arrangements (e.g. having a domestic helper, adequate family support). Other service delivery issues (e.g. transportation, timing, environment) were also raised.

Discussion & Conclusion:
Culturally-bound caregiving values and perceptions underlie the decision not to use day care while inadequacies in service delivery compound the issue. Negative perceptions about services highlight the need to enhance the image and standards of day care and increase awareness of the benefits of day care for PWD beyond its custodial role.

OP-AH-13

Caregiver Burden and Quality of Life among Caregivers of Individuals with Mental Illnesses

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Background & Hypothesis:
Caregivers caring for individuals with mental disorders, often experience high levels of burden as these disorders are long lasting and unpredictable. The study aimed to establish the relationship between caregiver burden and health-related quality of life (HRQOL) among caregivers of individuals with mental illness.

Methods:
A total of 350 caregivers of outpatients with mental illness seeking treatment at the Institute of Mental Hospital were recruited through convenience sampling methods. The brief version of the World Health Organization Quality of Life instrument (WHOQOL-BREF) was used to assess QOL and caregiver's burden assessed based on the Perceived Stress Scale (PSS-10), General Anxiety Disorder (GAD-7) and Patient Health Questionnaire (PHQ-9) questionnaires. Analyses were performed using multiple linear regression model.

Results:
Mean age of the caregivers was 49.7 years (SD = 13.2), comprising largely of females (68%). Majority of respondents were 50 to 64 years old (45.6%), Chinese (57.6%), married (64.8%), had 'N'/'O' education level (24.7%), and were employed full time (50.6%). Caregivers who were students had significantly higher PSS scores compared to those who were employed, while caregivers with lower education (less than secondary level) had significantly higher PSS, GAD and PHQ scores compared to those with higher education. After adjusting for sociodemographic characteristics, higher PSS, GAD and PHQ scores were found to be significantly associated with low HRQOL in all domains (physical health, social relationships, psychological and environment).

Discussion & Conclusion:
Caregiver burden (PSS, GAD and PHQ scores) were found to be significantly associated with all domains of HRQOL. This finding reinforces the need for social support and psychoeducation to help caregivers cope with burden to ensure a better HRQOL for them.

OP-AH-14

Evaluation of Success Rate of Outpatient Smoking Cessation Clinic in Tan Tock Seng Hospital

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Background & Hypothesis:
There is a worrying increase in the prevalence of smoking in Singapore in recent years. To establish the impact of Tan Tock Seng Hospital (TTSH) outpatient smoking cessation clinic, we aim to evaluate the effectiveness of the outpatient smoking cessation clinic in TTSH. The primary objective of this study evaluated the quit rate of the outpatient smoking cessation clinic in TTSH while the secondary objective investigated the predictors affecting outpatient smoking cessation quit rate at 3, 6 and 12 months.

Methods:
This was a retrospective, non-randomised, non-blinded study involving 188 smokers. The study was conducted in TTSH using electronic patient records from the smoking cessation Microsoft Access database from 1 January 2008 to 31 December 2012. Independent t-test was employed to compare the mean between continuous variables. Chi-square test and Fisher's exact test were employed to analyse the categorical variables. Factors found to be statistically significant in univariate analysis were included in multivariate logistic regression model to determine if these factors were independent predictors of effective smoking cessation.

Results:
The quit rates for the outpatient smoking cessation programme at 3, 6 and 12 months were 15.4%, 15.4% and 13.2% respectively. Preferred quitting method, race and median number of quit attempt were found to be significant predictors.

Discussion & Conclusion:
The quit rates achieved by the TTSH outpatient smoking cessation service were comparable to previous years of studies. Employing significant predictors associated with smoking cessation, smoking cessation counsellors can tailor their counselling to meet smokers' needs and achieve better outcomes for smoking cessation.

OP-AH-15

Risk Factors for Methicillin-Resistant *Staphylococcus Aureus* Colonisation and Acquisition among Patients Admitted to the Communicable Disease Centre, Singapore: 2009 to 2014

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Background & Hypothesis:
Background methicillin-resistant *Staphylococcus aureus* (MRSA) has become the most commonly identified antibiotic-resistant pathogen worldwide.

Methods:
We conducted a retrospective review on patients admitted to the Communicable Disease Centre at Tan Tock Seng Hospital where an ongoing inpatient admission and discharge screening was done for MRSA.

Results:
From January 2009 to December 2014, a total of 9213 patient admissions were screened for MRSA. The prevalence rate at admission was 8.3% with the rate varied from month-to-month (mean: 9.1%; range, 4.7%-15%). Of those screened negative on admission, MRSA exit screening was done on 80% at discharge. Of these, 210 screening episodes (3.1%) were positive. Univariate analysis revealed that there was a higher risk of MRSA positive on admission in patients aged ≥65 years (OR: 3.37, 95% CI, 2.88-3.94), multidisciplinary ward with skin patients, and/or infectious disease patients (OR: 6.57, 95% CI, 1.62-26.65). Aged ≥65 (AOR: 3.35, 95% CI, 2.75-4.07) was the only independent predictor for MRSA colonisation on admission after adjusting for gender, HIV status and admitting wards. The duration of hospital stay was longer for patients who acquired MRSA during the hospital stay (median 7 days, IQR, 4-12) compared to patients who did not (median 4 days, IQR, 3-7) (OR: 1.02, 95% CI, 1.01-1.02. Aged ≥65 (AOR: 2.39, 95% CI, 1.69-3.39), LOS >7 (AOR 2.77, 95% CI, 2.01-3.81) were independent risk factors for MRSA acquisition after adjusting for gender, HIV status and admitting wards.

Discussion & Conclusion:
MRSA colonisation and acquisition rates remain high. This highlights the need to enhance and sustain infection control measures.

OP-AH-16

Types of Multidrug Resistant Organisms and Risk Factors for Mortality at a Large Adult Tertiary Care Hospital in Singapore, 2011 to 2013

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Background & Hypothesis:
Multidrug resistant organisms (MDROs) such as methicillin-resistant *Staphylococcus aureus* (MRSA), carbapenem-resistant *Enterobacteriaceae* (CRE) and vancomycin-resistant *Enterococci* (VRE), each has a significant impact on mortality.

Methods:
All MDRO clinical isolates from January 2011 through December 2013 were extracted from the hospital's infection control database.

Results:
A total of 22,460 clinical isolates were included in the study. Of these, 95% were MRSA, 1.7% CRE, 0.6% VRE and 2.6% were others including *Acinetobacter baumannii* and *Pseudomonas aeruginosa*. A total of 10,992 unique patient positive isolates for the first time during the study period were analysed. The study population was predominantly male (56%) and elderly (67.4% aged >65 years). Five percent had a Charlson Comorbidity Index (CCI) score >3, and 40% had LOS >14 days. There were 776 patients (7.1%) who died within 30 days of the clinical infection. On univariate analysis, CRE (OR: 2.1, 95% CI, 1.21-3.74), VRE (OR: 2.6, 95% CI, 1.27-5.30) and other MDROs (OR: 5.3, 95% CI, 4.00-7.03) were more likely to die within 30 days from the clinical infections. On multivariate analysis, male gender (adjusted OR: (AOR) 1.2, 95% CI, 1.01-1.36), age >65 years (AOR: 3.0, 95% CI, 2.41-3.59), CCI >3 (AOR: 2.3, 95% CI, 1.79-3.03) and non-MRSA infection (AOR: 4.8, 95% CI, 3.74-6.25) were independent risk factors for 30-day all-cause mortality, after adjusting for LOS.

Discussion & Conclusion:
MRSA is the most common cause of MDRO infections; however patients with non-MRSA infections were more likely to die within 30 days than those with MRSA. Further studies are required to better understand the reasons for this.

OP-AH-17

Predictors of Methicillin-Resistant *Staphylococcus Aureus* Nasal Carriage on Admission to a Tertiary Care Hospital in Singapore – A Case Control Study

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Background & Hypothesis:
Methicillin-resistant *Staphylococcus aureus* (MRSA) can cause a variety of clinical syndromes ranging from simple to life threatening infections.

Methods:
We conducted a case-control study on patients admitted between 1 January 2012 and 31 December 2013. The hospital practises universal MRSA screening via PCR on admission. Cases were inpatients screened to be MRSA-positive on admission, and controls were those screened to be MRSA-negative on admission.

Results:
A total of 46,691 patients were screened on admission during the study period. Among them, 2813 (6%) were positive for MRSA. The proportion of MRSA carriage was significantly higher in patients aged ≥65 years (P <0.001), with a Charlson's score >3 (P <0.001), and with history of MRSA colonisation or infection within the past year (P <0.001). On multivariable analysis, factors independently associated with MRSA carriage on admission were age ≥65 (AOR: 1.41, 95% CI, 1.29-1.53), chronic medical conditions of diabetes mellitus (AOR: 1.22, 95% CI, 1.07-1.39), renal disease (AOR: 1.56, 95% CI, 1.30-1.86) and prior history of MRSA (AOR: 16.54, 95% CI, 14.74-18.54), after adjusting for gender and other chronic medical conditions. MRSA carriage on admission (AOR: 1.40, 95% CI, 1.29-1.53) was positively associated with hospital stay >7 days, after adjusting for age, gender, Charlson's comorbidity score, and prior history of MRSA.

Discussion & Conclusion:
Prior MRSA colonisation or infection is the strongest predictor for MRSA nasal carriage on admission. Targeted on-admission screening of patients with MRSA colonisation/infection in the preceding year can be considered as an alternative to universal screening for MRSA prevention and control.

OP-AH-18

Hospital-Acquired and Community-Associated Methicillin-Resistant *Staphylococcus Aureus*: Are the Anatomical Colonisation Sites Different?

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Background & Hypothesis:
Hospital-acquired MRSA (HA-MRSA) and community-associated MRSA (CA-MRSA) differ in their epidemiology. Our study's objective was to compare the anatomical sites between HA-MRSA and CA-MRSA colonisation.

Methods:
We conducted a case-control study on patients admitted to the Communicable Disease Centre, from January 2009 to February 2012. Separate swabs were taken from patients' nares/axillae/groin (NAG), throat, and perianal areas for MRSA cultures. Sixty-two randomly selected patients with HA-MRSA colonisation (screened negative on-admission and positive predischarge) were compared with 56 randomly selected patients with CA-MRSA colonisation (positive on-admission).

Results:
Patients with HA-MRSA and CA-MRSA were similar in age ($P = 0.841$), nursing home residence status ($P = 0.750$), or Charlson's comorbidity score ($P = 0.481$). HA-MRSA patients however, were 4 times as likely to be tested positive on all screening anatomical sites (OR: 4.44, 95% CI, 2.02-9.78). On multivariable analysis, chronic disease of cerebrovascular disease (AOR: 0.24, 95% CI, 0.06-0.97) was negatively associated whilst testing positive on all screening sites (AOR: 5.94, 95% CI, 2.42-14.59) was positively associated HA-MRSA colonisation, after adjusting for age, gender, ethnicity, nursing home residence status, and history of prior hospitalisation. Additionally, after adjusting for potential confounding, patients with HA-MRSA were 4 times as likely as those with CA-MRSA to be colonised on all anatomical sites (AOR: 4.18, 95% CI, 1.78-9.81). In contrast, patients with HA-MRSA were 66% less likely to be only colonised at NAG sites (AOR: 0.34, 95% CI, 0.12-0.95).

Discussion & Conclusion:
Patients with HA-MRSA and CA-MRSA differed in colonisation sites, with HA-MRSA involving more sites than NAG. Besides antiseptic bathing, antiseptic mouth rinse should be considered for decolonisation of HA-MRSA.

OP-AH-19

Examining the Value of a Pharmacist's Involvement in a Home Care Team

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Background & Hypothesis:
The Virtual Hospital Service (VHS) in Tan Tock Seng Hospital aims to reduce hospital readmission through home visits, telephonic consults, and working closely with healthcare and social partners. The VHS consists of a multidisciplinary team of health managers (nurses), doctors and pharmacists. The value of a pharmacist's involvement in such a team is unknown, and is thus examined in this study.

Methods:
Patients are referred to pharmacists for medication reviews if appropriate. Patients recruited from 1 August 2012 till 31 March 2014 were included. Forms were reviewed retrospectively for drug-related problems (DRPs) detected (modified from Hepler and Strand 1990 definitions) and resolution rates. Acceptance rates of drug enquiries received and interventions made by pharmacists for non-referred cases were evaluated as well.

Results:
We included 41 patients, mean age 67.4 years, and 71% have 5 or more comorbidities. We reviewed 763 medications in all, of which 387 were chronic medications (mean: 18.6 medications/patient; 9.4 chronic medications/patient). A total of 500 DRPs were identified (mean: 12.2/patient), while 263 major DRPs were detected (mean: 6.4/patient). The top 3 major DRPs were failure to receive drug (44%), therapeutic duplication (13%) and untreated indication (10%). Overall resolution rates is 66.4%, (52.5% overall resolution rate for major DRPs). Drug enquiries recommendation and non-referred cases intervention acceptance rates were 73% (of 33 enquiries) and 54% (of 13 interventions) respectively.

Discussion & Conclusion:
Pharmacist involvement is important based on the scale of DRPs detected and need for drug-related knowledge, but a team-based approach is essential to improve resolution rates.

OP-AH-20

Relationship between the Schizotypal Personality Questionnaire (SPQ) and Social Cognition

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Background & Hypothesis:
Previous research has proposed that schizotypy might be indicative of a latent liability towards the development of psychosis and is manifest in varying degrees even among those with schizophrenia. Here we examined the relationship between varying levels of schizotypal traits measured by the Schizotypal Personality Questionnaire (SPQ) and various social cognitive tests. These traits are postulated to contribute to the social cognitive deficits expressed.

Methods:
Twenty-two subjects with schizophrenia from the Institute of Mental Health (IMH) completed the SPQ, and 10 different social cognitive tests. Results were analysed with respect to varying cutoff scores on the SPQ ranging from the 50th to 80th percentile, resulting in the formation of 2 groups for each analysis.

Results:
The domain of emotional processing as indexed by the BLERT and the TASIT was shown to be significant between groups. In particular, subjects showed deficits on the recognition of neutral faces. However, with the increase in SPQ cutoff scores, only the results on the BLERT (neutral) were consistent. The difference in classification of a neutral face was compared between groups ($P = 0.053$ at 80th percentile) and those with higher SPQ scores also exhibited greater misclassification of neutral faces as a negative emotion with P values tending to statistical significance ($P = 0.055$ at 80th percentile).

Discussion & Conclusion:
The results suggest that patients with higher SPQ scores tended to misclassify a neutral facial expression as a negative rather than a positive facial expression. This might be indicative of inherent differences between subjects that might have an impact on social functioning.

OP-AH-21

Effectiveness of Outpatient, Telephone and Home Nutrition Care Services for Postdischarge Malnourished Patients: A Randomised Controlled Trial

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Background & Hypothesis:
Malnutrition in hospital patients is prevalent, typically not reversed during admission and has adverse consequences. Traditional outpatient follow-up for nutrition care has poor attendance. This study evaluated the effectiveness of comprehensive outpatient nutrition services that comprise outpatient appointments, home visits and telephone support to treat malnourished patients postdischarge, compared with standard outpatient appointments.

Methods:
Malnourished adult patients discharged from a tertiary acute care hospital were randomly assigned to intervention (telephone follow-ups, outpatient appointments and/or home visits for non-attenders) or control (outpatient appointments) group. Nutrition status using the 7-point Subjective Global Assessment (SGA), weight and quality of life (QoL) were measured at discharge (baseline) and 5 months postdischarge. Survival up to 2 years postdischarge was tracked. General linear modelling was used to compare outcome measurements between both groups, controlling for medical specialties, age, gender, race and baseline measurements. Cox regression was used to obtain hazard ratio for mortality rate.

Results:
Fifty-six participants per arm (n = 112) completed the study. The intervention group showed greater improvement than the control group in nutrition status (79% improved vs 52%, $P = 0.002$), weight gain (2.3 ± 0.7 kg vs 1.0 ± 0.6 kg, $P = 0.04$) and QoL score (13.8 ± 3.9 vs 4.6 ± 3.7, $P = 0.02$). Mortality rate at 2 years postdischarge was reduced by half in the intervention group compared to the control group (16.7% vs 31.1%, adjusted HR = 0.42, $P = 0.041$).

Discussion & Conclusion:
Comprehensive postdischarge nutrition services for malnourished patients which include outpatient appointments and/or home visits and telephone support are more effective than standard outpatient appointments alone, and should be considered.

OP-AH-22

Use of Painless Laser Acupuncture (PLA) for Low Back Pain

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Background & Hypothesis:
Laser emits the purest form of light energy known as photons. Photons, when applied to the acupoints, some of its light energy will be absorbed by the cells to have tissue healing effect. This paper presents some of the case studies showing the effect of painless laser acupuncture (PLA) on patients who suffered from low back pain (LBP).

Methods:
Space laser SpA (Model IR CEB/UP, 904 nm, 10 watts peak power, average energy delivered 0.3 J/cm^2 per minute) was used. Depth of penetration is about 40 mm. Thor Ltd (Model DD, 810 nm, 200 mW, CW with output energy at 12 J/cm^2 per minute) was used. Depth of penetration is about 30 mm.

Results:
A 36-year-old male, who had acute low back problem for over a week, was given 6 PLA treatment sessions over a period of 2 weeks at 3 sessions per week. Another 40-year-old female patient who had been diagnosed by a medical doctor with slipped disc was in pain despite 15 years of chiropractic treatment. She was given a course of 10 PLA treatments over a period of 4 weeks. A 38-year-old female, who suffered from chronic LBP for about 8 months, received a similar 6 PLA treatment sessions over 2 weeks. All patients were free of pain after the treatments.

Discussion & Conclusion:
Laser produces a magnetic (YIN) and an electric (YANG) component which is perpendicular to each other and the characteristics fulfilled the principle of the classical acupuncture without the use of the needle and the Moxa roll. The benefits of PLA will be delineated in this presentation.

OP-AH-23

Pharmacist-Run Anticoagulation Clinic (ACC) Performance and Productivity Measures in Khoo Teck Puat Hospital (KTPH)

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Background & Hypothesis:
The KTPH ACC patient load has grown steadily due to increased referral rates. As part of a review of performance and productivity measures, we performed a study to characterise dose titration patterns and impact on patient outcomes.

Methods:
Patients seen in September 2014 were tracked for warfarin doses and international normalised ratio (INR) readings. Patients were stratified into 3 categories according to index INR values, namely subtherapeutic (SUB), therapeutic (TX) and supratherapeutic (SUPRA). These were further classified according to subsequent INR values post-titration. Percentage weekly dose changes, corresponding % INR changes (performance) and duration till next appointment (productivity) were measured.

Results:
Of 278 patients tracked, 148 (53.2%) were males with median age 69 years. Atrial fibrillation and venous thromboembolism were the most common indications for anticoagulation (64.4% and 20.1%). The distribution of INR categories was similar for both index and subsequent visits (SUB 30% to 35%, TX 50% to 55% and SUPRA 10% to 15% of patients studied). Of note, among index SUB patients, 52.6% remained as SUB after dose increase. For TX patients returning TX post-titration, the median appointment interval was 28.5 days which corresponds to the 1-month recommendation from our in-house titration protocol.

Discussion & Conclusion:
From this study, we affirmed that the in-house protocol recommendation for TX patients led to maintenance of INR within range. Approximately half of SUB patients remained SUB after dose increase, suggesting a cautious approach towards dose increases. Follow-up studies are underway to further characterise dose adjustment practices and correlate titration practice with percentage time-in-therapeutic range.

OP-AH-24

Clinical Outcomes in the Orthotic Management of Deformational Plagiocephaly

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Background & Hypothesis:
Management of deformational plagiocephaly is mainly by repositioning, and cranial orthotics (CO) are considered after 4 months. However, the appropriate timing of intervention according to severity is unclear. The treatment effect of CO will be investigated according to severity, and compared to repositioning.

Methods:
Retrospective data was collected from patients seen from 2013 to 2015. Measurements were done according to a validated and reliable protocol. Student's t-tests were done to compare different ages of treatment initiation according to severity, and between CO and repositioning.

Results:
Mean cranial vault asymmetry index (CVAI) decreased from 9.6% to 2.5%, with an overall 71% correction and 3.5 months treatment length (n = 34). At pretreatment, 2.9% of patients had normal CVAI, 17.6% mild, 52.9% moderate, and 26.5% severe. At post-treatment, 64.7% had normal CVAI, 35.3% mild, and 0% moderate and severe. Mild patients (61% correction; 2.8 months treatment duration) achieved significant correction ($P = 0.01$) if treatment was initiated before 7 months. Moderate patients (72% correction; 3.1 months treatment duration) achieved significantly shorter treatments ($P = 0.001$) if treatment was initiated before 6 months. No patterns were observed among severe patients (78% correction; 4.8 months treatment length). Repositioning (n = 8) achieved a significantly slower ($P = 0.03$) rate of correction compared to CO.

Discussion & Conclusion:
Most patients achieved normal CVAI, and none were moderate/severe, substantiating the effectiveness of CO. The initiation of CO for mild plagiocephaly could be delayed up to 7 months, and moderate cases up to 6 months, while less invasive treatments are trialled. However, the rate of correction of CO is faster than repositioning, if parents have difficulty keeping to repositioning regimes.

OP-AH-25

Nutritional Status, Weight Loss and Nutrition Support in Head and Neck Cancer Patients on Radiotherapy Treatment

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Background & Hypothesis:
Malnutrition in head and neck cancer (HNC) patients has been associated with poorer clinical outcomes. Clinically-significant weight loss (CWL) in HNC patients is an important indicator for malnutrition. There are limited data on the nutritional characteristics and support of HNC patients receiving radiotherapy treatment (RT) in Singapore. This study aimed to investigate the nutritional status, CWL and the nutrition support in HNC patients on RT.

Methods:
A retrospective review of 156 HNC patients, aged 57.7 ± 10.9 years, diagnosed between January 2012 and January 2014 was conducted. Patients were categorised into 2 groups: RT (n = 121) and non-RT (n = 35). Data on percentage weight loss post-treatment, baseline subjective global assessment (SGA) and type of enteral feeding were collected. Chi-square tests were used to analyse differences between groups.

Results:
A total of 73% (n = 88/121) patients on RT were referred to dietitian with their nutritional status assessed pretreatment. Fifty-four percent were malnourished. Post-treatment (mean duration 11.5 weeks), more patients who received RT experienced CWL of ≥5% than non-RT patients (70.4% vs 29.6%, P <0.01). No difference in prevalence of CWL were found between well nourished and malnourished patients (72.2% vs 61.9%, P = 0.34). Twenty-five percent of the patients on prophylactic enteral feeding had CWL vs 83% on interventional approach (P <0.01).

Discussion & Conclusion:
Malnutrition is highly prevalent in HNC patients on RT who are at high risks of CWL irrespective of their nutritional status. Prophylactic enteral feeding could be considered as part of a treatment protocol to reduce risk of CWL in these patients.

OP-AH-26

Association of Grip Strength, Upper Arm Circumference, and Waist Circumference among Older Adults with Dementia in Singapore

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Background & Hypothesis:
Studies have found that aging reduces handgrip strength, arm circumference and waist circumference. Reduced handgrip strength was also known to correlate with disability, morbidity and mortality. However, little is known about how these measurements are associated with dementia in older adults in Singapore. The present study aimed to examine the associations of the 3 anthropometric measurements with dementia among older adults who participated in the Well-being of the Singapore Elderly (WiSE) study in 2013.

Methods:
A single-phase cross-sectional population-based survey was conducted with a sample of 2565 men and women aged 60 years and above in Singapore. Data on sociodemographic correlates, dietary habits, health behaviours, grip strength, upper arm circumference, and waist circumference were collected. Dementia was diagnosed using the 10/66 dementia diagnostic criteria.

Results:
The mean grip strength was 12.5 kg (SE = 0.54) for people with dementia and 21.9 kg (SE = 0.26) for people without dementia. After adjusting for all factors, grip strength remained significantly associated with dementia (P <0.001). Upper arm circumference was associated with dementia (P <0.001) but this association was only significant in the univariate analysis. Waist circumference was not significantly associated with dementia.

Discussion & Conclusion:
Lower grip strength was independently associated with dementia in the older adult population in Singapore. Future research needs to be done to ascertain whether this association exists for specific types of dementia and look into the relationship of other anthropometric measurements with dementia in Singapore.

OP-AH-27

Motivations of Play in Online Gamers in Singapore

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Background & Hypothesis:
Escapism or using games to "relax, escape from real life and avoid real-life problems" is one of the key motivators for online gaming in people with Internet gaming addiction. There are 9 other motivations outlined by Yee (2006) to be the main reasons why gamers play online games. This study aimed to identify the predictors for game play motivations in Singaporean youths and explore the relationship between social phobia and game play motivations.

Methods:
A total of 737 participants aged 13 to 40 years old who played Massively Multiplayer Online Role Playing Games (MMORPGs) completed an online survey. The questionnaire included the game play motivations scale, sociodemographic questions and the Social Phobia Inventory (SPIN). Multiple linear regression was used to analyse the data.

Results:
Gender was a significant predictor for 8 motivations. Males were more motivated by achievement, mechanics, competition, socialising, relationship, role playing and escapism. Females were more motivated by teamwork. SPIN scores were significantly correlated to all motivations. High SPIN scores were associated with a higher score in all motivations (particularly escapism) except teamwork with which it was negatively correlated.

Discussion & Conclusion:
Although no one motivator was specifically associated with social phobia, it appears that those with higher levels of social phobia are more motivated to play online games than those without social anxiety. This has implications for the holistic treatment of those who play online games excessively as reducing social phobia may also help reduce motivation for game play and, therefore, reduce the urge or the time spent playing games.

OP-AH-28

Internalised Stigma among Patients with a Mental Illness

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Background & Hypothesis:
Stigma relating to mental illness is a global issue and often results from misunderstandings, negative stereotypes and perceptions society has about mental illness, frequently resulting in negative outcomes for people with mental illness. Internalised stigma specifically refers to the devaluation, shame, secrecy and withdrawal triggered by applying negative stereotypes to oneself. This study describes the correlates of internalised stigma among outpatients with schizophrenia-spectrum disorders, depressive disorders, anxiety disorders, and obsessive compulsive disorder (OCD).

Methods:
This was a cross-sectional survey among outpatients (n = 220) aged 21 to 65 years who were seeking treatment at the Institute of Mental Health or Community Wellness Clinics. Respondents were administered the Internalised Stigma of Mental Illness Scale, along with other measures and sociodemographic information was also obtained. Analyses were performed using one-way ANOVA and multiple linear regression models.

Results:
The majority of the sample was male (52.3%), single (58%) and currently working (52.3%). The mean age (SD) of respondents was 39.9 (11.1) years with more Chinese (45.4%) than Malays (27.3%) and Indians (27.3%). Internalised stigma was significantly lower among those with anxiety disorders compared to those with OCD (62.4 vs 72.9, $P <0.01$) and depressive disorders (62.4 vs 69.7, $P <0.01$). Multivariate analysis showed that sociodemographic correlates had no significant association with internalised stigma.

Discussion & Conclusion:
These findings highlight important disease-specific differences in internalised stigma among a group of treatment-seeking outpatients with mental illness. There is a need to identify and develop tailored interventions to reduce stigma particularly among those with depressive disorders and OCD.

OP-AH-29

Causal Attributions of Mental Illness Reported by Caregivers with Relatives Suffering from Mental Disorders

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Background & Hypothesis:
Caregivers' causal attributions about mental illnesses have important impacts on the care they seek for their kin and their burden of care. The current study examined causal attributions reported by caregivers of relatives with mental illnesses.

Methods:
This study was part of a survey examining burden and quality of life among caregivers (n = 350) of relatives with mental illness. A WHO attribution scale was used to examine possible causes attributed to mental illness by asking caregivers, "Can you please tell me what the doctors and anyone else involved with patient's care have told you is the matter with the patient?" Chi-square tests were used to examine the association between caregivers' causal attributions (biological, psychosocial, supernatural) and their kin's clinical diagnosis (early psychosis, chronic schizophrenia, mood, anxiety disorders, dementia).

Results:
A total of 64.5% of caregivers identified psychosocial causes as reasons for their relative's mental illness, 28.5% identified biological causes, and 17.4% cited supernatural causes. Caregivers significantly associated chronic schizophrenia with biological causes ($P = 0.003$). A significant relationship was noted between mood disorders and biological ($P = 0.002$) and psychosocial ($P = 0.025$) explanations of the illness. No significant association was found between causal attributions and early psychosis, anxiety disorders, or dementia.

Discussion & Conclusion:
More caregivers attributed the symptoms to biological rather than supernatural causes. While it is possible that caregivers had received some form of psychoeducation about their relative's illness resulting in awareness, cultural values may also have changed such that caregivers are more accepting of biological causes for symptoms, increasing their willingness to seek treatment and stay engaged with mental health professionals.

OP-AH-30

Positive Aspects of Caregiving among Caregivers of Older Adults

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Background & Hypothesis:
Caregiving of the elderly is traditionally viewed as a burden. Recently, there has been a growing interest in the positive aspects of caregiving. This study aims to examine the relationship of the positive aspects of caregiving of the elderly with sociodemographic factors and caregivers' burden.

Methods:
The participants (n = 98) comprised caregivers aged 21 to 65 years old who were providing care to at least one older adult aged 60 years and above with physical and mental illnesses (including dementia). Caregivers were recruited from the community and the Institute of Mental Health. Sociodemographic information was obtained and all participants were administered the positive aspects of caregiving scale (PAC) and the Zarit Burden Interview to assess positive caregiving experiences and caregivers' burden, respectively. The relationships between PAC total score, sociodemographic characteristics and caregivers' burden were investigated.

Results:
The majority (70.4%) of caregivers were aged between 40 to 65 years, females (65.3%), married (58.2%) and of Chinese ethnicity (57.1%). Mean PAC total score (SD) among the caregivers was 35.4 (6.9), with scores ranging from 9 to 45. The PAC total score was significantly higher among Indians (37.8) compared to the Chinese (33.7, P = 0.05). PAC and the Zarit Burden Interview scores were significantly and inversely correlated. Significantly lower burden scores were found among caregivers with higher PAC mean scores.

Discussion & Conclusion:
Caregivers do enjoy positive aspects of caregiving while taking care of their relatives. In the current study, these were associated with lower burden. Further studies are needed to investigate the beneficial impact of positive aspects of caregiving on outcomes in caregivers and older adults.

OP-AH-31

Association between Weight Gain and Lipid Profile Changes in First Episode Psychosis

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Background & Hypothesis:
Rapid weight gain and metabolic abnormalities have been reported in patients with first episode psychosis (FEP), but less is known about the relative trajectories between them. In this study, we examined and compared the time course of change in weight, BMI, and metabolic indices of FEP patients.

Methods:
Fifty-seven patients were enrolled in the study for a period of 1 year. Height and weight were taken at all 5 visits. Fasting blood samples were collected only at baseline, 3 months and 12 months.

Results:
BMI and weight in the first 3 months indicated an upward trend. At 1-month follow-up, patients showed significant mean increases in weight (M = 2.57, SD = 3.11) and BMI (M = 0.94, SD = 1.12). At 3 months, mean increases from baseline in weight (M = 3.82, SD = 5.21) and BMI (M = 1.42, SD = 1.93) continued to show significance. Clinically significant weight gain of ≥7% from baseline weight was observed in 22.2% of subjects at 1 month and 42.1% at 3 months. Regression analyses indicated that weight change in the first 3 months positively predicted change in LDL and cholesterol levels at 12 months.

Discussion & Conclusion:
The results suggest that weight gain is a problem in FEP patients and could be a useful predictor of worsening lipid profile at 12 months. This provides added impetus to monitor early weight gain and intervene earlier to prevent further changes in metabolic indices. Management for FEP should include lifestyle interventions focusing on diet and exercise early in the course of treatment. This may arrest or improve cardiometabolic risks in FEP patients.

OP-AH-32

The Use of Assessment Tool in Forensic Inpatient Setting to Provide Better Care for Patients

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Background & Hypothesis:
The need to enhance assessment of persons and to better recommend the relevant services for them in forensic psychiatry paved the way for this assessment tool—Alcohol Use Disorders Identification Test (AUDIT). This test is used primarily to identify persons with harmful and hazardous patterns of alcohol consumption. With this tool, it is also able to provide a framework for specific interventions to help harmful drinkers reduce or stop drinking.

Methods:
Data mining of patients from January 2014 to April 2015 was done and the results were processed using Microsoft Excel.

Results:
A total of 72 patients were administered AUDIT, of which 98% was predominately males. Racial profiling indicated that 16% was Malays, 32% Indians and the remaining were Chinese. Two-thirds of them are single, with the majority aged from 31 to 50 years old. There is a wide range of offences this forensic population is arrested for, with theft occupying one-quarter of the statistics.

Discussion & Conclusion:
An assessment tool such as AUDIT adds value to the work of an inpatient forensic case manager (CM). With the available statistics, CMs are able to provide suitable interventions tailored to the needs of an individual. The intensity level of psychoeducation and supportive counselling is better decided with the help of AUDIT too.

OP-AH-33

Perceived Severe Parental Physical Aggression Moderates the Relations of Narcissism and Aggression among Children with Disruptive Behavioural Disorders

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Background & Hypothesis:
Narcissism, which is an arrogant, grandiose presentation with concern of one's status over others, and parent-child conflict have been associated with aggression in children and adolescents. Furthermore, parent-child conflict significantly moderates the relationship between narcissism and aggression in children. This study sought to examine the potential moderating effect of parental physical aggression on the relationship between child's narcissism and aggression. It was hypothesised that severe parental physical aggression would significantly moderate the relationship between narcissism and aggression whereas mild parental physical aggression would not.

Methods:
A total of 282 children diagnosed with disruptive behavioural disorders (DBDs) were recruited. Narcissism in children was measured using the Antisocial Process Screening Device. Aggression levels in children were measured using the Reactive-Proactive Aggression Questionnaire. Frequency of parental physical aggression to child was measured by the Conflict Tactics Scale. All measures were children's reports.

Results:
Significant correlations were found between child's narcissism with both reactive and proactive aggression via bivariate correlational analyses. Linear regression analyses revealed that severe parental physical aggression significantly predicted a heightened risk of both reactive and proactive aggression among individuals with high narcissism.

Discussion & Conclusion:
Results suggest the importance of not overusing physical aggression to resolve conflicts especially when dealing with highly narcissistic children. This is to avoid exacerbating the already existing relationship between narcissism and aggression, especially when children and youths with DBD are already at risk for externalising behaviours such as aggression. Future studies could explore how children's reports corroborate with parents' in order to get a more accurate picture on the measures.

OP-AH-34

The Impact of a Monitored Dosage System on Medication Administration Time of Nurses in a Long-Term Care Facility

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Background & Hypothesis:
Monitored dosage systems (MDS) have been marketed to reduce nurses' medication administration time in healthcare institutions. As there is a paucity of local studies demonstrating its purported effect, we designed a study to assess impact of a MDS (Webstercare Flexipak®) on medication administration time in a local nursing home and to evaluate nurses' perspectives on its use.

Methods:
We observed nursing practices to define steps of the medication administration processes before and after implementation of Webstercare Flexipak®. Time-motion studies were used to time these steps. Nurses' perspectives on Webstercare Flexipak® were assessed via structured interviews.

Results:
All 7 nurses involved in medication administration participated in the study. Before implementation, the medication administration process comprised of 3 steps: packing, preparing and serving. Implementation of Webstercare Flexipak® reduced time spent on packing from 120 to 64 minutes. No significant difference was observed in time spent on serving (100 vs 97 minutes). Each nurse saved an average of 50.3 minutes/day (20.9% reduction in medication administration time). With Webstercare Flexipak®, nurses perceived an increase in medication administration time and decrease in convenience, but felt that it improved safety.

Discussion & Conclusion:
Error rates were not quantified in this study; thus the inability to assess impact of MDS on safety. Nurses' perceptions of longer medication administration time could be due to workflow changes, however, results obtained demonstrated otherwise. We conclude that MDS reduces medication administration time, mainly in the packing step. Further studies should be undertaken to examine impact of MDS on safety.

OP-AH-35

Molecular Epidemiology of Norovirus in Singapore, 2012 to 2015

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Background & Hypothesis:
Norovirus (*Caliciviridae* family) causes acute gastroenteritis worldwide. This study aims to investigate the molecular epidemiology of norovirus among infected patients and foodhandler-associated outbreaks in Singapore, between February 2012 and June 2015.

Methods:
A total of 115 norovirus positives were detected using real-time PCR (rPCR) at the National University Hospital. These were samples sent for clinical diagnosis (n = 20) and food-handler surveillance mounted during gastroenteritis outbreaks (n = 95). Partial *ORF2* gene was sequenced using Sanger sequencing. The clustering of the gene sequences were examined using a relaxed-clock, Bayesian MCMC method in the BEAST v1.8.0. The gene clustering was re-assessed using a maximum likelihood method in the PAUP*4.0b10. An optimal nucleotide substitution model was determined using the MODELTEST3.7 for each genogroup.

Results:
From the rPCR results, 75.65% (87/115) of the norovirus positives were GII, and 24.35% (28/115), GI. Of the 28 GI viruses, 25 were identified from 7 foodhandler-associated outbreaks and the remaining were from clinical patients. Of the 87 GII viruses, 72 were linked to 28 outbreaks; the remaining 15 were from clinical patients. Only 17 GI (derived from 3 outbreaks and 1 patient) and 16 GII (derived from 6 outbreaks and 6 patients) viruses were successfully sequenced. The 17 GI samples were confirmed as *GI.1*, *GI.2*, *GI.3*, *GI.6*, and *GI.9* strains. Among the 16 GII viruses, *GII.4* was the most common genotype (14/16), followed by *GII.1* and *GII.6* genotypes.

Discussion & Conclusion:
This study has shown that *GII.4* Sydney 2012 variant is the predominant strain circulating in Singapore from 2012 to 2015.

OP-AH-36

Outcomes of Patients with Total Knee Replacement (TKR) Following Physiotherapy Rehabilitation in a Tertiary Hospital in Singapore: A Retrospective Descriptive Study

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Background & Hypothesis:
There is an increase annual number of TKR patients who will potentially require rehabilitation to facilitate functional recovery. However, there is a lack of evidence-based clinical guidelines to guide physiotherapy rehabilitation. The study aims to evaluate the effectiveness of an evidence-based guideline for postacute TKR physiotherapy rehabilitation.

Methods:
A total of 122 patients who underwent unilateral elective TKR followed up in the physiotherapy outpatient service at TTSH from January 2014 to January 2015 were reviewed. Data retrieved and reviewed during initial and final outpatient physiotherapy assessment include: 1) pain measured on a visual analog scale (vas), 2) stair climbing ability, 3) ambulation ability, 4) knee range of motion, 5) quadricep muscle lag, and 6) modified squat ability.

Results:
The results showed significant improvements in all outcomes by discharge from outpatient physiotherapy ($P <0.01$). Seventy-six percent of patients reported pain improved to minimum or no pain on discharge while 64% and 34% of the patients demonstrated improved stair climbing ability ambulation ability, respectively. The mean active knee flexion and extension improved to 112.3 ± 12.6 and -2.7 ± 5.6 respectively. Fourty-eight percent of the patients improved to no quadriceps lag at discharge while 37% patients were able to perform modified squat independently. The number of sessions required for discharge from rehabilitation were 4.2 ± 2.9 sessions.

Discussion & Conclusion:
Postacute TKR physiotherapy rehabilitation based on evidence-based guideline is essential to help patients achieve reduced pain and improved quadriceps strength and functional outcomes post-TKR. Future study may evaluate the correlation of improved physical function with the patient actual return to work or premorbid function.

OP-AH-37

Perceptions of Affiliate Stigma and Quality of Life among Primary Caregivers of Patients with Mental Illness

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Background & Hypothesis:
Affiliated stigma refers to the extent of self-stigmatisation among caregivers who are associated with stigmatised patients with mental illness. It does not only affect the person with mental illness but also their primary caregivers. This study aimed to investigate the relationship between affiliate stigma and quality of life (QOL) among primary caregivers of relatives with mental illness under treatment at the Institute of Mental Health, Singapore.

Methods:
A cross-sectional study of 350 caregivers was conducted using an abbreviated version of World Health Organization Quality of Life questionnaire (WHOQOL-BREF) and a Family Stigma Scale (FSS). Multiple linear regression analyses were conducted.

Results:
The mean age of the caregivers was 49.7 years, majority of them were female (68%), Chinese (57.6%) and parents of patients (35.2%). The most endorsed item in the stigma scale was "You have helped other people to understand what it is like to have a family member with psychiatric problem" (62%); the least endorsed item was "You felt ashamed or embarrassed about it" (19%). After adjusting for sociodemographic correlates, results showed that caregivers experiencing more affiliate stigma had significantly poor QOL in all 4 domains; physical health (β = -0.248), psychological (β = -0.318), social relationship (β = -0.284) and environmental (β = -0.213).

Discussion & Conclusion:
A high proportion of caregivers or relatives of mental illness experience affiliate stigma in Singapore. All 4 QOL domains were significantly associated with affiliate stigma. These findings entail that it is imperative to improve public's perception of those with mental illness to reduce stigmatisation and thus improve caregiver's QOL.

OP-AH-38

Improving Patient's Attendance Compliance in Outpatient Clinic for New Cases Seen in Emergency Room with Intensive Case Management Intervention

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Background & Hypothesis:
New cases seen in the emergency room has low attendance rate in outpatient clinics without intensive case manager intervention. The study aimed to improve the attendance rate of new cases seen in emergency room in the outpatient clinic with case management intervention.

Methods:
Inclusive criteria: 1) new cases above the age of 17 years old; 2) registered under general psychiatry and psychogeriatrics; 3) not admitted to the ward; 4) give a follow-up appointment in an outpatient clinic to see consultants in general psychiatry (GP), psychogeriatrics (PSYCHOG), adult neurodevelopmental disorder services (ANDS), Early Psychosis Intervention Program (EPIP), Mood Disorder Unit (MDU) and National Addiction Management Service (NAMS); 5) cases assigned to ESCM. ESCM will provide a telephonic call within 24 to 48 hours postemergency room visit, to meet 4 objectives. Thereafter, ESCM will continue to monitor patient's progress and provide a subsequent telephonic call as needed, and another telephonic call prior to tcu date to remind patient of his/her appointment in the outpatient clinic.

Results:
A total of 95% of new cases actualised first TCU in the month of February 2015 versus 62% attendance in February 2014. A total of 93% of new cases actualised first tcu in the month of March 2015 vs 61% attendance in March 2014.

Discussion & Conclusion:
Case management intervention is crucial in building rapport and providing the support and linkage to patient postemergency room visit. It increases the chances of patients returning for their first review in the outpatient setting postemergency room visit.

OP-AH-39

Patient-Focused Offloading Options Help with Healing of Chronic Plantar Ulcers

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Background & Hypothesis:
Neuropathic plantar ulcerations are complicated by weight-bearing where healing is compromised with callus development and maceration. Complicated by diabetes and poor patient awareness, the ulcer often deteriorates and becomes chronic, increasing the risk of infection and amputation. We hypothesised that providing an offloading option that considered patients' lifestyle would increase the healing potential of chronic, complicated ulcers.

Methods:
Between April 2014 to May 2015, existing patients who presented with plantar ulcers whereby healing was taught to be compromised by weight-bearing were selected and tracked when offloading insoles and alternatives (total contact cast, footwear modifications and ankle-foot-orthoses) were administered during their reviews with podiatry. A biomechanical assessment and discussion amongst 2 podiatrists and the patient was done to decide the type of offloading option that would best offload ulcer and was suitable to the patient's lifestyle.

Results:
Out of 51 participants, 51% achieved full recovery from their complex wounds with a mean of 67 days. There was 57.03% mean reduction in wound area and 50.23% mean reduction in depth. A total of 94% of the cohort presented with diabetes mellitus with a mean BMI of 27.6 and mean age of 54 years.

Discussion & Conclusion:
Our findings suggest that an inclusive patient management plan in offloading complicated ulcers enhanced patient compliancy in using their devices and increased healing potential of these otherwise chronic ulcers.

OP-AH-40

Malnutrition Screening, Prevalence and Risk Factors in an Inpatient Stroke Rehabilitation Population

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Background & Hypothesis:
Malnutrition after stroke is prevalent and can lead to adverse outcomes. Detecting malnutrition with nutrition screening and identifying risk factors are important. The nutrition screening tool (NST) used in this study has not been validated in a stroke rehabilitation setting. Risk factors reported to be associated with malnutrition have yet to be studied locally. The study aimed to determine malnutrition prevalence, validate the NST in an inpatient stroke rehabilitation population and identify factors associated with malnutrition.

Methods:
Prospective study of 78 newly admitted stroke subjects, aged 64 ± 14 years, followed throughout their inpatient stroke rehabilitation stay was conducted. On admission, subjects were screened for malnutrition risk and assessed for nutritional status using the NST and subjective global assessment (SGA), respectively. Screening was repeated weekly for well nourished subjects and further assessed for nutritional status when at malnutrition risk. Data on factors potentially associated with malnutrition were collected. Receiver operating characteristic (ROC) curve analysis was used to determine diagnostic performance of the NS, compared against SGA. Chi-square test and 2-sample independent t-test were used for statistical evaluation of risk factors for malnutrition.

Results:
Malnutrition prevalence was 28%; 16% on admission and 14% during inpatient stay. The NST had area under the ROC curve, sensitivity, specificity, positive and negative predictive values of 0.846, 85%, 85%, 52% and 97%, respectively. Older age, lower weight and reduced nutrition intake were factors associated with malnutrition.

Discussion & Conclusion:
Malnutrition is prevalent in inpatient stroke rehabilitation. The NST is a valid screening tool with good diagnostic performance for detecting malnutrition in stroke rehabilitation population.

OP-AH-41

Utilising Nutrition Care Process Terminology to Evaluate the Effectiveness of Nutrition Care Provided by Dietitians in an Adult Acute Hospital Setting

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Background & Hypothesis:
The nutrition care process terminology (NCPT) is a systematic approach to providing high quality nutrition care practices and documentation. Electronic documentation utilising NCPT framework has been implemented by dietitians from an adult acute hospital setting. This study aimed to utilise NCPT framework to evaluate the effectiveness of nutrition care provided by dietitians.

Methods:
All inpatients with initial assessments completed by dietitians between 1 October 2013 and 31 March 2014 and requiring inpatient review assessment(s) were included in this study (n = 3392). Subjects were categorised into 2 groups: A) seen by dietitian prior to discharge (47%); B) not seen by dietitian prior to discharge (53%). Data on dietitian visits, nutrition diagnoses and nutrition monitoring and evaluation indicators were retrieved from electronic records. Chi-square test was conducted.

Results:
A total of 4512 diagnoses and 14240 indicators were yielded. The most common diagnosis used was inadequate enteral nutrition infusion (30%) followed by inadequate oral intake (24%) and most common indicator used was energy intake (36%) followed by protein intake (34%). The duration of nutrition care provided in group A was 17 ($\pm$32) days. Significantly higher proportion of diagnoses were evaluated as "resolved" (25% vs 7%) and "resolving" (36% vs 11%) in group A compared to group B ($P <0.01$). Nutritional goals were met for 56% of indicators in group A at review assessments compared to 20% met in group B ($P <0.01$).

Discussion & Conclusion:
NCPT framework allowed systematic evaluation of the effectiveness of nutrition care. This study demonstrated that nutrition care prior to discharge contributed towards resolving nutrition problems and achieving nutritional goals.

OP-AH-42

Strengthening Preventive Work to Improve Diabetes Care: A Healthcare Professionals' Perspective

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Background & Hypothesis:
Prevalence of diabetes in Singapore has risen over the years. Increasingly, patients living with diabetes who are at higher risk of developing diabetes complications are referred to tertiary hospital for management. The research aims to explore the views of healthcare professionals on patients' diabetes management and their quality of life.

Methods:
Semi-structured interviews were conducted with 14 healthcare professionals from a tertiary hospital, who worked with patients living with diabetes. Interviews were transcribed verbatim and themes were identified.

Results:
Interviewees emphasised the need to do preventive work at different levels of diabetes management. Prevention is vital to reduce the development of diabetes complications which can further decrease patients' quality of life. Diabetes education is highlighted as a key intervention method. At the individual level, interviewees highlighted the need to build up patients' social support network and strengthen their psychosocial well-being. The perceived need for patients' motivation and involvement in diabetes self-management may affect their quality of life. Intrinsic motivation is crucial towards good diabetes self-management. Guiding patients to seek meaning in life may better motivate them towards treatment adherence. Clinical integration of care is highlighted as another preventive strategy. The multidisciplinary team needs to collaborate to provide holistic diabetes care. At the macro level, closer collaboration with primary care will ensure a smooth transition of care and a strengthened after-care services when patients are discharged from tertiary care to primary care.

Discussion & Conclusion:
There is a need to focus on preventive strategies at multiple levels and psychosocial interventions to promote and enhance diabetes management.

OP-AH-43

Transformation of the Department of Care and Counselling in Tan Tock Seng Hospital

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Background & Hypothesis:
Social work, vital in the horizontal integration of health and social care, is necessary in ensuring sustainable healthcare in ageing high-income and middle-income societies. However, many social work departments in Singapore are constantly faced with high attrition, limiting their potential to come together and make a concerted effort at integrating health and social care. This workshop covers a 4-pronged approach adopted by the Department of Care and Counselling to transform itself into a viable instrument for the horizontal integration of health and social care.

Methods:
The 4-pronged approach includes: 1) drawing from the field of business management to develop strategic plans; 2) sharing cases of integration of health and social care with clinical heads of hospital; 3) investing in supervision that meets the staff values of dialogue, clarity, respect, equity, opportunities and quality of life; and 4) creating lean work processes.

Results:
Staff attrition in the Department of Care and Counselling has dropped 15.3% from 23.8% in FY 2011 to 8.5% in FY 2014. Comparison of results from employee climate surveys has also found marked improvement in the recent 5 years.

Discussion & Conclusion:
Transformation of the Department of Care and Counselling was a necessary first step towards creating a sustainable healthcare environment but it was a difficult and uncertain journey. This journey has taught the department that tough love and drawing knowledge outside the field of social work are needed to make difficult decisions to transform social work departments across the country.

OP-AH-44

Risk Factors for Falls in Community Stroke Survivors: A Systematic Review Protocol

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Background & Hypothesis:
Stroke is one of the major causes of long-term disability and main reasons for admission to community rehabilitation centres (CRCs) in Singapore. Stroke survivors have up to twice the risk of falling in first 6 months after discharge from hospital than general elderly population that could lead to greater deficits in daily activities, mobility function and community participation. Recent systematic review on fall prevention interventions for stroke survivors found little evidence on any effective fall prevention programme for this group. We will conduct comprehensive search for articles indexed on MEDLINE, EMBASE, CINAHL, PsychINFO, Cochrane Library, Web of Science databases that identify fall risk factors in community stroke survivors, and aim to develop a fall prevention programme for this group in local CRCs. Five independent reviewers will screen studies for eligibility, assess risk of bias and extract relevant data. Only studies with minimum quality rating will be included in the meta-analysis.

Methods:
Systematic review and meta-analysis.

Results:
Our protocol has been registered on PROSPERO 2015 (CRD42015023389).

Discussion & Conclusion:
This systematic review will provide knowledge of risk factors for falls specific to stroke and is the first phase of research project in developing a fall prevention programme for community stroke survivors in Singapore. Together with the input from various local stakeholders and international experts in falls and stroke rehabilitation, this new fall prevention programme will be piloted in local CRCs at a later stage, aims to test the feasibility of implementing the new programme in preventing falls and increasing community participation for larger group of stroke survivors in local CRCs.

OP-BSTR-01

Dual Optical Tweezers Stretching Technique for Assessment of Red Blood Cell Deformability in Diabetic Retinopathy

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Background & Hypothesis:
Haemorheological disturbances observed in diabetics have been postulated to play a role in the pathogenesis of diabetic microangiopathy. The present study was conducted to investigate factors affecting red blood cells (RBC) deformability and its role in diabetic retinopathy (DR) using a dual optical tweezers stretching technique.

Methods:
A pilot project was conducted after local ethics board approval. Blood from age-matched control and diabetic patients was collected for RBC deformability assessment using dual beam optical tweezers. A dual optical tweezers (2 separate trapping beams) was made by splitting and recombining a single Nd: YAG laser beam. RBC initial and final lengths after stretching were measured by digital video microscopy, and a deformability index (DI) was calculated.

Results:
Blood from 8 healthy controls with mean age of 52.4 years and 7 diabetic patients with mean age of 52.0 years was analysed. Initial average length of RBCs for control group was 8.48 μm (±0.25, 95CI: 8.03-9.25) and 8.82 μm (±0.32, 95CI: 8.03-9.62) for diabetic RBCs (P <0.001). DI was computed by dividing the difference between stretched and initial length of RBC with that of initial length of RBC. The DI for control group was 0.065 (±0.0224, 95CI: 0.016-0.131) and that for diabetic RBCs was 0.064 (±0.028, 95CI: 0.014-0.129) (P <0.001). DI was inversely related to basal length of RBCs (P = 0.02).

Discussion & Conclusion:
A dual optical tweezers method can be reliably used to assess RBC deformability. DI of RBC from diabetic retinopathy was significantly lower in comparison with normal healthy controls. DI was inversely related to initial length of RBC.

OP-BSTR-02

Development of a Novel Wound Dressing with Haemostatic and Antimicrobial Efficacy

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Background & Hypothesis:
Uncontrolled haemorrhage is the leading and second leading cause of mortality among combat casualties and civilian trauma patients respectively. Traumatic wounds are also susceptible to bacterial infection, which further complicates tissue injuries. Management of traumatic wounds involves the use of dressings with either haemostatic or antimicrobial properties, and dressings with both properties are currently unavailable. Hence, the development a wound dressing with these dual properties will significantly improve the survival rate.

Methods:
Formulations containing different concentrations of haemostatic and antimicrobial active ingredients were developed and in vitro whole blood clotting assay and antibacterial time-kill and zone of inhibition assays were performed to identify the most efficacious formulation. In vivo studies were evaluated in a swine femoral vein haemorrhage model and murine wound infection model to assess the efficacy and safety of the wound dressings.

Results:
The optimised wound dressing exhibited higher clotting rates than existing haemostatic dressings. Antimicrobial results also showed that this wound dressing exhibited significant bactericidal activity against common wound pathogens such as *Staphylococcus aureus* and *Pseudomonas aeruginosa*. A total of 99.9% reduction in bacteria numbers was achieved within 1 hour following bacterial inoculation, which was more effective than existing antimicrobial dressings.

Discussion & Conclusion:
A wound dressing with both haemostatic and antimicrobial properties has been developed. With its potent haemostatic and antimicrobial properties, this novel wound dressing may be more effective than current standards of care in overcoming both hemorrhage and bacterial infection associated with traumatic wounds.

OP-BSTR-03

Epidemiological and Immunological Factors Associated with Influenza Infection in Singapore in the Postpandemic Period

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Background & Hypothesis:
After the first wave of the 2009 influenza *A/H1N1* pandemic [*A(H1N1)*pdm09], there was a co-circulation of *A(H1N1)*pdm09, *H3N2* and influenza B viruses in Singapore. We investigated the incidence and risk factors for infection of these 3 strains in the postpandemic period, and possible evidence for heterotypic immunity.

Methods:
A cohort of 760 individuals contributed baseline demographic and household data and up to 4 blood samples each from 6 October 2009 to 27 September 2010, with vaccination history at each time point. We then investigated seroconversion to 3 subtypes in the intervals between consecutive samples by haemagglutination inhibition assays. A fourfold or greater increase in titer between consecutive serum samples was defined as serological evidence of infection after excluding observations in intervals where influenza vaccination occurred. Multivariate logistic regression with robust standard errors (to account for clustering) using person-interval as the unit of analysis was performed to identify associations between various study variables and seroconversion to each subtype.

Results:
Individuals with more household members aged less than 5 and 5-19 years had a higher risk of seroconversion to *H3N2* ($P = 0.005$; $P = 0.016$). Higher antibody titres to *A(H1N1)*pdm09 and *H3N2* at the start of each interval were protective against the same subtype ($P < 0.001$; $P = 0.009$), and previous infection with heterotypic influenza virus was associated with decreased odds of overall influenza infection (overall adjusted odds ratio 0.31, $P = 0.041$).

Discussion & Conclusion:
Our findings highlight the importance of antibody-mediated homotypic protection as well as heterotypic immunity, which may have implications for vaccination strategies and influenza epidemic and pandemic mitigation strategies.

OP-BSTR-04

Relative Hospitalisation Burden of Different Influenza Subtypes in Singapore in the Postpandemic Period

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Background & Hypothesis:
Following the first wave of the 2009 influenza *A/H1N1* pandemic [*A(H1N1)*pdm09], there was a co-circulation of *A(H1N1)*pdm09, *H3N2* and B in Singapore, which we used to investigate if incidence and relative severity of subtypes varied by age.

Methods:
We measured seroconversion to the 3 subtypes in 3 intervals by haemagglutination-inhibition assays in a cohort of 760 individuals in the postpandemic period. Adjusted hospitalisation-infection ratios were used to estimate disease severity in the community. Severities by age for each subtype were examined using Loess plots, and relative severities of subtypes by birth cohort were compared to detect any possible effect.

Results:
Loess plots revealed that *A(H1N1)*pdm09 severity peaked in those born around 1957, with lower severity in those born before and after 1957. In contrast, *H3N2* severity was least in youngest individuals, then increased till it surpassed *A(H1N1)*pdm09 in those born in 1952 or earlier. Since relative severity approximately reflected the emergence of *H2N2* and *H3N2* pandemic viruses in 1957 and 1968 respectively, we explored for possible birth cohort effects using these years: born in 1956 or earlier, born between 1957 and 1967, born in 1968 or later. Severity of *A(H1N1)*pdm09 was lower than *H3N2* in those born in 1956 or earlier (difference = -6.79, $P = 0.021$) and vice versa for those born in 1968 or later (difference = 2.97, $P < 0.001$), with no difference in those born between 1957 and 1967 (difference = -0.77, $P = 0.6325$).

Discussion & Conclusion:
These birth cohort effects support an "antigenic sin" phenomenon with the dominant circulating influenza subtype around the time of birth conferring long-term protection against severe disease.

OP-BSTR-05

A Case Report of HBV Virologic Breakthrough Despite Tenofovir-based Therapy and Adequately Suppressed HIV Viral Load in a HIV/HBV Co-Infected Patient

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Background & Hypothesis:
Ten percent of HIV-infected population has chronic hepatitis B infection. Managing hepatitis B in co-infected patients is challenging in view of the dual activity of several nucleoside analogues and emergence of antiviral drug associated S gene mutations (ADASMs). Previous studies had shown that long-term tenofovir monotherapy can maintain effective viral suppression.

Methods:
A 54-year-old gentleman with history of HIV/AIDS diagnosed since 1998 on 2nd line ART (AZT/3TC/LPV/r) was referred for Hbeag +ve hepatitis B with high viral load (HBV VL) (8.29 log) in December 2008.

Results:
HBV resistance testing revealed rtL80V, rtL180M and rt204V/I mutant sequences. Adefovir was added from February 2009 and switch to tenofovir containing regimen as HBV VL was 4.8log (April 2010) after 14 months of therapy. Initial HBV VL was suppressed to <1 log at 21 months. However, virologic breakthrough occurred as HBV VL was noted to be 3.47 log (October 2012) at 30 months of tenofovir-based therapy. Repeated HBV resistance testing on October 2012 showed co-existence of wildtype and similar mutant (rtL80V, rtL180M and rtM204) HBV polymerase gene sequences. Sequential add-on therapy with adefovir failed to achieve adequate suppression (8.13 log). Entecavir was added in place of adefovir at 44 months of tenofovir-based therapy (January 2014). The patient was compliant to the antivirals. Sustained HIV virologic suppression was achieved with TDF/FTC/LPV/r since 2012.

Discussion & Conclusion:
This case highlights the complexity and challenges in managing HIV/HBV co-infection. Mutation testing did not reveal rtA194T/rtA181T/rtN236. More studies will be required to determine molecular mechanisms and mutations for tenofovir resistance.

OP-BSTR-06

The Role of Sphingosine Kinase 1 in Cell-Cell Contact-Induced Neutrophil Activation

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Background & Hypothesis:
Available data suggest that neutrophils are one of the key players in the manifestation of many inflammatory diseases. Being in close proximity with T lymphocytes, direct cell-cell contact has been proposed to play an important role in the activation of neutrophils at the sites of inflammation. Neutrophil activation leads to several effector functions such as the production of pro-inflammatory cytokines, matrix metalloproteinases-9 (MMP-9), and degranulation, which contribute to the disease damage. SphK1, a key enzyme in the sphingolipid metabolic pathway, plays a critical role in angiogenesis, inflammation and various pathologic conditions. Previous studies have shown the pivotal role of sphingosine kinase1 (SphK1) in modulating the inflammatory response in rheumatoid arthritis (RA).

Methods:
We therefore examined SphK1 immuno-modulation in the context of T cell-neutrophil cell-cell interaction using 2 specific inhibitors, SphK12 and 5C.

Results:
Treatment with either inhibitor significantly reduced the levels of TNF, IL-1β and IL-8 in cell-contact assays using both Jurkat-perpherial blood (PB) neutrophils and synovial fluid T cells/PB neutrophils derived from RA patients. In addition, SphK12 and 5C also lowered production of MMP-9 in RA PB neutrophils upon contact with fixed, synovial fluid T cells. Finally, both inhibitors decreased the release of lactoferrrin, a surrogate marker of neutrophil degranulation, in similar contact assay.

Discussion & Conclusion:
Together, these data demonstrate SphK1 modulation may provide an additional approach in the treatment of RA as well as other chronic autoimmune conditions.

OP-BSTR-07

Time Division Multiplexing of Synthetic Gene Circuits

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Background & Hypothesis:
Synthetic gene circuits are engineered biological parts that can perform logical and control operations mimicking functions achievable in electronic circuits. Previous studies in synthetic biology have generated diverse biological modules such as switches, gates, oscillators and prey-predator systems that can modify cellular functions in various metabolic pathways. In order to build advanced structures of artificial biological systems, synthetic gene circuits need to be programmed to communicate with each other and function as a network. Hence, in this report, we aim to establish multi-communication capabilities in synthetic gene circuits through time-division multiplexing. The application of communicating biological circuits will subsequently, open up new frontiers to create robust mechanisms processing novel materials and chemical products.

Methods:
Initially, bio-circuit design methods are implemented to model the assembly of genetic components into synthetic circuits. Further, to achieve the desired mechanism, simulation tools are employed to guide the circuit design by selecting suitable parameters and genetically modifying the chemical kinetics.

Results:
The gene networks are also sequenced with time-control dynamics to enable time-dependent harvesting of synthetic proteins. Consequently, diverse synthetic networks that programme spatiotemporal transmission in multiple cell populations are programmed.

Discussion & Conclusion:
In conclusion, besides providing opportunities for new chemical process and drug development, communications control in synthetic networks will enable us to explore new pathways in dynamic gene regulation. The circuits may also offer insights on the underlying biological patterns and serve as a basis for novel applications in medicine, environment and bio-energy production.

OP-BSTR-08

The Correlation between Depression and Anxiety Symptoms on Suicide Ideation in Youths

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Background & Hypothesis:
Suicide ranks among the top 10 causes of death and is the third leading cause of death among youths worldwide. Suicidal ideation is the best predictor of suicidal behaviours. Previous researchers have strongly associated depression with suicidal ideation but little attention has been given to the role of anxiety and suicidal ideation. Also, anxiety is accompanied by worry, fear, repetitive thinking and individuals may seek escape by considering suicide. Thus, this study aimed to investigate the relationship between anxiety and depression symptoms on suicidal ideation.

Methods:
A total of 180 participants from Ngee Ann Polytechnic were recruited through convenience sampling. Participants completed self-reported measures of a quality of life inventory to measure the extent of depressive symptoms, anxiety symptoms and suicidal ideation, respectively. This study was approved by the human research ethics committee.

Results:
Results revealed increase in depression and anxiety symptoms each was positively associated with suicidal thoughts. Also, the results showed unique interactive effect that increase in both depression and anxiety symptoms conveyed additional risk to suicidal ideation.

Discussion & Conclusion:
This study provides evidence that depression and anxiety are risk factors for suicidal ideations. It further highlights that youths experiencing elevated anxiety and depressive symptoms are more prone to suicidal ideation as compared to those experiencing anxiety and depression independently. These imply that the evaluation for suicidal behaviour would be more complete when depression and anxiety are included in suicide risk assessments. Also, community interventions aimed at reducing suicidal behaviours should pay particular attention to individuals with elevations in both depression and anxiety symptoms.

OP-BSTR-09

Relationships among Social Support, Depression, Self-Efficacy and Health-Related Quality of Life in Patients with Coronary Heart Disease

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Background & Hypothesis:
Coronary heart disease (CHD) is increasingly prevalent in the world today. CHD patients often exhibit depressive symptoms and poorer health-related quality of life (HRQoL) as a result of the numerous lifestyle changes they have to undertake. Thus, identifying psychosocial factors that enhance HRQoL would contribute towards improving the health status of CHD patients. This study aims to explore the relative importance of different types of social support in predicting HRQoL, depression, and self-efficacy. In addition, this study is interested in understanding the mechanisms that underlie the direct relationship between social support and HRQoL.

Methods:
Seventy-four CHD patients were recruited through convenience sampling from Singapore Heart Foundation (SHF). Participants were asked to complete a battery of questionnaires that assessed perceived social support, cardiac self-efficacy, depression and HRQoL.

Results:
Positive interaction and emotional/informational support were found to be the most predictive of depression and self-efficacy respectively. No relationship was found between social support and HRQoL. Further, results suggest that the relationship between self-efficacy and HRQoL is mediated by depression, in which higher levels of depression is associated with poorer HRQoL.

Discussion & Conclusion:
Social support may indirectly influence HRQoL through its strong relationship with depression and self-efficacy. Healthcare planners may consider incorporating findings from this study into future planning, in order to provide more efficacious interventions to improve the HRQoL of CHD patients. Further, healthcare providers should pay special attention to patients exhibiting depressive symptoms and provide interventions to improve cardiac self-efficacy and alleviate depression, thereby enhancing their HRQoL.

OP-BSTR-10

Microfluidic Neutrophil Sorting and Advanced Phenotyping Shows Activated and Faster Rolling Neutrophils in Type 2 Diabetes Mellitus

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Background & Hypothesis:
Type 2 diabetes mellitus (T2DM) is associated with endothelial dysfunction (ED) and subsequent cardiovascular disease. Currently, the role of leukocytes in pathobiology of T2DM-related ED remains poorly understood. We aimed to isolate neutrophils and characterise neutrophil rolling speed (NRS) on the endothelium in T2DM patients and compare with healthy controls (HC).

Methods:
We recruited 7 T2DM patients and 2 HC. Neutrophils were purified from whole blood using a novel microfluidic device. Neutrophil activation was assessed by intracellular reactive-oxygen-species (ROS) and CD11b expression by flow-cytometry. NRS on E-selectin (adhesion molecule upregulated on endothelium during inflammation) was measured using microfluidics and image-processing under physiological flow conditions (2 dynecm^{-2}). Correlation analyses between NRS and non-HDL cholesterol, DM status and neutrophil activation markers were performed.

Results:
In T2DM, mean leukocyte count (per 10^5 RBCs) was higher (2029 ± 234 vs 937 ± 29 in HC; $P < 0.05$) and neutrophil activation markers were higher (ROS: 5138 ± 1217 vs 1944 ± 200; CD11b 443 ± 56 vs 398 ± 60 in HC). In T2DM, neutrophils rolled faster on E-selectin than HC (average NRS: 6.27 ± 0.26 vs 3.78 ± 0.04 in HC; $P < 0.01$) with a more heterogeneous velocity distribution. The NRS correlated with leukocyte activation markers (ROS, CD11b) and non-HDL cholesterol in T2DM patients ($P < 0.01$).

Discussion & Conclusion:
This pilot study demonstrates that in T2DM, the neutrophils have higher count, are more activated and have faster NRS on E-selectin. Further studies will help to elucidate the mechanisms responsible for this. This has the potential to be used as a novel functional biomarker for ED in T2DM.

OP-BSTR-11

Differential Metabolic Effects between High-Fat, High-Fat Supplemented with BCAAs and High-Carbohydrate Diet in Young Overweight Men: A Randomised Controlled Study

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Background & Hypothesis:
Epidemiological studies suggest that high protein intake increases the risk in developing diabetes mellitus. In obese mice, a high-fat diet (HFD) supplemented with branched-chain amino acids (BCAAs) induces insulin resistance despite lower weight gain compared to high-fat diet alone. Using controlled feeding protocol, we studied the metabolic effects of HFD with and without BCAA supplementation.

Methods:
We randomised 75 (age 27.5 ± 5.6years, BMI 26.1 ± 1.9kg/m^2) normoglycaemic male subjects to HFD, HFD with BCAAs (HFD + BCAA) and high-carbohydrate (HCD) diet for 2 weeks duration. Total daily calorie prescribed was 120% of the basal metabolic rate (derived from calorimetry) adjusted for physical activity. For HFD + BCAA group, 0.1g/kg/day of BCAAs in caplets were added. Insulin sensitivity (ISI-clamp) was measured using hyperinsulinemic euglycaemic clamp, adjusted for fat-free mass. All subjects underwent liquid mixed-meal tolerance test to determine postprandial insulin and glucose response. All these measurements were performed before and 2 weeks after diet intervention.

Results:
At 2 weeks postintervention, there was a significant increase in body weight and BMI across all diet groups. ISI-clamp decreased in all diet groups (HFD -0.27 ± 1.19, $P = 0.276$; HFD + BCAA -0.11 ± 1.33, $P = 0.672$; HCD -0.57 ± 1.35, $P = 0.049$). The area-under-the-curve (AUC) for glucose increased in HFD (12.2 + 115.6 mmol.min/L, $P = 0.603$) and HCD (57.66 ± 84.42 mmol.min/L, $P = 0.002$) groups. The AUC for insulin increased in HFD (2969.9 ± 6628.6 pmol.min/L, $P = 0.040$) and HCD (1947.2 ± 6321.36 pmol.min/L, $P = 0.137$) groups, but decreased in HFD + BCAA (-2550.3 ± 8109.9 pmol.min/L, $P = 0.111$) group.

Discussion & Conclusion:
A 2-week hypercaloric, high-fat and high-carbohydrate diet decreases insulin sensitivity and increases postprandial glucose and insulin responses. However, in the high-fat diet with BCAA supplementation, these metabolic responses are attenuated.

OP-BSTR-12

Comparison of the Theory of Planned Behaviour and Health Belief Model in Predicting Physical Activity among Cardiac Patients

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Background & Hypothesis:
Cardiovascular disease (CVD) is the leading cause of death globally, demanding preventative efforts to reduce its disease burden worldwide. Multiple health psychology theories for the promotion of preventive health behaviours exist in literature. However, studies often do not make empirical comparisons between models, resulting in confusion and a lack of consensus on their relative effectiveness and when in different contexts. The present study compared the predictive utility of the Theory of Planned Behaviour (TPB) with the Health Belief Model (HBM) on physical activity behaviour among cardiac patients in Singapore.

Methods:
Fifty-one patients participating in a community-based cardiac rehabilitation programme in Singapore completed questionnaires that assessed the components of 2 models (TPB and HBM) for physical activity behaviour. Age, gender, ethnicity, socioeconomic status and cardiac history were also recorded as background control variables.

Results:
In hierarchical multiple regression analysis, both the TPB and the HBM significantly predicted physical activity behaviour, accounting for 43.6% and 32.4% of variance respectively. Further analyses revealed that the strongest predictors of exercise behaviour were subjective norms (TPB), perceived behavioural control (TPB), perceived susceptibility (HBM) and perceived severity (HBM).

Discussion & Conclusion:
The current study suggests that the strongest predictors from each of the 2 models may be integrated to improve current efforts at promoting physical activity. An effective intervention may wish to emphasise how participating in physical activity is socially desirable (subjective norms), dependent on one's self-control (perceived behavioural control); as well as highlighting the high risk and consequences of CVD (perceived susceptibility and severity).

OP-BSTR-13

Use of a Mouse Model to Identify Behavioural Changes and Possible Mirna Gene Dysregulation Related to Parkinson's Disease

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Background & Hypothesis:
Parkinson's disease (PD) is a common degenerative disorder of the central nervous system usually manifesting in people above the age of 50. With Singapore's ageing population, we must brace ourselves to tackle the age-related problems that would arise. Early detection would prepare potential sufferers to battle the disease through medical intervention and improve quality of life in their golden years.

Methods:
One of the hallmarks of PD is the aggregation or increased levels of alpha-synuclein in the substantia nigra of the brain. Thus in this study, we conducted behavioural testing of both control and A53T-alpha-synuclein transgenic mice to identify the start of early movement abnormalities using the traditional beam test making use of 2 beams of widths 6 mm and 12 mm respectively at time points of 4th, 5th, 6th and 7th months. Results obtained unexpectedly showed increased locomotion activity of the transgenic mice to transverse both beams from the 5th towards the 7th month. Interval blood sampling was also carried out to quantify miRNA gene expression in order to establish a panel of biomarkers from 42 chosen miRNAs related to the expression of alpha-synuclein.

Results:
Results obtained via the beam test revealed hyperactivity in the transgenic mice despite the disease's progression. Dysregulation in several miRNAs was detected at 5, 6 and 7 months respectively between control and transgenic mice.

Discussion & Conclusion:
Following the transgenic mice over the last month before culling also revealed that these miRNA biomarkers could be clinically relevant to the progression of PD in humans.

OP-BSTR-14

Discovery and Validation of Prognostic Biomarker Models to Guide Triage among Adult Dengue Patients at Early Infection

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Background & Hypothesis:
The World Health Organization (WHO) recommended warning signs (WS) to stratify dengue patients at risk of severe disease. However, WS is limited in stratifying adult dengue patients at early infection for closer monitoring in hospitals to prevent severe dengue. The aim of this study is to develop and validate prognostic biomarkers models to stratify adult dengue patients who require closer monitoring at early infection.

Methods:
RNA microarray and protein assays were performed to identify differentially expressed biomarkers of severity at early infection between 47 patients with WS and hospitalisation (WS+Hosp), and 45 patients without WS and hospitalisation (non-WS + non-Hosp). Independent validation was conducted with 80 adult dengue patients. Prognostic models were developed based on forward stepwise and backward elimination estimation using multiple logistic regressions.

Results:
WS + Hosp group had significantly higher viral load, lower platelet and lymphocytes counts (all P <0.01) than the non-WS + non-Hosp group. The top single RNA and protein prognostic models were IP-10 protein (AUC: 0.74) and CCL8 RNA (AUC: 0.73), respectively. Model with CCL8, VPS13C RNA, uPAR protein, and model with CCL8, VPS13C RNA, platelet were the 2 optimal biomarker models with sensitivity and specificity up to 83% and 84%, respectively, in the discovery cohort, and up to 96% and 54.6%, respectively, in the independent validation cohort.

Discussion & Conclusion:
At early infection, adult dengue patients with WS and hospitalisation have significantly different pathophysiology compared with patients without WS and hospitalisation. These prognostic models can potentially complement the WHO 2009 WS to guide triage among adult dengue patients at early infection, after a larger study is performed.

OP-BSTR-15

The Role of GSTT2 in Modulating the Response to Mycobacterium Bovis, BCG In Bladder Cancer

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Background & Hypothesis:
Polymorphisms in GST family have been associated with response to BCG therapy. We hypothesise that Gluthathione-S-transferase theta 2 (GSTT2) have a role to play in modulating BCG response.

Methods:
GSTT2 silencing was done in MGH and overexpression was done in UMUC3 and U937 cells. Reactive oxygen species (ROS) were measured with 10µg/ml H2DCFDA and nitric oxide (NO) was detected using nitrite assay with Griess Reagent. BCG-induced cytotoxicity was analysed by cell counting and BCG survival detected by colony plating. GSTT2B deletion, which results in decreased GSTT2 expression, was analysed in a panel of human bladder cancer, macrophage cell lines and in a population of patient samples (n = 140) with age-matched controls.

Results:
A 2-hour BCG treatment of GSTT2-silenced MGH cells resulted in decreased ROS and conversely increased ROS in UMUC3 cells. When treated with BCG, there was no difference in cellular cytotoxicity whether GSTT2 was silenced or expressed. However, BCG survival increased when GSTT2 was silenced and decreased when expressed. In GSTT2-silenced MGH cells, NO production decreased after BCG treatment along with increased TNF-α production. For GSTT2 analysis, percentage of recurrence in patients with full length homozygous, heterozygous and deletion homozygous is 51.5%, 37.8% and 39.4% respectively.

Discussion & Conclusion:
GSTT2 expression in human bladder cancer and immune cells had an effect on ROS and BCG survival in the host cells. Given that BCG survival in macrophages is associated with differential immune outcomes, GSTT2 may be a newly identified protein that modulates the response to BCG.

OP-BSTR-16

Are Supplements Needed in the Diets of 3-Year-Old Children in Singapore?

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Background & Hypothesis:
Nutritional inadequacy is often a concern for parents. Supplement consumption is prevalent in the diets of children. This pilot study aims to investigate the necessity of supplements in their diets.

Methods:
Diets of 70 Chinese children were collected using 24-hour food recall, with weekday and weekend diets. Data collected include total weekly supplement consumption, the number and the types of supplements taken. The nutrient contribution of supplements to the diet was assessed and the diet with supplements was compared against dietary recommendations.

Results:
A total of 73.8% of subjects took supplements with 68.2% of them taking it on a daily basis. About 1 in 2 consumed more than 1 type of supplement. Cod liver oil was typically consumed (35.3%), followed by vitamin C (29.4%) and multivitamins (20.0%). There was no significant difference ($P > 0.184$) in the food intake between users and non-users of supplements in the sample. On average, the children's diet with supplements exceeded the RDA for vitamin A by 335.4%, vitamin C 209.1, vitamin D 12.2%, folate 24.7%, iron 152.2% and zinc 202.7%. The UL for vitamin A and zinc was exceeded by 117.7% and 29.7% respectively.

Discussion & Conclusion:
The average child is able to achieve recommended levels of nutrients from the diet alone, which includes fortified beverages such as growing-up milk. Excessive intake of nutrients may have unfavourable effects on the body over time. Caregivers should be encouraged to use food and beverages rather than rely on supplements to nourish their children.

OP-BSTR-17

What Are Our Children Eating? Analysis of the Diets of 3-Year-Old Children in Singapore

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Background & Hypothesis:
A pilot study was conducted as there is little local data on the diets of 3-year-old children.

Methods:
Diets of 70 Chinese children were collected using 24-hour food recall, with weekday and weekend diets. Food and drinks consumed were categorised into food groups and quantities consumed were compared against serving recommendations from HPB. Supplement intake was also assessed. Nutrient contribution of GUM to the diet was evaluated among GUM consumers. Modelling was performed to assess the replacement of GUM with unfortified whole milk (WM) and reduced-fat milk (RFM).

Results:
On average, children consumed 3.8 servings of rice and alternatives; fruit 0.8 serving; vegetables 0.5 serving; meat and alternatives 1.5 servings; and milk and alternatives 2.2 servings. GUM contributes 28.9% of calories, 24.9% protein, 26.7% carbohydrate and 36.6% fat to the diet. GUM accounts for 64.4% calcium, 56.6% vitamin D, 33.8% linoleic acid, 34.3% linolenic acid and 35.0% DHA. Compared to the WM diet, GUM diet supplied 43.9% more vitamin D, 19.8% more linoleic acid and more folate, iron and zinc ($P = 0.000$). Compared to the RFM diet, GUM diet contributed 48.4% more vitamin D, 33.8% more linoleic acid, 34.3% more linolenic acid and more folate, iron and zinc ($P = 0.000$). Compared to RFM and WM diets, GUM diet contributed 35.0% more DHA and 15.1% more lutein. A total of 73.8% of subjects took supplements with 68.2% of them taking it on a daily basis.

Discussion & Conclusion:
Diets of 3-year-old children in Singapore are not well balanced. GUM helps children meet nutrient recommendations better than WM and RFM.

OP-BSTR-18

Pathophysiology of Pruritus in Primary Localised Cutaneous Amyloidosis: A Thermosensory, Immuno-Histochemical and Human Leucocyte Antigen Genetic Study

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Background & Hypothesis:
Primary localised cutaneous amyloidosis (PLCA) is a chronic pruritic dermatosis, the pathophysiology of which is poorly understood. We aim to investigate if small fibre neuropathy, which comprises of a reduction in intra-epidermal nerve fibres (IENF) and abnormalities in quantitative sensory testing (QST), is present in PLCA.

Methods:
Twenty clinically- and histologically-diagnosed Chinese PLCA patients (10 females) were compared with 20 age-, ethnic- and sex-matched controls. QST was performed bilaterally on the skin at the upper back, lateral forearms and shins to determine the warm detection threshold (WDT) and heat pain threshold (HPT). Serum IL-31 and NGF were evaluated. Skin biopsy obtained from lesions were stained for: 1) IENF using antibodies to protein gene peptide (PGP) 9.5, tubulin beta-3 and neurofilament 200 (NF200), 2) IL-31 and its receptor (comprising subunits of OSMRÃŸ and IL-31RA), and 3) NGF and its receptor tyrosine-related kinase A (TkrA). Staining densities were compared to age-, gender, ethnic- and site-matched normal skin obtained from previously-stored paraffin-embedded specimens. The HLA-A and -B genes of our PLCA patients were also compared with that of 192 healthy randomly selected ethnic-matched controls.

Results:
WDT was significantly higher in PLCA patients at all sites and correlated with itch scores (r = 0.59; P <0.01). Skin biopsies revealed a significantly lower IENF counts in patients (P <0.001). Increased expression of the subunits of IL-31 receptor was observed in patients: OSMRÃŸ (P <0.001) and IL-31RA (P = 0.002).

Discussion & Conclusion:
The pathogenesis of itch in PLCA may involve a reduction in IENF and hypersensitivity of the remaining itch-transmitting nerve fibres, which is associated with an increased expression of IL-31 receptors.

OP-BSTR-19

A Mathematical Model for the Spread of *H5N1* Avian Influenza

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Background & Hypothesis:
H5N1 avian influenza has a high disease fatality rate of about 53.2%. Although culling of avians has been used as an intervention strategy, studies showed that countries may lose up to 0.4% of their gross domestic product due to this practice. A mathematical model for the spread of avian influenza and the culling of avians is proposed. This study aims to provide public health organisations with perspectives on reducing the number of infected humans while minimising the repercussions of intervention strategies.

Methods:
A compartmental model consisting of a system of ordinary differential equations that considers the interaction between avians and humans is used. A numerical method, namely Runge-Kutta of Order 4, is applied to solve the system. Least squares curve-fitting of model solution to data from Indonesia is used for parameter estimation.

Results:
In this study, the basic reproduction number of avian influenza was found to be 1.37. It is also found that modifying the culling measures every 9 months and every 6 months reduces the number of infected humans to approximately the same effect.

Discussion & Conclusion:
Both real and published data were used to validate the model. Surveillance on the spread of avian influenza among avians every 6 to 9 months to review the number of avians culled reduces the over-culling of avians while containing the spread. During an epidemic, there is available time for scientists to develop an appropriate medical vaccine since the culling of avians is effective in reducing the spread of avian influenza.

OP-BSTR-20

Developing and Content Validation of a Mental Model Elicitation Tool to Map Users' Decision and their Mental Model in Adopting the Clinical Decision Support System

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Background & Hypothesis:
The Wound Clinical Decision Support System (Wound CDSS), built in 2011, was considered the epitome in enabling the delivery of evidence-based wound management practices. Yet, its adoption rate was poor. This study aimed to develop and test the content validity of an elicitation tool that can provide understanding to the mental paradigm in decision-making towards the adoption of the CDSS.

Methods:
A mixed methodology was used with 2 study phases using a pluralistic framework. Phase 1 adopted the qualitative, descriptive research design to understand the nurses' thinking models. Phase 2 used a non-experimental, descriptive correlational design to develop and test the content validity of the elicitation tool.

Results:
Phase 1 identified 8 themes, namely, the use of Wound CDSS, the beliefs in the Wound CDSS, the workplace culture, the extent of benefits, control over practice, the use of knowledge, gut feelings and emotions. Phase 2 drew upon these themes to construct the items of the elicitation tool. Content validation was appraised by a panel of 8 experts in informatics or research. The items were edited or removed during analysis until all items reached the content validity index (iCV) of 0.8 or more and Fleiss Kappa (K) score of 0.6 or more.

Discussion & Conclusion:
Multiple iterative designs were made in this development study. Four items with borderline iCVs of 0.78 yet, with a (K) of more than 0.6 were retained in the final tool. The final elicitation tool has achieved a total iCV score of 0.93 and a (K) of 0.75.

OP-CR-01

Association between Testosterone Levels and Metabolic Syndrome in Obese Men

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Background & Hypothesis:
In general male population, testosterone levels negatively correlate with obesity and metabolic syndrome. It is not clear if these correlations are maintained in obese men. Our study investigated if in obese men, lower testosterone levels are associated with higher BMI, adverse glycaemic and lipid profiles, and higher blood pressure.

Methods:
Testosterone levels measured by immunoassay, anthropometric measurements, resting blood pressure, fasting plasma glucose (FPG), Hb1Ac, insulin resistance index (HOMA-IR), total cholesterol, triglycerides, and HDL/LDL ratio were analysed in 100 community-dwelling men with BMI >30 kg/m^2. Partial correlations and multiple regressions were used to estimate the associations between testosterone, BMI, glycaemic profiles, lipid profiles, and blood pressure.

Results:
In age-adjusted partial correlations, total and free testosterone were negatively correlated with BMI (r = -0.261 and -0.269 respectively, P <0.01). Total testosterone were negatively correlated with FPG (r = -0.208, P <0.05), but not with Hb1Ac or insulin resistance. The correlations persisted after adjusting for BMI. Total and free testosterone were not significantly correlated with lipids or blood pressure. In regression analyses, age and BMI were the most significant independent variables in the determination of Hb1Ac, insulin resistance, and lipid profiles (P <0.05).

Discussion & Conclusion:
Our results suggest that in obese men, lower testosterone levels modestly correlate with higher BMI and FPG. However, there is no significant correlation between low testosterone and adverse lipid profiles or blood pressure in obese men. Significant contributions of age and BMI to Hb1Ac, insulin resistance, and lipids suggest that in obese men, adiposity is more important than testosterone levels in the determination of insulin resistance and dyslipidaemia.

OP-CR-02

Choroidal Vascularity Index (CVI) – A Novel Optical Coherence Tomography Parameter for Monitoring Patients with Panuveitis?

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Background & Hypothesis:
We aimed to investigate the utility of volumetric data from EDI-OCT scans using custom image analysis software and compute choroidal vascularity index (CVI) using an image binarisation tool on EDI-OCT scans as a non-invasive optical tool to monitor progression in panuveitis.

Methods:
In this retrospective cohort study, EDI-OCT scans of both eyes in 19 patients with unilateral panuveitis were taken at baseline and at 3-month follow-up; they were segmented and compared with EDI-OCT scans of fellow normal eyes. Subfoveal choroidal area was segmented into luminal (LA) and stromal interstitial area (SA). Choroidal vascularity index (CVI) was defined as the proportion of LA to the total circumscribed subfoveal choroidal area (TCA).

Results:
The mean choroidal thickness was $265.5 \pm 100.15 \mu m$ at baseline and $278.4 \pm 102.65 \mu m$ at 3 months follow-up ($P = 0.06$). There was no statistically significant difference in TCA between study and control eyes ($P = 0.08$). CVI in the control group was 66.93 ± 1.51 at baseline and 66.39 ± 1.46 at follow-up. CVI was 74.06 ± 4.67 at baseline and 69.43 ± 4.83 for uveitic eyes at 3 months follow-up ($P < 0.001$). The percentage change in CVI was 0.062 ± 0.038 (0.043 to 0.080) for uveitic eyes which was significantly higher from % change in CVI for control eyes (0.007 ± 0.011, 0.002 to 0.013, $P < 0.001$).

Discussion & Conclusion:
The study reports composite OCT-derived parameters and CVI as a possible novel tool in monitoring progression in panuveitis. CVI and percentage change in CVI may be further validated in larger studies as a novel optical tool to quantify choroidal perfusion status.

OP-CR-03

Causes of Delay in Door-to-Balloon Time in Southeast Asian Patients Undergoing Primary Percutaneous Coronary Intervention for ST-Segment Elevation Myocardial Infarction

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Background & Hypothesis:
In the management of patients with STEMI, the timeliness of reperfusion is important. This is measured by the door-to-balloon (D2B) time. Current guidelines recommend a D2B of <90 minutes. System delays may reduce the mortality benefit of PPCI and reasons for delay can vary in different clinical settings. The aim is to identify the causes of delay.

Methods:
From January 2009 to December 2012, 1268 patients (86% male, mean age of 58 + 12 years) presented to our hospital for STEMI and underwent PPCI. Delay was defined as D2B >90 mins. We performed a key process analysis of our PPCI programme, assessed the relative contribution of individual time intervals on D2B and analysed the specific reasons for delay.

Results:
The median D2B for the overall study group was 60 mins and delay in D2B occurred in 16% of the patients (n = 204). The most common reason for delay in D2B time was delay in the emergency department (27.6%) followed by atypical clinical presentation (26.6%), unstable medical condition requiring stabilisation/CT imaging (19.2%), difficult PCI (9.4%), difficult vascular access (6.6%), consent issues (2.8%). The overall inhospital mortality was 5.6% and there was a trend towards a higher inhospital mortality for the delay group (8.4% vs 5%, $P = 0.06$).

Discussion & Conclusion:
Despite having an efficient system for STEMI care in Singapore, our registry showed that delay in D2B still occurred in 16% of our patients. Various interventions have since been implemented to improve this. Beyond this, factors such as symptom to perfusion time should be evaluated as well.

OP-CR-04

Epidemiology and Morphology of Middle Third Clavicle Fractures

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Background & Hypothesis:
We performed an observational study to review the epidemiology and early sequelae of mid-clavicular fractures.

Methods:
A total of 227 suitable subjects were enrolled from patients admitted to an emergency department with clavicular fractures in 2009-2010. Their radiographs were used to obtain measurements of fracture displacement and clavicular shortening.

Results:
The median age of patients presenting with mid-clavicular fracture was 30 years old. Road traffic accidents (59%) and falls (34.4%) were the more common mechanisms of injury with left being the more affected side (n = 119, 52.4%); 22% (n = 50) were Type 2A of Robinson's classification while the rest (88%) were at least of Type 2B1. The average shortening and displacement at presentation of mid-clavicular fractures were 8 mm and 9 mm respectively. The greatest postinjury shortening was an average of an additional 6 mm at 121-150 days from date of injury. There were 7 non-unions (3.6%) with a mean shortening and displacement of 11 mm and 10 mm respectively; 82.4% (n = 14) patients with initial fracture shortening of more than 2 cm achieved radiological fracture union. Seven of the 11 patients with initial fracture displacement of more than 2 cm underwent surgical fixation. Patients who underwent surgical fixation (n = 28, 14.4%) at median of 10 days postinjury. Their initial mean shortening and displacement were 10 mm and 12 mm respectively.

Discussion & Conclusion:
All types of mid-clavicular fractures treated conservatively continued to displace and shorten postinjury. The ideal algorithm for management of mid-clavicular fractures remains uncertain.

OP-CR-05

Neuropsychiatric Complexities in the HIV-Positive Patient – A Discussion of Three Challenging Cases and a Review of the Literature

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Background & Hypothesis:
Modern antiretroviral treatments have greatly improved the survival of patients with HIV. The spectrum of neuropsychiatric issues has also widened and the differential diagnoses are complex and varied, including primary psychiatric disorders, effects of HIV on the central nervous system, opportunistic infections, cognitive impairment, effects of non-HIV comorbidities and effects of pharmacology. Existing literature regarding neuropsychiatric diagnosis and management is reviewed.

Methods:
A series of 3 cases is discussed and the literature is reviewed.

Results:
Case 1: A 56-year-old Chinese male, HIV positive with a past history of epilepsy who presented with cognitive and functional decline over 6 months. This case illustrates the differential diagnoses and evaluation of a patient for HIV-associated neurocognitive disorder. Case 2: A 41-year-old Chinese male with a background history of bipolar disorder, diagnosed with HIV after he presented with disseminated tuberculosis and a lesion in the right cerebellum, and subsequently suffered a manic relapse. This case illustrates the differential diagnoses of mania in a newly diagnosed HIV-positive patient and the pharmacological considerations in management. Case 3: A 64-year-old Chinese male with HIV on stable antiretroviral treatment who suffered a severe traumatic brain injury. This case is used to discuss the combined effects of traumatic injury and HIV on the brain of an elderly person, as well as unique pharmacological considerations.

Discussion & Conclusion:
Current literature reveals an emphasis on neuropsychological testing and diagnosis, and to consider psychiatric differential diagnoses. However, the practical challenges in everyday practice where many patients are unable to undergo neuropsychological testing, are not addressed.

OP-CR-06

Differences in Clinical and Psychiatric Outcomes between Prevalent HIV-1 Molecular Subtypes in a Multiethnic Southeast Asian Sample

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Background & Hypothesis:
In Southeast Asia, subtype B and CRF01_AE are the prevalent HIV-1 subtypes. This study examines the inter-subtype differences in clinical indicators and psychiatric symptoms in a multiethnic sample.

Methods:
Study site was a national HIV treatment centre. Data were extracted from the Molecular Epidemiology Research Study and the HIV-Psychiatry Integrated Mental Health Project, and analysed according to groups defined by viral subtype.

Results:
Of 177 subjects, 54.8% were infected with subtype CRF01_AE; 42.9% screened positive on the HADS. The CRF01_AE group was significantly older (mean 38.29 years vs 34.62 years, $P = 0.031$) and had advanced immunosuppression (CD4 <200) just prior to HADS screening (33.0% vs 13.5%, $P = 0.003$). By multivariate logistic regression, homosexual transmission (OR 0.388, 95% CI 0.158-0.951, $P = 0.038$), subtype CRF01_AE (OR 2.898, 95% CI 1.199-7.001, $P = 0.018$) and positive HADS screening (OR 2.859, 95% CI 1.261-8.484, $P = 0.012$) were associated with advanced immunosuppression; and only advanced immunosuppression was associated with screening positive on the HADS (OR 3.270, 95% CI 1.299-8.227, $P = 0.012$).

Discussion & Conclusion:
Subtype CRF01_AE is associated with advanced immunosuppression but not with symptoms of anxiety and depression. The results suggest that psychiatric symptoms are associated with advanced HIV disease regardless of subtype.

OP-CR-07

Factors Associated with Prescription of Antibiotics for Upper Respiratory Tract Infections in the Private Primary Healthcare Sector in Singapore

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Background & Hypothesis:
Inappropriate prescription of antibiotics may select for antibiotic-resistant pathogens. We investigated patient and physician factors contributing to antibiotic prescription for upper respiratory tract infections (URTI).

Methods:
We recruited patients consulting at 35 private sector primary healthcare practitioners for URTI-related symptoms. Physicians and patients filled out separate questionnaires pertaining to antibiotic use and treatment-seeking behaviour towards URTI. Interviewers also verified if antibiotics were prescribed postconsultation. Physicians were intraconsultation asked about their perception of each patient's expectation for antibiotics. We investigated associations with antibiotic prescription using multilevel modelling.

Results:
Of 914 patients recruited, 19.1% received antibiotics. In multilevel multivariate analysis, 9 (8 patient and 1 physician level) factors were independently associated with antibiotic prescription at $P > 0.05$. Odds ratios and 95% confidence intervals (OR; 95% CI) for factors increasing antibiotic prescription included being sick for 5 or more days before consult (1.33; 1.11-1.61), perception that their illness was serious (2.61; 1.29-5.23), wanting antibiotics for their illness (2.3; 1.07-5.02), rejecting the statement that antibiotics had no side effects (2.46; 1.29-4.82), the physician perceiving that the patient wanted antibiotics (149.78; 68.09-370.61), patient expressing desire to go to another physician if not given antibiotics (5.03; 1.07-23.16) and being in a solo as opposed to a group practice (5.49; 1.15-27.88). Wanting medical leave as a reason for consultation (0.34; 0.17-0.67) and previously having given their antibiotics to family (0.10; 0.02-0.44) decreased antibiotic prescription.

Discussion & Conclusion:
Patients wanting antibiotics, and perception by doctors that the patient wanted antibiotics were significantly associated with increased antibiotic prescriptions, and could be potential points for intervention.

OP-CR-08

Comparison of Macular Choroidal Thicknesses from Swept-Source and Spectral-Domain Optical Coherence Tomography

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Background & Hypothesis:
Point choroidal thickness (CT) measurements are reported to differ between swept-source optical coherence tomography (SS-OCT) and spectral-domain OCT (SD-OCT). We aimed to assess the comparability of mean CT measurements between automated segmentations from the DRI OCT-1 (SS-OCT) and manual segmentations on the Spectralis OCT (SD-OCT) among healthy volunteers.

Methods:
In a prospective cohort study of 25 healthy volunteers, OCT scans were performed sequentially with the DRI OCT-1 and Spectralis using standardised imaging protocols. Mean central subfield CT was independently measured by masked reading-centre certified graders. Paired T-tests and intraclass correlation coefficients (ICCs) were used to compare the measurements.

Results:
The difference in mean central subfield CT measurements between DRI OCT-1 and Spectralis varied from 42.1µm to 67.2µm (P <0.001). After manual adjustment of the segmentation boundaries for the central subfield in the DRI OCT-1, the mean central subfield CT on DRI OCT-1 increased from 263.1µm to 293.3µm (P <0.001). The resultant difference between DRI OCT-1 and Spectralis decreased from 49.3µm to 19.1µm (a decrease of 61.3%). CT measurements between the 3D and radial scanning protocols of the DRI OCT-1 were also highly comparable, with differences generally under 10µm (P <0.001).

Discussion & Conclusion:
CT measurements between automated segmentations from the DRI OCT-1 and manual segmentations on the Spectralis OCT may differ by more than 50µm. This difference can be reduced, but not eliminated, by manual adjustment of segmentation boundaries by trained graders.

OP-CR-09

"Start to Finish Transinstitutional Transdisciplinary Care": A Novel Approach Improves Colorectal Surgical Outcomes in Elderly Patients

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Background & Hypothesis:
A transdisciplinary Geriatric Surgery Service (GSS) has produced consistent positive outcomes in our institution. We hypothesise that a transinstitutional transdisciplinary start to finish (STF) programme incorporating seamless prehabilitation and rehabilitation will further improve outcomes.

Methods:
Patients who underwent major colorectal resection in Khoo Teck Puat Hospital and managed under the GSS from January 2007 to December 2014 were included in this prospective study. The STF programme was initiated from January 2012 and patients >65 years were included. The surgical outcomes of patients managed under the GSS before the initiation of STF were compared to the outcomes after the implementation.

Results:
There were 57 patients after the initiation of STF programme compared to 60 patients managed before STF. There were 26.4% versus 25% of frail cases in the STF group compared to the non-STF group respectively, $P = 0.874$. Mean length of hospital stay was reduced significantly in the STF group, from 11.0 to 8.4 days, $P = 0.029$. Clavian 3 and above complications were reduced from 8.3% in the non-STF group to 5.3% in the STF group, $P = 0.511$. Functional recovery at 6 weeks was improved in the elective STF group who received prehabilitation compared to the elective non-STF group who did not receive prehabilitation, 100% (46/46) versus 95.7% (45/47) respectively, $P = 0.157$. There were no significant differences in 30-day mortality between the 2 groups.

Discussion & Conclusion:
Through a transinstitutional transdisciplinary approach, we achieved significantly shorter hospital stays. All elective patients who received prehabilitation achieved full functional recovery.

OP-CR-10

Sleep Disturbances in Patients with Primary Glaucoma

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Background & Hypothesis:
Melanopsin retinal ganglion cells (RGC) in the eye have been found to be an important part of the regulation of diurnal rhythms in humans such as sleep. These cells may also be damaged in primary glaucoma. This study aims to investigate the impact of primary glaucoma (primary open angle glaucoma (POAG) and primary angle closure glaucoma (PACG)) on sleep quality (SQ) and excessive daytime sleepiness (EDS) of patients.

Methods:
This is a prospective, case-control study. Subjects were recruited from a tertiary ophthalmology centre. Validated questionnaires, Pittsburgh Sleep Quality Index (PSQI) and Epsworth Sleepiness Scale (ESS) were administered. The Patient Health Questionnaire 2 (PHQ-2) was used to screen for depression, a possible confounder. Clinical and demographic subject data was collected. Severity of glaucoma was based on Humphrey Visual Field (HVF) 24-2 perimetry results. Differences in frequencies of poor SQ (PSQI score >5) and EDS (ESS scores) were assessed between cases and controls. Associations between PSQI and ESS and HVF results, and visual acuity (VA) were analysed.

Results:
A total of 79 POAG, 27 PACG patients and 89 controls were recruited. Using logistic regression analysis, a PACG patient is 3.41 times more likely to have poor sleep quality (95% C.I 1.37-8.47) compared to controls, having adjusted for age and gender ($P = 0.008$). A patient with VA 6/60 or worse in the worse eye is 5.59 times more likely to suffer from poor sleep quality compared to VA 6/12 or better, having adjusted for control/POAG/PACG groupings (95% CI 1.24-25.2, $P = 0.025$).

Discussion & Conclusion:
Primary glaucoma was associated with poor SQ but not EDS. Poor SQ was associated with worse VA and type of glaucoma (PACG).

OP-CR-11

Clarifying Relationship between Chronicity of Schizophrenia and Severity of Cognitive Deficits: Persistent or Progressive?

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Background & Hypothesis:
Cognitive deficits in patients with schizophrenia are associated with poor psychosocial functioning. Prior studies produced mixed findings on the relationship between chronicity of schizophrenia and severity of cognitive deficits. To examine this relationship, we hypothesised that 160 patients with chronic schizophrenia (CS) would have greater cognitive deficits than patients with first-episode schizophrenia (FES).

Methods:
A total of 199 subjects (84 FES, 47 CS and 68 healthy controls (HC)) were assessed on cognitive functioning using Brief Assessment of Cognition in Schizophrenia (BACS). ANCOVA analyses were conducted to compare cognitive functioning amongst all 3 groups, controlling for age, gender, employment status, years of education and Wide Range Achievement Test 3 (WRAT3) scores. Between-group differences were probed for using posthoc Bonferroni-adjusted t-tests.

Results:
ANCOVA analyses demonstrated that HC performed significantly better than CS and FES in verbal memory, motor speed, semantic fluency, attention and processing speed, and overall BACS score ($P \leq 0.001$ for all except semantic fluency – $P \leq 0.01$). Greater impairment in verbal memory was also found in CS than FES ($P \leq 0.01$). Subsequent ANCOVA controlling for an additional PANSS negative subscale score revealed no significant difference between FES and CS across all components of BACS.

Discussion & Conclusion:
Chronicity of schizophrenia is not associated with worse cognitive deficits, highlighting persistent and sinister cognitive deficits which warrant early evaluation in the trajectory of illness. Exploring better means to ameliorate these cognitive deficits which can affect psychosocial functioning is warranted.

OP-CR-12

Erythema Induratum: A Case Series from a Tertiary Referral Centre in Singapore

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Background & Hypothesis:
The aim of this study was to characterise the nature of erythema induratum in Singapore.

Methods:
Case notes of patients diagnosed with erythema induratum at National Skin Centre's Cutaneous Infection clinic from 2009 to 2015 were retrospectively reviewed.

Results:
A total of 7 patients were identified. They were aged between 28-80 years old at presentation. A female preponderance (6:1) was noted. There were 5 Chinese and 2 Malay patients. All patients presented with tender erythematous nodules on their legs. Lobular panniculitis with vasculitis was noted on all biopsies of lesional skin. Ziehl-Neelsen stain and tuberculosis cultures of skin biopsies were all negative. However, T-SPOT® TB test was positive in all patients. Three patients had exposure to tuberculosis contacts and 1 patient was diagnosed with pulmonary tuberculosis. All patients were commenced on a standard antituberculous regimen. In 5 patients, the lesions resolved with no recurrences. One patient had a recurrence which responded to a second course of antituberculosis treatment. One patient was unable to complete therapy due to drug hypersensitivity syndrome and had 4 recurrences over a 5-year period.

Discussion & Conclusion:
The epidemiological and clinicopathological features noted correlate well with published data. No validated criteria exist to diagnose erythema induratum. This study suggests that if clinicopathological features suggest erythema induratum, T-SPOT® TB test is a useful adjunct to aid diagnosis and predict response to antituberculosis medication. A diagnosis of erythema induratum should prompt a search for extra-cutaneous tuberculosis.

OP-CR-13

Outpatient Urokinase Treatment of Dysfunctional Dialysis Catheters and the Impact on Patency and Hospitalisations

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Background & Hypothesis:
Intra-catheter thrombosis causes dysfunction in cuffed tunneled dialysis catheters. At our centre, an outpatient clinic treats patients referred for catheter dysfunction, with intra-catheter urokinase. This study aimed to determine the effectiveness of this and factors influencing outcome.

Methods:
A total of 51 haemodialysis patients (mean age 61 years, 64% females) with a total of 69 outpatient visits, were treated from November 2011-March 2014. A haemodialysis-trained nurse confirms poor flow, then urokinase 6000 units/ml is instilled to both catheter lumens. Treatment success was defined as catheter patency for 3 months.

Results:
Adequate blood flow during the next haemodialysis session was established in 42/69 (61%) cases; 12/69 cases (17%) had sustained catheter patency for 3 months; 53/69 (77%) required repeat urokinase treatment or catheter change, with catheter patency extended by a mean 18 days, from the initial treatment; 2/69 cases (3%) began utilising arteriovenous fistulae; 2/69 cases (3%) changed catheter, but not for dysfunction (sepsis and extrusion). Of 17 cases requiring repeat urokinase treatment, 7/16 (44%) that needed 1 further treatment and the single case requiring 2 further treatments, avoided catheter change at 3 months. No factors, including urokinase dwell time, catheter type (palindrome or non-palindrome) and anatomical location of catheter, significantly affected treatment success, hospitalisations for dysfunctional catheter, or time to repeat treatment or catheter change.

Discussion & Conclusion:
Outpatient administration of intra-catheter urokinase to dysfunctional cuffed tunneled dialysis catheters, may reduce need for hospitalisations and catheter change. Further study, comparing our study patients with those admitted directly to the ward, additionally looking at cost and wait-times, would be useful.

OP-CR-14

Epidemiology and Risk Factors for Co-Colonisation of Multidrug-Resistant Organisms

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Background & Hypothesis:
Methicillin-resistant *Staphylococcus aureus* (MRSA), vancomycin-resistant *Enterococcus* (VRE), and carbapenem-resistant *Enterobacteriaceae* (CRE) are increasing in acute hospitals. Co-colonisation by these organisms can result in higher morbidity, but risk factors for co-colonisation are poorly understood. We evaluated factors associated with co-colonisation of MRSA, VRE, and CRE.

Methods:
We conducted a cross-sectional study at Tan Tock Seng Hospital, 12 June-9 July 2014. Patients with >48 hours' stay were screened for MRSA via nasal, axillary, and groin swabs, and for VRE and CRE via rectal swabs/stool. Epidemiologic data were collected and associations with co-colonisation compared. To control for potential confounding, multivariable logistic regression models were constructed.

Results:
Of 992 patients screened, 41 (4.1%) were co-colonised with MRSA and VRE, of whom 2 were also co-colonised with CRE. Four were co-colonised with VRE and CRE. Sub-acute (5%) and acute (4.1%) wards had more patients with MRSA-VRE co-colonisation than intensive care units (1.9%). After adjusting for age and care unit type, males (OR 2.2; 95% CI 1.1-4.4; *P* = 0.0322), prior admission within 1 year (OR 2.8; 95% CI 1.3-5.8; *P* = 0.0066), and >7 days of hospitalisation (OR 6.7; 95% CI 2.0-22.2; *P* = 0.0020) were positively associated with MRSA-VRE co-colonisation. The same factors were not found to be associated with MRSA-CRE and VRE-CRE co-colonisation.

Discussion & Conclusion:
MRSA-VRE co-colonisation appears to be related to exposure to hospital environments, with patients having prior admissions and >7 days of hospitalisation being at higher risk. Appropriate precautions should be instituted to prevent co-colonisation. Further studies are needed to better understand risks for CRE colonisation and CRE co-colonisation with MRSA and VRE.

OP-CR-15

Antibiotic Computerised Decision Support System Does Not Increase 30-Day Readmission: A Cohort Study

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Background & Hypothesis:
Antibiotic computerised decision support systems (CDSSs) have been shown to improve antibiotic prescribing, but evidence of their effects on patient outcomes is limited. We evaluated the impact of an antibiotic CDSS on hospital readmission, as a surrogate for infection non-resolution.

Methods:
All patients admitted to Tan Tock Seng Hospital, 1 October 2011-30 September 2012, and prescribed piperacillin-tazobactam or carbapenem for empiric therapy and auto-triggered into the in-house CDSS to receive antibiotic recommendations, were included in the cohort study. Propensity-score adjusted multivariable multilevel logistic regression models were constructed, to control for potential confounding and account for clustering of patients within prescribing physicians.

Results:
One-quarter of 1886 eligible inpatients received CDSS-recommended antibiotics. Among 1492 patients discharged from hospital, 25% and 11.2% were readmitted within 30 days for all causes and infection-related causes respectively. On multivariable analysis, patients aged >65 years were more likely than those aged ≤65 to be readmitted for all-causes (OR 1.56, 95% CI 1.13-2.14, *P* = 0.0066) and infection-related causes (OR 2.21, 95% CI 1.34-3.64, *P* = 0.0018) within 30 days of hospital discharge. No increase in 30-day all-cause readmission (OR 1.13, 95% CI 0.64-1.99, *P* = 0.68) and infection-related readmission (OR 1.16, 95% CI 0.48-2.79, *P* = 0.74) was observed in patients who received antibiotics recommended by the CDSS, compared to those who did not.

Discussion & Conclusion:
Receipt of antibiotic CDSS recommendations did not increase 30-day all-cause and infection-related readmissions. Physicians should be reassured of the non-increase in the non-resolution of infections among patients who received CDSS-recommended antibiotics to increase their acceptance of CDSS and their antibiotic recommendations.

OP-CR-16

Acceptance of Recommendations by Computerised Decision Support System for Antibiotic Guidance: A Cohort Study

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Background & Hypothesis:
Computerised decision support systems (CDSSs) have been developed to improve antibiotic decision-making and enhance antimicrobial stewardship. We examined factors for physicians' acceptance of antibiotic recommendations by CDSS for guidance on empiric, prophylactic, or definitive therapy, or for renal dose adjustment.

Methods:
We conducted a cohort study in Tan Tock Seng Hospital, and included all inpatients with electronic prescriptions seeking antibiotic CDSS guidance, 1 May 2011-30 April 2013. To control for confounding, multivariable logistic regression models were constructed.

Results:
Majority (83%) of antibiotic recommendations for 8379 prescriptions that sought CDSS guidance were accepted. Mean age was 71.5 (SD 16.5) years and 53% were males. After adjusting for potential confounding, prescriptions from medical specialties (adjusted odds ratio [aOR] 1.20, 95% CI 1.04-1.37) and made during on-call hours (aOR 1.81, 95% CI 1.61-2.05) were positively associated with acceptance. CDSS recommendations for guidance on renal dose adjustment (aOR 18.94, 95% CI 14.71-24.38) and empiric therapy (aOR 1.19, 95% CI 1.04-1.34) were more likely to be accepted than definitive therapy. For empiric and definitive therapies, prescriptions from medical specialties (aOR 1.37, 95% CI 1.18-1.59) and made during on-call hours (aOR 1.90, 95% CI 1.68-2.15) were positively associated with acceptance. Compared to pneumonia, CDSS-recommended antibiotics for treatment of sepsis were half as likely to be accepted (aOR 0.51, 95% CI 0.40-0.63).

Discussion & Conclusion:
Physicians' acceptance of CDSS recommendations was higher for guidance on renal dose adjustment and empiric therapy than for definitive therapy, and during on-call hours. CDSS could be enhanced to support sepsis management.

OP-CR-17

Why Don't Healthcare Staff Wash their Hands?

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Background & Hypothesis:
Hand hygiene (HH) prevents healthcare-associated infections, but compliance among healthcare staff is suboptimal. We evaluated healthcare staff's perceptions and attitudes toward HH, and explored psychosocial factors associated with HH compliance in routine patient care.

Methods:
We conducted a mixed-methods study in Tan Tock Seng Hospital. Focus group discussions were conducted among purposively-sampled staff, and data analysed using framework approach. Emerging themes were included in subsequent hospital-wide cross-sectional survey. Principal components analysis was performed to derive latent factors applied in multivariable logistic regression analyses.

Results:
Staff acknowledged that HH was a critical component of patient care, but heavy workloads and forgetfulness posed barriers to HH. Many perceived senior colleagues as role models for HH. Staff felt that reminders and nudges from team members, and "HH buddies" could enhance HH compliance. Of 1066 staff, good HH compliance was reported in 40.1% nurses, 31% AHPs, and 22.8% physicians ($P < 0.01$). After adjusting for gender, staff category, professional years, seniority, and history of dermatitis, having positive knowledge, attitudes, and behaviours toward HH (OR 1.44; 95% CI 1.22-1.68; $P < 0.0001$), personal motivators and enablers (OR 1.61; 95% CI 1.39-1.86; $P < 0.0001$) and emotional motivators (OR 1.62; 95% CI 1.40-1.88; $P < 0.0001$) were positively associated with good HH compliance. Perceived barriers to HH (OR 0.83; 95% CI 0.72-0.95; $P = 0.0063$) and need for external reminders (OR 0.76; 95% CI 0.66-0.87; $P < 0.0001$) were negatively associated.

Discussion & Conclusion:
Healthcare staff recognise the importance of HH, but face practical barriers that reduce compliance. Role modelling by senior staff, external reminders, and team members' nudges, could enhance HH compliance and should be actively promoted.

OP-CR-18

Comparing the Epidemiology and Risk Factors for Multidrug Resistant Organisms in Acute Care Hospital and Affiliated Intermediate- and Long-Term Care Facilities

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Background & Hypothesis:
Prevalence of methicillin-resistant *Staphylococcus aureus* (MRSA), vancomycin-resistant *Enterococcus* (VRE), and carbapenem-resistant *Enterobacteriaceae* (CRE) is increasing in acute hospitals. Lesser is known in intermediate- and long-term care facilities (ILTCs). We compared the epidemiology and risk factors for MRSA, VRE, and CRE among patients of an acute hospital and affiliated ILTCs.

Methods:
We conducted a cross-sectional study at Tan Tock Seng Hospital and affiliated ILTCs, 2 June-9 July 2014. MRSA, VRE, and CRE screening was conducted and epidemiologic data obtained. To control for confounding, multivariable logistic regression models were constructed.

Results:
A total of 1700 patients were screened. MRSA prevalence in ICFs (30%) was highest followed by LTCFs (20.4%) and the hospital (11.6%). The hospital had the highest VRE (19.4%) and CRE (2.6%) prevalence. On multivariable analysis, being male (OR 1.69, 95% CI 1.29-2.23), LOS >7 days (OR 2.66, 95% CI 1.74-4.05), being a resident of ICF (OR 3.01, 95% CI 2.16-4.18) or LTCF (OR 1.71, 95% CI 1.19-2.48), and VRE co-colonisation (OR 1.96, 95% CI 1.33-2.91) were positively associated with MRSA colonisation, after adjusting for age and CRE co-colonisation. Age >65 years (OR 1.67, 95% CI 1.18-2.38), LOS >7 days (OR 2.22, 95% CI 1.56-3.17), being an acute hospital inpatient (OR 11.70, 95% CI 7.17-19.09) and MRSA co-colonisation (OR 2.02, 95% CI 1.37-2.99) were associated with VRE colonisation, after adjusting for gender and CRE co-colonisation.

Discussion & Conclusion:
MRSA prevalence in ILTCs was higher than in the acute hospital; the opposite was observed for VRE and CRE. Infection control strategies targeting at-risk patients in acute hospitals and ILTCs should be instituted, to prevent transmission across healthcare settings.

OP-CR-19

Antibiotic Computerised Decision Support System Halves Mortality Risk

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Background & Hypothesis:
Evidence on the clinical benefits of antibiotic computerised decision support systems (CDSS) is limited. We evaluated the effect of an in-house antibiotic CDSS on mortality and the development of *Clostridium difficile* (CDI) and multidrug resistant organism (MDRO) infections

Methods:
We assembled a prospective inpatient cohort, starting from the point of antibiotic prescribing to 30 days posthospital discharge or 180 days postantibiotic prescription. All patients admitted to Tan Tock Seng Hospital, from October 1, 2011 through September 30, 2012 and prescribed piperacillin-tazobactam or a carbapenem for empiric therapy resulting in automatically-triggered launch of CDSS to receive antibiotic recommendations were included. Multivariable multilevel logistic regression models constructed to control for potential confounding.

Results:
One-quarter of 1886 eligible inpatients received CDSS-recommended antibiotics. More patients treated for pneumonia (33.2%) than sepsis (12.1%) and urinary tract infection (7.1%) received CDSS recommendations. Receipt of recommendations seemed to halve the mortality risk of patients (adjusted OR 0.52, 95% CI 0.26-1.07, $P = 0.08$). Patients aged 65 years and below had a greater mortality benefit (OR 0.45, 95% CI 0.20-1.00, $P = 0.05$) than patients aged above 65 (OR 1.28, 95% CI 0.91-1.82, $P = 0.15$). No effect was observed on the incidence of CDI (OR 1.02, 95% CI 0.34-3.01, $P = 0.97$) or MDRO infection (OR 1.06, 95% CI 0.42-2.72, $P = 0.90$).

Discussion & Conclusion:
Receipt of antibiotic CDSS recommendations reduced mortality risk in patients aged 65 years and below, and did not increase the risk in older patients. Physicians should be informed of the benefits to patients to increase their acceptance of CDSS recommendations.

OP-CR-20

What Determines the Patient's Receipt of Antibiotics Recommended by Computerised Decision Support Systems?

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Background & Hypothesis:
Antibiotic computerised decision support systems (CDSS) were developed to guide antibiotic decisions, yet prescriptions of CDSS-recommended antibiotics have remained low. Our study aims to identify patient and physician predictors for patients' receipt of antibiotic recommendations by antibiotic CDSS.

Methods:
We conducted a prospective cohort study in Tan Tock Seng Hospital and included all inpatients prescribed piperacillin-tazobactam or carbapenem for empiric therapy and auto-triggered to receive antibiotic recommendations by the in-house CDSS, 1 October 2011 to 30 September 2012. Clinical data were obtained via electronic linkages of databases. To account for clustering and control for confounding, we used multilevel logistic regression models.

Results:
One-quarter of the 1886 eligible patients received CDSS-recommended antibiotics. Patients who received antibiotic CDSS recommendations were older (mean 74.8 years [SD 14.5] vs 71.8 [15.9]) and had better chronic health status (Charlson's comorbidity index >5 11.5% vs 14.2%) than those who did not. The prescribing physician—but not the attending physician or clinical specialty—accounted for some (13.3%) of the variation. Prior hospitalisation in the preceding 90 days (OR 1.32, 95% CI 1.01-1.71), presumed pneumonia (OR 6.77, 95% CI 3.28-13.99), intensive care unit (ICU) admission (OR 0.38, 95% CI 0.21-0.66), and renal impairment (OR 0.70, 95% CI 0.52-0.93) were factors associated with patients' receipt of CDSS-recommended antibiotics.

Discussion & Conclusion:
Prior hospitalisation and diagnosis of pneumonia positively predicted a patient's receipt of CDSS-recommended antibiotics. ICU admission and renal impairment were negative predictors. Renally-impaired and ICU patients might have more complex clinical conditions that require a physician's assessment in addition to CDSS recommendations.

OP-CR-21

Epidemiology of Vancomycin-Resistant *Enterococcus*: Differences between an Acute Care Hospital and its Affiliated Intermediate- and Long-Term Care Facilities

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Background & Hypothesis:
Vancomycin-resistant *enterococcus* (VRE) infections have increasingly been reported in acute hospitals. However, little is known about the prevalence of VRE in intermediate- and long-term care facilities (ILTCs). We compared the epidemiology of VRE among patients of an acute hospital and affiliated ILTCs, and determined factors associated with VRE colonisation.

Methods:
We conducted a cross-sectional study in Tan Tock Seng Hospital and affiliated ILTCs, 2 June-9 July 2014. Randomly selected patients with >48 hours stay in acute hospital and all patients from ILTCs were included. Rectal swabs or stool samples were collected and cultured for VRE. Epidemiological data were obtained from institutional databases. To control for confounding, multivariable logistic regression models were constructed.

Results:
A total of 1686 patients were screened for VRE. Prevalence was much higher in the acute hospital (20%) than intermediate-care facilities (ICFs) (5.1%) and long-term care facilities (LTCFs) (0.3%) (P <0.0001). Majority of VREs were of vanA genotype (95.4%). VanB genotype was only isolated from inpatients of the acute hospital. On multivariable analysis, age >65 years (OR 1.62, 95% CI 1.14-2.28, P = 0.0067), length of stay (LOS) >7 days (OR 2.40, 95% CI 1.70-3.39, P <0.0001), being an inpatient of the acute hospital (OR 114.33, 95% CI 15.94-820.20, P <0.0001) or an ICF (OR 19.02, 95% CI 2.53-143.16, P = 0.0042) were positively associated with VRE colonisation, after adjusting for gender.

Discussion & Conclusion:
VRE prevalence was much higher in the acute hospital than ILTCs. Inpatients of acute hospitals aged >65 years or had a LOS >7 days should be actively screened for VRE colonisation, to prevent nosocomial transmission.

OP-CR-22

Clinical Audit to Assess the Practice of Glucocorticoid Induced Osteoporosis (GIOP) Prevention in the Department Of Haematology, Tan Tock Seng Hospital

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Background & Hypothesis:
The American College of Rheumatology recommended in 2010 the following: calcium and vitamin D supplement/intake counselling for postmenopausal women or men aged ≥50 years starting glucocorticoid at any dose with an anticipated duration of 3 months or more; fracture risk assessment with FRAX score (which requires femoral neck T score) for patients initiating glucocorticoid; biphosphonate for low fracture risk patients taking prednisolone ≥7.5 mg/day for ≥3 months. High dose prednisolone is used in many haematological conditions. Our audit project aimed to assess the haematologists' compliance to the aforementioned measures.

Methods:
A total of 124 patients aged ≥50 who were prescribed prednisolone for the underlying haematological conditions in year 2012 were included and the following parameters were examined: 1) diagnosis; 2) age; 3) prednisolone ≥7.5 mg/day; 4) duration of prednisolone at any dose ≥3 months; 5) bone mineral density (BMD) measurement; 6) calcium and vitamin D supplement prescription; and 7) biphosphonate prescribed when indicated.

Results:
A total of 83.33% of patients were given calcium and vitamin D supplement when it was indicated; 10.9% of patients had BMD measured for fracture risk assessment; and 8.5% of patients were given biphosphonate when it was indicated.

Discussion & Conclusion:
The compliance of prescribing calcium/vitamin D supplement was satisfactory while the compliance of performing BMD for fracture risk assessment and prescribing bisphosphonate when indicated was poor. We are exploring with haematologists about concerns and applicability of recommendations to various situations in haematological disorders requiring steroids.

OP-CR-23

Symptom Burden and Quality Of Life of Advanced Dementia Patients in a Home Care Setting – A Cross-Sectional Study

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Background & Hypothesis:
Advanced dementia is a life-limiting illness requiring palliative care, most of which is provided in the hospital or nursing home. Evidence regarding symptom burden and perceived quality of life of patients with advanced dementia in a home care setting is lacking. This study aims to investigate symptom burden prevalence in patients with advanced dementia and its relationship with their quality of life indices.

Methods:
This is a prospective, cross-sectional study conducted in a home care setting for advanced dementia (AD) patients. Patients with Functional Assessment Staging of Dementia (FAST) more than 7A, and with a further criteria of 1 of the following: pneumonia in the last 12 months, albumin level less than 35 g/l or a feeding tube were recruited. Pain Assessment in Advanced Dementia (PAINAD) and the Neuropsychiatric Inventory Questionnaire (NPI-Q) measured symptom prevalence and severity while Quality of life in Late Stage Dementia (QUALID) measured patients' quality of life.

Results:
The data for 50 subjects were analysed. Pain was present in 80% of the patients, whilst behavioural issues was present in 72%. The median scores for PAINAD, NPI-Q severity, NPI-Q caregiver distress, and QUALID were 3/10, 2.5/36, 3/60, and 23.5/55 respectively. NPI-Q severity moderately correlated with QUALID (r = 0.30, $P \leq 0.05$).

Discussion & Conclusion:
The preliminary results demonstrate the high prevalence of pain and neuropsychiatric behavioural issues that advanced dementia patients suffer from. Providing home palliative support to AD patients and families may address the high symptom burden and improve their quality of life

OP-CR-24

Flexible Nasoendoscopy Decontamination – A Comparison between Rapicide® and Tristel Wipes, a Prospective Cohort Study

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Background & Hypothesis:
Regular use of nasoendoscopes in otolaryngology departments is well established. Currently, disinfection of nasoendoscopes in our clinic utilises a 3-step process involving Rapicide®, a peracetic acid-based disinfectant. A recent study in the UK validated the efficacy of Tristel wipes, a chlorine dioxide-based disinfectant. Our study aimed to validate the efficacy of Tristel wipes compared to Rapicide®.

Methods:
We recruited 100 volunteers from our clinic who were subjected to flexible nasoendoscopic examination in which 2 separate endoscopes were used. A swab was sent from the tip of each nasoendoscope once the procedure was completed. These swabs were used as the control. The 2 nasoendoscopes were then subjected to a similar 3-step decontamination process. Firstly, the scopes were cleansed with multizyme solution. Following which, one scope was placed in Rapicide® for 20 minutes and the other was disinfected with the Tristel wipes according to the manufacturer's guidance. Both were then cleansed with distilled water. Subsequently, a second swab was taken from the tip of each nasoendoscope and sent for cultures.

Results:
We grew 82 and 76 positive cultures prior to disinfection with Rapicide® solution and Tristel wipes, respectively. With regard to post decontamination results, there was 1 positive culture swab for the Rapicide® cohort compared with 4 for the Tristel wipes cohort. In terms of efficacy, Rapicide® had 98.8% compared to Tristel wipes 97.4% with no significant difference ($P = 0.517$).

Discussion & Conclusion:
We present the first prospective cohort study which suggest similar efficacy of both the Tristel wipes and Rapicide® solution.

OP-CR-25

Analysis of Outcome of 9 Patients with Intraocular Lymphoma from a Tertiary Referral Eye Care Centre in Singapore

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Background & Hypothesis:
Intraocular lymphoma is a rare form of intraocular malignancy accounting for about 0.01% of ophthalmic diseases. We aim to report clinical profile and outcome of 9 patients with intraocular lymphoma from a tertiary referral eye care centre in Singapore.

Methods:
Patients with intraocular lymphoma diagnosed and treated at a tertiary referral eye care centre in Singapore between January 2005 and December 2014 were identified from the uveitis database retrospectively. Demographic characteristics, clinical presentation, investigations performed and their outcome were recorded.

Results:
Nine (0.004%) patients out of 2015 patients from the uveitis database were found to have diagnosis of intraocular lymphoma. There were equal distribution between males and females with median age of presentation as 60.3 years. A majority of these patients (55%) presented with bilateral involvement with vitreo-retina being the most common site of infiltration (78%). Top presenting complaints were blurring of vision (67%) and floaters (56%). Vitritis was noted in 5 patients (56%) and 1 patient (11%) presented with optic nerve infiltration. The duration from ocular presentation to lymphoma diagnosis ranged from 1 day to 18 months. Five patients (56%) had primary intraocular lymphoma; of which 4 of them (80%) subsequently progressed to have systemic involvement. Anterior chamber fluid for cytology was most useful in our centre in detecting intraocular lymphoma (44%) but 3 patients (33%) required diagnostic vitrectomy for confirmatory diagnosis.

Discussion & Conclusion:
The diagnosis of intraocular lymphoma remains to be challenging. A higher index of suspicion is required for timely diagnosis and management of ocular and extra-ocular lymphoma.

OP-CR-26

The Effect of Osteoporosis on Collapse of the Dynamic Hip Screw in Elderly Patients with Intertrochanteric Fractures

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Background & Hypothesis:
Intertrochanteric hip fractures occur commonly in the elderly population and are frequently associated with osteoporosis. In this study, we aim to evaluate the effect of osteoporosis on the collapse of the dynamic hip screw (DHS) used to treat these fractures.

Methods:
Preoperative radiographs were examined and the fractures were classified according to Evans' classification. T-scores from perioperative bone mineral density scans were used as a measurement of osteoporosis. Postoperative follow-up radiographs at 6 weeks, 3 months, 6 months and 1 year were reviewed to determine any interval shortening or collapse of the dynamic hip screw within the side plate barrel.

Results:
The average age of the patients was 78 years. There were 87 female and 34 male patients; 67 patients had Evans' Type 1 and 2 fractures, while 54 patients had Types 3 to 5 fractures. In patients with T scores $\leq$-2.5, the mean femoral neck shortening at 6 months and 1 year post surgery was 8.8 mm and 9 mm respectively, significantly higher than patients with T scores >2.5 ($P = 0.02$, $P = 0.03$). Patients with Evans' Type 1 and 2 fractures had significantly less femoral neck shortening at all study intervals, when compared to patients with Type 3 to 5 fractures. Seven out of 8 patients with fixation failure in the form of screw cutout at 1 year postsurgery had osteoporosis.

Discussion & Conclusion:
Osteoporosis is a significant predictor of femoral neck shortening and fixation failure in elderly patients with intertrochanteric fractures treated with DHS.

OP-CR-27

Outbreak of New Delhi Metallo-Beta-Lactamase-1-Producing *Enterobacter Cloacae* in an Acute Care Hospital General Ward in Singapore

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Background & Hypothesis:
Autochthonous infections with New Delhi metallo-β-lactamase-1 (NDM-1) producing *Enterobacteriaceae* have been reported in Singapore since 2011, but nosocomial transmissions have yet to be reported. We report an outbreak of NDM-1-producing *Enterobacter cloacae* among adults admitted to an acute hospital's general ward.

Methods:
Upon detecting the index case with a culture specimen positive for NDM-1-producing *E. cloacae*, active case finding was conducted by screening all possible patient contacts. On-site ward assessment was performed, and electronic patient medical records were reviewed to conduct a case-control study to identify factors associated with colonisation.

Results:
Of 55 screened patient contacts, 3 further cases were detected, having isolates genetically related to the index case. None of these 4 cases was housed within the same cubicle. However, 3 were managed by the same medical team. Being managed by this team was positively associated with being a case (adjusted odds ratio (AOR) = 15.64, 95% confidence interval 0.91-270.27; P = 0.059), after adjusting for age, gender, Charlson's comorbidity index score, and recent antibiotic use.

Discussion & Conclusion:
Our report suggests nosocomial transmission of NDM-1-producing *E. cloacae* via healthcare staff. Holistic measures to address gaps in infection control are needed to reduce the spread of highly resistant pathogens such as NDM-1-producing *Enterobacteriaceae*.

OP-CR-28

Role of Anthropometric Data in the Prediction of 4-Stranded Hamstring Graft Size in Anterior Cruciate Ligament Reconstruction

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Background & Hypothesis:
We aimed to evaluate whether preoperative anthropometric data can predict the optimal diameter and length of hamstring tendon autograft for anterior cruciate ligament (ACL) reconstruction.

Methods:
This was a cohort study involving 169 patients who underwent single-bundle ACL reconstruction (single surgeon) with 4-stranded gracilis and semi-tendinosus autografts. Height, weight, body mass index (BMI), gender, race, age and smoking status were recorded preoperatively. Intraoperatively, the diameter and length of the 4-stranded autograft was recorded. Multiple regression analysis was used to determine the relationship between the anthropometric measurements and the length and diameter of the implanted autografts.

Results:
The strongest correlation between 4-stranded hamstring autograft diameter was height and weight. This correlation was stronger in females than males. BMI had a moderate correlation with the diameter of the graft in females. Females had a significantly smaller graft both in diameter and length when compared with males. Linear regression models did not show significant correlation between hamstring autograft length with height and weight (P >0.05). Simple regression analysis demonstrated that height and weight can be used to predict hamstring graft diameter. The following regression equation was obtained for females: Graft diameter = 0.012 + 0.034 *Height + 0.026 *Weight (R2 = 0.358, P = 0.004). The following regression equation was obtained for males: Graft diameter = 5.130 + 0.012 *Height + 0.007 *Weight (R2 = 0.086, P = 0.002).

Discussion & Conclusion:
Preoperative anthropometric data has a positive correlation with the diameter of 4-stranded hamstring autografts but no significant correlation with the length. This data can be utilised to predict the autograft diameter and may be useful for preoperative planning and patient counselling for graft selection.

OP-CR-29

Findings of the Middle East Respiratory Syndrome Coronavirus (MERS-CoV) Surveillance Programme from the Communicable Disease Centre, Tan Tock Seng Hospital, Singapore

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Background & Hypothesis:
Singapore has set up a surveillance system to monitor the entry of suspected MERS-CoV patients since September 2012, following reports of this emerging infectious disease in the Middle East. This study reports the surveillance findings of the Communicable Disease Centre, Tan Tock Seng Hospital, the national referral centre for outbreaks of emerging infectious diseases in Singapore.

Methods:
We conducted a retrospective review of all cases screened at the hospital's Emergency Department from September 2012 to February 2015.

Results:
A total of 443 cases were screened during the 30-month study period. The median age was 48 years (range 1-88 years) and half were male; 162 (37%) patients were admitted, with 39% of these fulfilling the Ministry of Health definition of a suspected case. Among admitted patients, 155 (96%) had combined nasal and throat samples tested for MERS-CoV by RT-PCR; the remaining 7 had MERS-CoV infection excluded based on clinical grounds. Test results were all negative. A total of 141 (87%) also underwent influenza virus testing by RT-PCR, with 39 (28%) testing positive; 51 patients (31%) had clinical and/or radiological evidence of pneumonia, of whom 11 tested positive for influenza and 6 for pneumococcal disease. Two patients required ICU care and both were positive for influenza (1 A/H3 and 1 A/H1N1). Both cases subsequently recovered.

Discussion & Conclusion:
This study highlights a high proportion of vaccine-preventable infections among travellers to the Middle East with respiratory symptoms. Pretrip vaccinations against influenza, as well as pneumococcal disease for high-risk individuals, are recommended in addition to existing mandatory vaccinations.

OP-CR-30

Increases in Infection- and Cancer-Related Mortality in an Adult Tertiary Care Public Hospital in Singapore: An 8-Year Observational Study

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Background & Hypothesis:
This study aims to describe mortality trends and assess changes in the causes of death in an adult tertiary care hospital in Singapore.

Methods:
We conducted a cross-sectional study involving a retrospective medical record review for all in-house deaths in Tan Tock Seng Hospital from January 2007 to December 2014.

Results:
A total of 22,857 deaths were observed, with annual deaths ranging from 2618 to 3069 cases; 71% were aged >65 years and the male-to-female ratio was 1.3:1; 71% were classified as non-coroner's cases. The median age among the non-coroner's cases significantly increased from 76 (IQR 64-84) years in 2007 to 78 (IQR 67-86) years in 2014 (P <0.0001). Overall, the proportion of infectious disease-related deaths increased by 7% (95% CI 3.9-10%), from 44.2% to 51.2% during the 8-year period. Cancer-related deaths increased by 4.4% (95% CI 2.1-6.7%) from 14.9% in 2007 to 19.3% in 2014. In contrast, the proportion of cardiovascular-related deaths declined by 8.4% (95% CI 5.8-10.9%) from 26.3% in 2007 to 17.9% in 2014. This trend was observed both in elderly patients above 65 years, as well as in younger patients.

Discussion & Conclusion:
Over the 8-year period, the proportion of infection- and cancer-related deaths increased, while that for cardiovascular disease deaths declined. National efforts to reduce cancer-related mortality should be stepped up, both through primary prevention (by reducing lifestyle risk factors) and secondary prevention measures (by increasing uptake for the national screening programmes).

OP-CR-31

Combining Machine Learning and Neuroimaging: A Personalised, Data-Driven Classification Tool for Schizophrenia and Bipolar Disorder

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Background & Hypothesis:
Many magnetic resonance imaging (MRI) studies have shown group differences in multiple brain structures of patients with schizophrenia and bipolar disorder, as compared to healthy subjects. However, the MRI measures which lie on a continuum across subjects do not discriminate between patients and controls on an individual subject level. Machine learning methods have lately emerged as powerful tools for classification of high-dimensional data. Here we aimed to devise a MRI-based machine learning algorithm that allows accurate individual diagnosis of schizophrenia and bipolar disorder.

Methods:
High-resolution structural T1-weighted MRI scans were obtained from 165 subjects with schizophrenia, 37 subjects with bipolar disorder and 78 healthy subjects from 2006 to 2013. Multiple MRI measures (subcortical volumes and cortical thickness) were derived from each subject after specialised image processing. Random Forest prediction models were trained using the multivariate MRI measures to discriminate between schizophrenia patients, bipolar patients and healthy subjects.

Results:
Ten-fold cross-validation of the algorithm showed that schizophrenia patients can be discriminated from healthy controls, with 81.6% accuracy. The algorithm also discriminated between schizophrenia and bipolar disorder with 70.1% accuracy. Key MRI brain measures in the frontal, temporal and cingulate regions with strong discriminative power for differential disease diagnosis were identified.

Discussion & Conclusion:
Our algorithm can objectively and reliably classify clinically overlapping disorders that are sometimes not clear cut (schizophrenia and bipolar) based on complex individual neuroanatomy, suggesting a potential combinatorial role of machine learning and neuroimaging in aiding clinical management including clarification of diagnosis.

OP-CR-32

Evaluation of the Staff Medical Certificate Surveillance System in Tan Tock Seng Hospital, 2010-2014

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Background & Hypothesis:
Tan Tock Seng Hospital (TTSH) has a web-based staff medical certificate (MC) surveillance system used to detect staff clusters of acute gastroenteritis, conjunctivitis and acute respiratory infections (ARIs) in the wards, which warrant rapid response to reduce risk of transmission to patients and other healthcare workers. We undertook a study to assess the completeness of submitted data and to identify factors associated with MCs due to ARI among staff.

Methods:
We conducted a cross-sectional study for a 5-year period, from January 2010 to December 2014, comparing MC surveillance data with sick leave records submitted to the hospital human resource department. We also assessed for the degree of correlation of our data with national polyclinic attendances for ARI, TTSH's emergency department (ED) attendances for pneumonia, and influenza activity among TTSH patients.

Results:
Overall compliance to staff MC data submission was high (81.5%). Staff absenteeism for ARIs was moderately correlated with polyclinic attendances (strongest correlation with polyclinic attendances 1 week earlier–Pearson correlation coefficient r = 0.49, *P* <0.001); weakly correlated with ED admissions for pneumonia in patients under 65 (strongest correlation with ED admissions 1 week earlier – Pearson correlation coefficient r = 0.17, *P* = 0.006); and weakly correlated with Influenza A/H1N1 activity (strongest correlation with A/H1N1 activity 1 week earlier – Spearman correlation efficient r = 0.29, *P* <0.001).

Discussion & Conclusion:
National polyclinic attendances for ARI, ED admissions for pneumonia, and influenza activity may be useful covariates to predict staff absenteeism for ARI, and should be considered when developing a forecasting model for this purpose.

OP-CR-33

Progressive Volume Change in the CA1 Subfield of the Hippocampus in Subjects at Ultra-High Risk for Psychosis: A Prospective Study

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Background & Hypothesis:
Volume deficits of the hippocampus are a robust finding in schizophrenia. We recently reported a volume deficit in the CA1 subfield of the hippocampus in patients with first-episode schizophrenia. In this prospective 2-year study, we sought to determine whether CA1-specific volume deficit precedes or manifests during the onset of clinical psychosis in subjects at ultra-high risk (UHR) for psychosis.

Methods:
UHR subjects and healthy controls (HC) were recruited from the community from 2009 to 2015. By the end of 24 months, high-resolution MRI data of 2-3 time points (12 months interval) were obtained from 41 UHR subjects who did not remit (UHR-NR), 41 UHR subjects who remitted (UHR-R), 10 UHR subjects who developed clinical psychosis (UHR-psychotic), and 54 HC (all demographically-matched). Hippocampal subfields were labelled based on a probabilistic atlas constructed from ultra-high resolution postmortem hippocampal tissue. Linear mixed-effects modeling was applied to determine group differences in the volume trajectories.

Results:
No baseline differences in volumes were found among the groups. Progressive atrophy (significant group X time interaction effect) in the right hippocampus in UHR-NR ($P = 0.001$) and UHR-psychotic subjects ($P = 0.01$) were observed, compared to HC. Critically, CA1 atrophy was found in UHR-NR (right: $P = 0.04$; left: $P = 0.04$) and UHR-psychotic subjects (right: $P = 0.006$), compared to HC. The CA1 atrophy of UHR-R was not different compared to HC, but differed compared to UHR-NR ($P < 0.001$) and UHR-psychotic ($P < 0.001$).

Discussion & Conclusion:
The gradual atrophy of CA1, which was not present in the remitted ultra-high risk subjects, marked the persistent risk for psychosis, as well as psychosis onset.

OP-CR-34

Should All Elderly with Malnutrition be Screened for Underlying Cognitive Impairment and Functional Impairment?

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Background & Hypothesis:
Malnutrition in the elderly is multifactorial and associated with poor clinical outcomes. Often, only dietary recommendations are given. The aim of this study was to determine the prevalence of cognitive impairment, functional impairment and malnutrition in elderly admitted to acute medical wards in a tertiary hospital.

Methods:
The 3-Minute Nutrition Screening (3MinNS) and the Abbreviated Mental Test (AMT) was performed on 224 elderly above 65 years old, admitted to the general medicine wards over a 4-week period. Functional status was obtained from case notes and electronic medical records. The cutoff 3MinNS score used to identify malnourished patients was 3. The cutoff AMT score used to identify patients with cognitive impairment was 7 regardless of educational background. Patients were classified into independent or assisted if they needed assistance in 2 or more activities of daily living.

Results:
The mean age was 80 years, minimum 65 years and maximum 104 years old; 85 (37.9%) were males and 139 (62.1%) were females; 67 (29.9%) were malnourished on admission; 19 (28.3%) malnourished patients had severe malnutrition, with a 3MinNS score of 5 or more. Out of the 67 malnourished patients, 59 (88.1%) had impaired cognition and 65 (97.0%) required functional assistance.

Discussion & Conclusion:
A total of 88.1% of malnourished patients had cognitive impairment and 97% required functional assistance. Providing nutrition advice alone may not be sufficient if patients are unable to comprehend and retain the information provided, or are unable to prepare their own meals. Comprehensive geriatric assessment and caregiver involvement is crucial in malnutrition assessment and management of elderly patients.

OP-CR-35

Risk of Stroke and Intracranial Haemorrhage in a Chinese Population with Atrial Fibrillation in Tan Tock Seng Hospital

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Background & Hypothesis:
Current risk schemes to predict as well as treatment of ischaemic stroke and intracranial haemorrhage (ICH) in atrial fibrillation (AF) are derived primarily using a Caucasian population. The purpose of this study was to describe the risk of ischaemic stroke and ICH in a cohort of Chinese AF patients in Singapore with long-term follow-up.

Methods:
This observational study used a hospital-based cohort of Chinese patients with non-valvular AF.

Results:
Among 1109 patients with non-valvular AF (age 67 ± 14 years, 56% females), 260 patients (23%) did not receive antithrombotic therapy, 719 patients (64.8%) were taking aspirin, and 130 (12%) were taking warfarin. After mean follow-up of 7.23 years, 128 patients (34%) without antithrombotic therapy developed ischaemic strokes. Use of aspirin and warfarin were associated with reduced annual risk of ischaemic stroke by 29% and 47%, respectively ($P < 0.5$). The annual incidence of ICH in patients taking aspirin and warfarin was 0.29% per year and 0.25% per year, respectively.

Discussion & Conclusion:
Chinese AF patients are at high-risk for ischaemic stroke. The study showed clinical benefit favours the use of warfarin over aspirin or no therapy for stroke prevention in Chinese AF patients.

OP-CR-36

Potential Harm of Prophylactic Platelet Transfusion in Adult Dengue

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Background & Hypothesis:
Transient thrombocytopenia is common in dengue. Concern of bleeding risk from severe thrombocytopenia may lead to preventive platelet transfusion. Data from small series in neonatal dengue shock syndrome and adult dengue fever did not show benefit.

Methods:
We studied all hospitalised adult dengue patients at Communicable Disease Centre, Singapore from 2005 to 2008 with a positive dengue polymerase chain reaction or serology (fulfilled World Health Organization 1997/2009 probable dengue criteria) whose platelet was lower than 20 x 10^9/L without bleeding. We aimed to study potential benefits and harms of preventive platelet transfusion.

Results:
Of 7500 patients who developed platelet count $\leq$20 x 10^9/L without bleeding, and 788 were transfused platelet. At baseline, transfused patients had more leukopenia (3.3 vs 3.8, x 10^9/L), thrombocytopenia (14 vs 16, x 10^9/L), and neutrophilia (50% vs 45.2%), and higher AST (207 vs 153, U/L) and ALT (117 vs 84, U/L) levels (P <0.05). The 2 groups were similar in age, fever duration, systolic blood pressure and hematocrit. While transfused patients had higher platelet increment the next day (8 vs 5, x 10^9/L), they had more mucosal bleeding (18% vs 9%), longer time to platelet $\geq$50 x 10^9/L (3 vs 2 days) and hospital stay (6 vs 5 days). There was no difference in all clinical (23% vs 18%) and severe bleeding (3.4% vs 1.3%), intensive care admission (3.4% vs 1.3%) or death (0.2% vs 0%).

Discussion & Conclusion:
Preventive platelet transfusion was associated with higher platelet increment but appeared to cause potential harm in prolonging platelet recovery and hospital stay without reducing all clinical or severe bleeding.

OP-CR-37

Non-Simultaneous Bilateral Fragility Hip Fractures in an Elderly Singapore Population

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Background & Hypothesis:
With a rapidly ageing population, fragility hip fractures are a growing public health concern due to their increasing incidence and functional repercussions. This study describes the patient and treatment characteristics of non-simultaneous bilateral hip fractures in a tertiary orthogeriatric hip fracture centre.

Methods:
This was a single centre retrospective study of 538 patients admitted for a fragility hip fracture occurring between 1 October 2011 to 30 September 2012. Patients with a previous contralateral fragility hip fracture were identified and their epidemiology studied.

Results:
Out of 538 patients, 39 (7.25%) had sustained a previous contralateral hip fracture; 7 were male (17.9%) and 32 were female (82.1%). Mean age of occurrence of first fracture was 77.5 years (range: 60-96) and 82.8 years (range: 65-98) for the second fracture. Mean time between the 2 fractures was 71.3 months (range: 1-357). The first and second fractures were of the same morphology in 28 cases (71.8%) [15 intertrochanteric, 13 femoral neck]. Of these 28 patients, 15 (53.8%) [7 intertrochanteric, 8 femoral neck] were treated similarly for both fractures. Prior to the occurrence of the second fracture, only 13 patients (33.3%) were on osteoporosis treatment. At 2.5 years follow-up, 12 patients were deceased (30.77%), mean age of 85.25 years (range: 72-96). Average time between second fracture and death was 22.3 months (range 0-38).

Discussion & Conclusion:
Bilateral non-simultaneous hip fractures in the elderly local population have a relatively high incidence (7.25%) and mortality rate (30.77%). This highlights the need for active prevention and treatment of osteoporosis and secondary hip fractures.

OP-CR-38

Routine Staging CT Thorax in Treatment-Naive Hepatocellular Carcinoma Prior to Loco-Regional Therapy, is There a Need?

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Background & Hypothesis:
Pulmonary metastases (PM), while being the commonest site of distant metastasis in hepatocellular carcinoma (HCC), remains a rare occurrence. Their presence, nevertheless, contraindicates curative loco-regional therapies. The role of staging CT thorax before loco-regional treatment is currently not well defined. This study aims to assess the utility of pretreatment CT thorax and predictive value of imaging features of HCC for PM.

Methods:
Retrospective review of continuous cases of treatment-naive HCC referred for loco-regional therapy from 2004 to 2013 was performed. Patients with pretreatment CT thorax were evaluated by 2 radiologists for presence of PM. HCC features (size, numbers, vascular invasion, nodal status, bone metastases) were recorded. Univarate analysis (Chi square/Fisher's exact test) and multivariate logistic regression were performed for significant association.

Results:
A total of 780 patients were reviewed, of which 135 had staging CT thorax. PM (n = 17, 12.6%), benign lesions (n = 41, 30.4%) and indeterminate lesions (n = 6, 4.4%) were detected. Among the indeterminate lesions, there were loss to follow-up (n = 2), deaths within the study period (n = 2) and continued surveillance (n = 2). All patients with PM were declined loco-regional therapy. Univariate analysis showed statistical significant association between PM with number of intra-hepatic lesions (P <0.01), primary tumour size (P = 0.018) and presence of vascular invasion (P <0.01). On multivariate analysis, the number of intra-hepatic lesions (OR: 9.7; 95% CI: 1.6-57.2, P = 0.012) and presence of both hepatic and portal venous invasion (OR: 11.8; 95% CI: 1.1-128.8, P = 0.043) are the 2 independent positive predictors of PM.

Discussion & Conclusion:
The prevalence of pulmonary metastasis is low in HCC and our study does not support the routine use of staging CT thorax in treatment-naïve patients. It can however be considered in selected cases with multiple lesions or vascular invasion.

OP-CR-39

Treatment of Primary Palmar Hyperhidrosis Using Glycopyrrolate Iontophoresis: Intensity of Electrical Current Used, Efficacy and Side Effects

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Background & Hypothesis:
Hyperhidrosis is caused by a dysfunction in sweat regulation by the sympathetic nervous system, resulting in higher production of sweat. Iontophoresis with glycopyrronium bromide solution has been used for the treatment of primary localised hyperhidrosis. The impact of intensity of electrical current on efficacy and side effects are not known.

Methods:
In this retrospective cohort study, patients with primary palmar hyperhidrosis who received iontophoresis treatment between July and October 2014 were included. Data collected included the intensity of electrical current used, efficacy, and side effects.

Results:
A total of 604 sessions were performed in 114 patients. The mean number of palmar dry days was 7.3 ± 4.7 (range 0-28). The mean current used was 6.7 ± 2.4mA (range 1.5-10.0). Mild systemic side effects were reported in at least 1 treatment in 107 (93.9%) patients. The side effects were present in 488 (80.8%) treatments, and lasted 0.9 ± 0.6 (range 0-3) days. Analysis using the generalised estimating equation revealed that the intensity of electrical current used correlated positively with the duration of palmar dryness ($z = 10.92$, $P < 0.001$) and incidence of side effects ($z = 4.86$, $P < 0.001$), but not the duration ($z = -0.57$, $P = 0.57$) of side effects.

Discussion & Conclusion:
In our patients receiving glycopyrronium bromide iontophoretic treatment for primary palmar hyperhidrosis, use of increasing tolerable intensities of electric current correlated with increasing duration of palmar dryness. Side effects, which were generally mild, occurred in the vast majority of the patients and correlated with increasing intensities of current used. Increasing intensity, however, demonstrated a maximal effect both in providing efficacy and inducing side effects, which was 7.5-8.0mA in this study.

OP-CR-40

Serum Predictors for Outcome of Hospitalisation during Exacerbation of Bronchiectasis in Adults

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Background & Hypothesis:
Bronchiectasis exacerbation involves an active local and systemic inflammatory response. Serum inflammatory markers may be used as indirect markers for disease activity and severity of an exacerbation. The role of C-reactive protein (CRP) in chronic obstructive pulmonary disease exacerbation and cardiovascular disease has been well documented. However, its role on predicting outcomes such as length of hospital stay (LOS) and mortality during bronchiectasis exacerbation is unclear.

Methods:
A total of 318 patients admitted with acute exacerbation of bronchiectasis were evaluated retrospectively. Patients' demography, smoking status, comorbidities, spirometry, body mass index, investigations [CRP, neutrophil, platelet, haemoglobin (Hb), procalcitonin, mean platelet volume (MPV) and albumin, presence of infiltrates/consolidations on chest radiograph (CXR)] and outcomes were analysed.

Results:
We studied 257 patients with high-sensitivity CRP levels measured during the first 48 hours of hospital admission. Males was 98 (38%). Median (interquartile range) age and FEV1% predicted was 72 (62-80) years and 47 (37-54) percent. Median (IQR) LOS was 5 (4-8) days. LOS was significantly correlated with high-sensitivity CRP ($R2 = 0.141$, *P* = 0.024), Hb ($R2 = 0.158$, *P* = 0.011), neutrophil ($R2 = 0.179$, *P* = 0.004) and albumin ($R2 = 0.316$, *P* <0.0001). No correlation noted between LOS, age, platelet, procalcitonin, MPV, BMI and FEV1% predicted. In multivariate analysis, serum albumin less than 32 g/L and presence of infiltrates/consolidations on CXR were independent predictors of LOS of more than 5 days. High-sensitivity CRP, neutrophil, male, elderly and Hb were not predictors of longer LOS. There were 9 deaths with no obvious predictors.

Discussion & Conclusion:
This study showed that there was correlation between LOS, high-sensitivity CRP, Hb, neutrophil and albumin during bronchiectasis exacerbation. Low serum albumin (<32 g/L) and abnormal CXR were independent predictors of longer LOS.

OP-CR-41

Psychosocial Determinants of Consistent Influenza Vaccination Uptake by Nurses

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Background & Hypothesis:
Influenza causes significant morbidity annually. Vaccination of healthcare staff substantially reduces nosocomial influenza. However, staff's vaccination uptake is low. Our study aimed to examine nurses' perceptions and attitudes towards influenza vaccination, and determine psychosocial factors associated with consistent annual vaccination uptake.

Methods:
We conducted a cross-sectional study on nurses who have worked at least 2 years at Tan Tock Seng Hospital in May 2012. A 43-item self-administered questionnaire was used to evaluate perceptions and attitudes towards influenza vaccination. Principal component analysis was used to derive the latent factor structure that was later applied in the multivariable analysis.

Results:
A total of 650 nurses completed the survey; 58% nurses perceived influenza vaccination to be beneficial. On univariate analysis, age (OR 1.040, 95% CI 1.019-1.061), years of working in current hospital (OR 1.038, 95% CI 1.011-1.062), perceived vaccination benefits (OR 1.156, 95% CI 0.988-1.353) and vaccination accessibility (OR 1.193, 95% CI 1.017-1.402) were associated with consistent vaccination (vaccination for 2 consecutive years). Nurses who perceived influenza vaccination as being beneficial were 1.5 times more likely to be consistently vaccinated (OR 1.525, 95% CI 1.113-2.090). Among nurses aged ≤29 years, hospital's promotional efforts were negatively associated with consistent vaccination uptake (OR 0.836, 95% CI 0.676-1.033). In contrast, promotional efforts were positively associated with vaccination compliance in nurses aged >29 years (OR 1.357, 95% CI 1.053-1.749)

Discussion & Conclusion:
Perceived benefits of vaccination and hospital's promotional efforts were determinants of consistent influenza vaccination uptake. Education on vaccination benefits and promotional efforts targeting older nurses can enhance uptake.

OP-CR-42

Outcomes of an Accelerated Conservative Management Protocol for Hip Fractures in the Elderly

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Background & Hypothesis:
The majority of hip fractures in elderly patients are managed surgically while traction remains the mainstay of conservative treatment. This study aims to evaluate the outcomes of early wheelchair mobilisation as an alternative treatment option.

Methods:
This is a retrospective study of 87 elderly patients who elected for conservative management of their hip fractures over a 1-year period. Patients are mobilised with assistance as soon as possible after. Variables collected include patient demographics, fracture characteristics, inpatient mobilisation milestones, MFAC (Modified Functional Ambulation Classification) and MBI (Modified Barthel Index) scores and radiological findings.

Results:
Patients who were younger, could sit up earlier, and had a shorter length of stay, were able to ambulate better at 6 months. Patients with femoral neck fractures and shorter length of stay had better MFAC scores. At 12 months, 48% of previous walkers were able to walk; 58% of patients with radiological follow-up had worsening of their fractures with age, type of fracture and length of stay as predictors. Only 24% of fractures eventually healed. The grade of fracture, Charlson's score, day to sitting up and day to transfer affect fracture healing. The mean length of stay is 17.42 days and the 1-year mortality is 18%.

Discussion & Conclusion:
Early wheelchair mobilisation for conservatively treated hip fractures in the elderly is safe with low morbidity and mortality as a result of shorter length of stay. However, only 48% of patients were able to achieve ambulation by 1 year, and only 24% of fractures healed.

OP-CR-43

Test-Retest Reliability of Social Cognitive Measures in Schizophrenia in Singapore

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Background & Hypothesis:
Social cognition has become a high priority in schizophrenia research. Impaired social cognition in schizophrenia may be a primary mechanism to explain poor functioning in social competence, quality of life and community functioning in patients. However, the absence of standardised measures with established reliability remains a prominent challenge towards treatment development. A widely applicable and standardised battery could advance our understanding of social cognitive impairments in schizophrenia. Additionally, the importance of cultural factors should not be neglected. This study examines this in an Asian setting.

Methods:
Five social cognitive tests across 3 domains (The Bell Lysaker Emotion Recognition Task (BLERT), the Profile of Nonverbal Sensitivity (Mini-PONS) and Relationship Across Domains (RAD), the Awareness of Social Inference Task-Revised (TASIT-R) and The Hinting Task) had been selected and administered to 22 participants with schizophrenia from the Institute of Mental Health, Singapore. These tests and domains were selected based on an expert RAND panel held as part of the SCOPE study in the US. Pearson correlations were calculated to evaluate test-retest reliabilities as tests were administered twice within a 4-week interval.

Results:
Correlations ranged between 0.446 to 0.860, with RAD and TASIT-R Branch 3 having the highest test-retest reliabilities.

Discussion & Conclusion:
These results indicate that these tests might prove to be useful in measuring social cognitive abilities and would require additional work to determine if these results would hold given a larger population. This study will pilot the evaluation of the use of these social cognitive measures in Singapore and serve as a reference for future studies.

OP-CR-44

Anterior Accessory Saphenous Vein – To Treat or Not To Treat?

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Background & Hypothesis:
The indications to treat the anterior accessory saphenous vein (AASV) during endothermal ablation of great saphenous vien (GSV) are as yet unclear. We analysed the role of AASV reflux in recurrence after endovenous laser therapy (EVLT) of the GSV in a historical cohort of patients.

Methods:
A retrospective analysis of consecutive EVLT (Dornier 940nm Laser) procedures performed at a single centre between 2006 and 2011 for GSV reflux was done. All cases are traced for recurrence using the national electronic health record and paired duplex scans from the time of the operation and at recurrence were compared.

Results:
Of the 326 EVLT procedures performed, duplex data on 307 patients were traced for analysis; 206 of these had isolated GSV reflux with no AASV seen on duplex; 101 patients (33%) had an AASV on the original duplex of which 56 (55%) were incompetent; 32 patients (10.3%) had a recurrence with a median time to recurrence of 11.3 months. However, the recurrence rate for original GSV reflux only patients was 3% (6/206), GSV reflux but competent AASV was 9% (4/45) and for those with AASV reflux was 39% (22/56). The median time to recurrence was 13.6 months for GSV reflux only, 9.3 months for those with competent AASV and 6.2 months if AASV was incompetent.

Discussion & Conclusion:
AASV reflux, when untreated, leads to an over ten-fold increase in recurrence rate after GSV ablation. The time to recurrence is also shorter. Patients with AASV reflux should be treated together with GSV reflux.

OP-CR-45

Onset and Progression of Kidney Disease in Patients with Type 2 Diabetes – Lessons Learnt from Diabetic Nephropathy Cohort Study

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Background & Hypothesis:
We aim to understand the factors associated with onset and progression of nephropathy (DN) in type 2 diabetes mellitus (T2DM).

Methods:
The DN cohort (n = 2962) involved patients with T2DM attending a DM centre from 2002 to 2014. Blood and urine samples were collected at baseline and through follow-up. We identified 533 patients for new onset DN and 967 patients for renal progression nested within the cohort. New onset DN was defined as first occurrence of estimated glomerular filtration rate (eGFR) to <60 ml/min/1.73 m^2 and/or increase of urine albumin-to-creatinine ratio (uACR) to $\geq$30 mg/g. Progression was defined as annual rate of eGFR decline $\geq$ median cohort value (-1.82 ml/min/1.73 m^2/year) and/or increase of uACR to $\geq$30 mg/g or $\geq$300 mg/g in patients with pre-existing chronic kidney disease.

Results:
The median follow-up period was 5.8 years (4.5-7.1) and 5.3 years (3.9-6.9) for onset and progression, respectively. The proportions of patients with onset and progression were 45.4% and 61%, respectively. Higher baseline uACR and greater HbA1c variability were independently associated with onset and progression in multivariable logistic regression. Male and older age group were associated with onset whereas higher HbA1c, decreasing eGFR, higher systolic blood pressure and higher LDL-cholesterol were associated with progression.

Discussion & Conclusion:
Onset of DN and its progression have shared (uACR & HbA1c) and unshared (gender, age and cardiometabolic burden) risk factors, some of which are modifiable and may inform treatment strategies.

OP-CR-46

Halting NDM-Producing Enterobacteriaceae Spread with the Reactive Infection Control Strategy: A Real World Experience Analysed Using Epi-Score and Whole-Genome Sequencing

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Background & Hypothesis:
Guidelines recommend screening of epidemiologically linked patients to contain the spread of carbapenem-resistant Enterobacteriaceae (EB). We assessed the effectiveness reactive infection control strategy in controlling the spread of NDM-1-(EB) using 2 measures:1) Epi-score, a novel spatiotemporal epidemiologic risk measure, and 2) whole-genome sequencing.

Methods:
Between September 2010 and December 2011, TTSH implemented pre-emptive cohorting and rectal surveillance for NDM-1 of patients with epidemiological linkage (contacts) to patients with NDM-1-EB isolated from clinical cultures (index). A clinical transmission model was produced based on epidemiological relatedness. The Epi-score graded epidemiologic-relatedness from 0 (unrelated) to 4 (very related), based on spatiotemporal ward overlap (2 points), shared medical teams (1 point), and shared medical department (1 point). This was compared with a molecular transmission model, which was produced using whole-genome sequences (WGS) of all NDM-1-EB isolates with core-genome single-nucleotide polymorphism analysis.

Results:
A total of 6 index clinical NDM-1-EB were detected (patients 1-3, 5, 7-8) (5 urine and 1 bile). Contact screening of 436 patients detected 2 (0.5%) (patients 4, 6) newly detected NDM-1-EB carriers. Epi-score distributions: 3 points (patients 1-4, 2-3, 5-6); 2 points (patients 1-5, 4-5), 1 point (patients 1-7, 5-8, 6-8). Of the 3 point pairs, 1 (5-6) was confirmed direct ward transmission by WGS (4 SNVs). None of the other patients were identified by whole-genome-sequencing as direct ward transmission. In 6 (75%) isolates, NDM was carried on plasmid pTR3 which is unique to Singapore, demonstrating endemic intra-country transmission.

Discussion & Conclusion:
Among NDM-1-EB in TTSH, the only direct ward transmission pair (confirmed by WGS) was detected by the reactive strategy. The Epi-score performed well in classifying the direct ward transmission pair in the highest relatedness category.

OP-CR-47

DEATH Score – A Novel Scoring System to Predict Mortality in Perforated Peptic Ulcers

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Background & Hypothesis:
Perforated peptic ulcer (PPU) is a common emergency gastric surgery, and is associated with significant morbidity and mortality. There are mortality risk prediction models (MRPM) that are used for risk stratification of patients, however, they are of moderate accuracy. Our primary aim is to develop a MRPM, derived from preoperative variables, which has a high specificity and sensitivity, that can be implemented easily, namely the DEATH score.

Methods:
This retrospective study comprises of 601 patients who underwent emergency PPU surgery in our institution from 2004-2012. Demographic factors, operative findings and surgical outcomes were collected. These data were analysed using univariate analysis. Ten statistically significant variables were assigned scores based on the multivariate analysis, and 6 models were derived and compared using receiving operating characteristic curve.

Results:
Of the 6 models derived, models with the American Society of Anesthesiology score (P <0.05) performed better than the rest. A final model excluded duplicating effect variables and scores were assigned using odds ratio (OR) for multivariate analysis. Age ≥65 (OR 2.1, 95% CI 0.98-4.66, 2 points), female gender (OR 1.89, 95% CI 0.91-3.91, 2 points), preoperative shock (heart rate >100/min and systolic blood pressure <100mmHg) (OR1.31, 95% CI 0.50-3.46, 2 points), elevated creatinine (>130 units) (OR 2.16, 95% CI 0.95-4.89, 2 points), elevated urea (>10 units) (OR 1.876, 95% CI 0.793-4.438, 2 points) levels and ASA score (OR 6.7, 95% CI 2.32-19.6, 7 points for ASA 3 and OR 22.2, 95% CI 7.31-64.41, 20 points for ASA 4/5). A score with range of 0-30 with a cutoff at 7 stratifies PPU patients at low and high risk of mortality with 94.2% sensitivity, 70.8% specificity, 99.2% negative predictive value, 23.9% positive predictive value and area under the curve of 90.9%.

Discussion & Conclusion:
We have generated a novel score – DEATH score which has the highest mortality prediction accuracy amongst all the existing scoring systems.

OP-CR-48

Non-Responders to Cardiac Resynchronisation Therapy with Defibrillator (CRT-D) – Too Big? Too Late?

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Background & Hypothesis:
The management of patients with heart failure represents a substantial economic burden and hospitalisation is responsible for >50% of the health care expense. Cardiac resynchronisation therapy with defibrillator (CRT-D) has long been proven to be highly beneficial for chronic heart failure patients, with reduction in mortality and rehospitalisations for heart failure. However, it is also well known that up to 30% of patients are non-responders to CRT-D. Current guidelines seem to lack more specific guidance on predicting non-responders.

Methods:
The purpose of this case series was to review the factors to predict non-responders to CRT-D and propose better selection of patients for the therapy.

Results:
Case 1: A 47-year-old male with known non-ischaemic cardiomyopathy (NICM), ECG-LBBB, QRS 133 ms, LVIDd 9.5 cm. EF 10%. Case 2: A 64-year-old male NICM. QRS 163 ms, LBBB (small q in I & v6), LVIDd 6.4 cm, EF <20%. Case 3: A 68-year-old male with ischaemic cardiomyopathy, CABG x4 2004, no reversible ischaemia on MPI, QRS 164 ms, interventricular conduction delay, LVIDd 6.8 cm, EF 20%.

Discussion & Conclusion:
This case series suggests electrocardiographic and echocardiographic data are of use to predict non-responders to CRT-D and this will be further validated by ongoing study at our institute.

OP-CR-49

Asian Data on the Safety of Bailout Stenting with Drug Eluting Stents after Paclitaxel-coated Balloon Angioplasty

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Background & Hypothesis:
There are safety concerns with the "double-dose" of antiproliferative drug in the same vessel segment when drug eluting stents (DES) are used to bailout a suboptimal paclitaxel-coated balloon (PCB) angioplasty result. We compared the safety of DES-PCB combination versus bare metal stent (BMS) plus PCB.

Methods:
We retrospectively evaluated patients requiring DES or BMS bailout following PCB angioplasty from 2011-2014. Clinical safety and bleeding complications at 1 year were analysed.

Results:
Twelve patients were treated with PCB + DES and 37 patients with PCB + BMS. The demographics of the 2 groups were comparable with a high percentage of diabetics (66.7% vs 56.8%; HbA1c 7.6% vs 6.7%). All PCB studied was sequent please with no difference in balloon size in the 2 groups (DES, 2.5 x 30.3 mm vs BMS, 2.6 x 28.8 mm, $P = 0.95$). DES and BMS size were similar (2.6 mm x 29.6 mm vs 2.6 mm x 25.2 mm, $P = 0.60$). PCB + DES group received longer dual antiplatelet therapy (12.0 vs 6.4 months, $P < 0.05$) but more TIMI minor bleeding (8.3% vs 2.7%, $P < 0.005$). There were no TIMI major bleeding reported. Major adverse cardiovascular event at 1 year in the PCB + DES group were comparable to PCB + BMS (8.3% vs 13.5%, $P = 0.63$), with no reported stent thrombosis in either group. There was less TLR in PCB + DES group (0% vs 8.1%, $P = 0.0001$).

Discussion & Conclusion:
Our initial experience using DES instead of BMS to bailout suboptimal PCB result appears to be safe with lower TLR at 1 year. Larger studies will be required to address long-term safety.

OP-CR-50

Marginal Ulcer Perforation: A Single Centre Five-Year Experience

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Background & Hypothesis:
Marginal ulcer or anastomotic ulcer is defined as ulcer at the margins of the gastro-jejunostomy (GJ), mostly on the jejunal side. Most marginal ulcers are managed medically but those with complications like bleeding or perforation require intervention. Different surgical options are offered for marginal ulcer perforation (MUP): omental patch repair, revision of GJ, etc. The aim of this case series is to study the clinical presentation and management of MUP.

Methods:
A total of 332 patients who underwent emergency surgery for perforated peptic ulcer over 5 years were studied. Their demographic, clinical and outcome data was collected and analysed.

Results:
Nine patients (2.7%) presented with MUP. Their median age was 71 years (range 44-80yrs) and the majority of patients were male (7/9, 77.8%). All patients previously had GJ done for complicated peptic ulcer or gastric malignancy. Only 2 have had anti-*H. pylori* regimen. The duration of abdominal pain was <24 hours in 4 (44.4%). Only 3 (33.3%) had free air on erect chest X-ray. Four patients (44.4%) had omental patch repair, 3 (33.3%) were repaired primarily, and 1 patient (11.1%) each had revision of GJ and jejunal serosal patch repair. There were no leaks, intra-abdominal abscess or reoperation; and no malignancies.

Discussion & Conclusion:
The aetiology of marginal ulcer is unclear. Several factors contribute: *H. pylori*, smoking, NSAIDs, local ischaemia and anastomotic tension. Omental patch repair is feasible in MUP. Biopsy of marginal ulcer is mandatory to exclude malignancy. Most studies reported in the literature are about postbariatric surgery patients; ours is perhaps one of the largest involving non-bariatric patients.

OP-CR-51

A Surgical Registrar-Led Management of Perforated Peptic Ulcer – Experience from a University-Affiliated Tertiary Hospital

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Background & Hypothesis:
Peptic ulcer is defined as breach in the mucosa of stomach or first part of duodenum due to corrosive effects of acid and pepsin. Although bleeding is the most common complication, perforation can lead to more catastrophic consequences. Emergency surgery for perforated peptic ulcer (PPU) includes variety of techniques, omental patch repair being the most common. The aim of this case series is to study the clinical presentation and management of PPU.

Methods:
A total of 332 patients who underwent PPU surgery over 5 years were studied. All the patients were operated upon by the surgical registrar-on-duty. Consultant surgeon-on-duty was only alerted when a gastric resection was performed. Demographic, clinical and outcome data were collected and analysed.

Results:
Median age of patients was 54.7 years (17-109 years) with male predominance (82.5%); 39.2% were smokers and 71% were treated for *H. pylori* infection. Chest X-ray revealed free air under diaphragm in 59.8%. Emergency exploratory laparotomy was done in all, except 3 in whom laparoscopic repair was performed. Majority were duodenal ulcers (77.1%); 88.6% patients had omental patch repair, 9.9% resectional surgery, 3 had ulcerectomy and 1 patient each jejunal patch and falciform ligament patch. Biopsy of ulcer edge was performed in gastric ulcers and malignancy was confirmed in 2 (3%). Intra-abdominal collection, leakage, reoperation and 30-day mortality rates were 8.1%, 2.1%, 1.2% and 7.2%, respectively.

Discussion & Conclusion;
Early presentation is peculiar to our system and likely explains the lower rates of pneumoperitoneum. With widespread adoption of routine laparoscopy, it is likely that surgical registrar-led management will also increasingly adopt laparoscopy.

OP-CR-52

Topical Timolol for the Treatment of Infantile Hemangiomas in Asian Children

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Background & Hypothesis:
We aimed to review a cohort of patients with infantile hemangiomas treated with topical timolol.

Methods:
Retrospective review of the medical records of children with infantile hemangiomas treated with topical timolol at the paediatric dermatology clinics, KK Women's and Children's Hospital with infantile hemangiomas treated with topical timolol from 2012-2014 was conducted.

Results:
A total of 66 patients with infantile hemangiomas were treated with topical timolol. There were 44 girls and 22 boys. The most common site was head/neck with 32 patients, followed by the trunk with 21 patients, upper limb with 11 patients and the lower limbs with 7 patients; 29 patients were treated using timolol 0.5% eye drops and 37 patients were treated using timolol XE 0.5% ophthalmic solution. The frequency for both treatments was twice to thrice daily. The median age at the start of treatment was 4 months old. Treatment outcome was graded as good (>50% reduction/growth arrest) for 35 patients (50%), moderate (25-50% reduction in size) for 8 patients (12%) and poor (<25% reduction/continued growth) for 17 patients (21%). There were 6 patients who defaulted follow-up. Those patients who were treated earlier at 2 to 3 months or had superficial lesions did better. The location and size of the lesions did not affect treatment outcome.

Discussion & Conclusion:
Topical timolol treatment of infantile hemangiomas remains a suitable treatment option despite the increasing trend towards oral propranolol. This is especially so for hemangiomas which are non-life threatening and non-functionally threatening. Parents may also be more comfortable with a topical as opposed to oral therapy.

OP-CR-53

Outcomes of Concomitant Upper Limb and Hip Fractures in the Elderly Population

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Background & Hypothesis:
Elderly patients with concomitant upper limb and hip fractures present a management dilemma because upper limb fractures potentially affect rehabilitation outcomes for the hip fracture.

Methods:
We retrospectively reviewed 1549 patients treated at a single trauma centre over 3 years. Twenty-nine patients had concomitant upper limb and surgically treated hip fractures. These patients were assessed on admission, postoperatively and at 6 months follow-up.

Results:
Amongst patients with surgically treated hip fractures and concomitant upper limb fractures, 44.8% had a proximal humerus fracture, 44.8% had a wrist fracture and 10.3% had an elbow fracture; 55.2% of these concomitant upper limb fractures were treated surgically. Surgically treated upper limb fractures had a shorter median length of stay (11.31 days vs 17.38 days, $P = 0.494$). Patients with concomitant shoulder fractures tend to have a longer mLOS (20.23 days) compared with patients having concomitant elbow or wrist fractures. With respect to improvements in Modified Barthel Index (MBI) at inpatient and 6 months postadmission, both surgical and conservatively treated upper limb fractures demonstrated improved scores. Conservatively managed shoulder fractures and surgically managed wrist fractures tend to demonstrate greater score improvements. There were no differences in inpatient morbidity or readmission rates between both groups.

Discussion & Conclusion:
Patient with surgically treated hip and concomitant wrist fracture demonstrated better functional outcomes at 6 months. Surgical treatment of concomitant upper limb fractures allows for decreased median length of stay.

OP-CR-54

Operative Outcomes in Centenarians with Hip Fractures

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Background & Hypothesis:
This study aims to report on the suitability of surgical management of hip fractures in the centenarian population.

Methods:
Thirteen patients met the inclusion criteria of over 100 years old and sustaining hip fractures (femoral neck, Intertrochanteric and subtrochanteric fractures). Restrospective review of data from case notes, electronic records and National Death Registry was done, including patient demographics, American Society of Anaesthesia score, Charlson's Comorbidity Index, ambulatory status and mortality data.

Results:
Ten women and 3 men with hip fractures (mean 102 years 4 months; range 100 years 1 month to 109 years 9 months) were identified. Six patients were treated operatively and 7 were treated non-operatively. Mean CCI was 1.00 in the operative group and 1.29 in the non-operative group ($P = 0.590$). Common postoperative complications include nosocomial pneumonia, iron deficiency anaemia and urinary tract infection. No major postoperative complications or deaths occurred during the inpatient stay in the operative group. Mortality rates at 30-day, 90-day, 6-month, and 12-month were lower in the operative group at 0%, 0%, 16.7% and 33.3% compared to 14.3%, 28.6%, 42.8% and 57.1% in the non-operative group. Five patients (83%) in the operative group who were ambulant pre-injury had a minor reduction in ambulatory status to ambulation with walking aids, while only 1 out of 4 previously mobile patients of non-operative group was ambulant with walking aids.

Discussion & Conclusion:
This study shows that the centenarian hip fracture population is not necessarily high surgical risk patients but experienced a lower mortality rate and better postoperative ambulatory status.

OP-CR-55

Comparing Outcomes of Standard- and Reduced-Fluence Photodynamic Therapy in the Treatment of Polypoidal Choroidal Vasculopathy

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Background & Hypothesis:
EVEREST study reported favourable polyp closure rates in polypoidal choroidal vasculopathy (PCV) using standard-fluence Verteporfin photodynamic therapy (sPDT). However, optimal PDT protocol remains controversial. Some authors suggest that reduced-fluence PDT (rPDT) has comparable efficacy while reducing collateral damage to adjacent healthy retina and choroid. We compared efficacy and safety of sPDT to rPDT in PCV treatment.

Methods:
Retrospective review of all PDT-naive PCV cases treated with PDT between January 2011 and December 2013 was conducted.

Results:
Thirty-seven eyes of 37 patients (24 males and 13 females) with an average age of 69.9 years (range 50-89, SD ± 8.9) were followed for a mean duration of 22.5 months (range 6-48). Of these, 29 (78.4%) were treated using sPDT while 8 (21.6%) had rPDT. Patients treated using rPDT had better visual acuity (VA) outcomes compared to sPDT at 6 months (mean LogMAR 0.22 vs 0.56), 12 months (mean LogMAR 0.23 vs 0.48) and 24 months (mean LogMAR 0.40 vs 0.65). Disease recurrence rate was similar between both treatment groups (58.6% recurrence in sPDT vs 37.5% in rPDT, $P = 0.382$), but time to disease recurrence was significantly shorter in sPDT than rPDT (10.9 vs 20.3 months). No difference in the need for additional antivascular endothelial growth factor (VEGF) injections (5.6 vs 4.8) post-PDT between both groups. No significant adverse events were reported.

Discussion & Conclusion:
rPDT as a treatment alternative resulted in better VA outcomes, comparable recurrence rates and need for additional anti-VEGF injections, while having longer time to disease recurrences.

OP-CR-56

Does Gastrectomy with Systemic Chemotherapy Improve Survival Outcomes in Patients with Metastatic (Stage 4) Gastric Cancer? A Propensity Score Matched Case-Control Study

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Background & Hypothesis:
The aim of this study is to investigate the survival benefits of gastrectomy with systemic chemotherapy over chemotherapy-alone in the patients diagnosed with metastatic gastric cancer.

Methods:
Patients with newly diagnosed metastatic stage 4 cancer divided into gastrectomy with systemic chemotherapy group (n = 136) and chemotherapy-alone group (n = 407). In view of potential selection bias and confounding effects between 2 groups, propensity score matching was used to reduce the bias. After matching of age, gender, body mass index, performance score, albumin, peritoneal metastasis, distant lymph node metastasis, liver metastasis, lung metastasis, bone metastasis, ovary and other organs metastasis, number of organs/system metastasis, 120 patients in each group were selected for final analysis.

Results:
The median overall survival in matched cohort was 18.13 months (95% CI 13.088-23.17) versus 11.8 months (95% CI 9.528-14.072) in surgery group and chemotherapy-alone group, respectively. The 2-year overall survival rate was also higher in surgery group (42% versus 30%). The 30 days mortality was zero and morbidity rate was 18.3% (22/120) in the surgery group. Multivariate analysis of surgical group showed that poor differentiation of tumour, vascular invasion, and metastatic lymph node ratio are factors associated with poor survival outcomes in the surgery group.

Discussion & Conclusion:
The gastrectomy with chemotherapy can improve overall survival in selected patients with newly diagnosed metastatic gastric cancer. Surgery can be performed safely with acceptable morbidity and mortality in experienced centres. Well designed prospective clinical trials are still needed to confirm our observations.

OP-CR-57

Bariatric Surgery: Tan Tock Seng Hospital's Experience

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Background & Hypothesis:
Obesity is the fourth most prevalent disease burden among adults in Singapore. The rising trend of bariatric surgeries is also observed in Singapore.

Methods:
The study is a retrospective review of patients who underwent bariatric surgeries from November 2008 to December 2013 in Tan Tock Seng Hospital, Singapore's second largest acute care general hospital with over 1500 beds.

Results:
A total of 152 patients who underwent SG, sleeve gastrectomy (n = 90, 59.2%) and RYGB, Roux-en-Y gastric bypass surgeries (n = 62, 40.8) were included in the study; 50% (n = 45) were female in SG and 64.5% (n = 40) in RYGB. Preoperative BMI was 43.13 +/- 8.23 in SG and 40.63 +/- 6.31 in RYGB (P = 0.046). Mean age of the patients was 39.9 +/- 11.89 in SG versus 48.73 +/- 8.69 in RYGB (P <0.001); 30% (n = 27) have diabetes in SG and 83.9% (n = 52) in RYGB (P <0.001). The leakage was observed in 3.3% (n = 3) in SG and 3.2% (n = 2) in RYGB (P = 1). There was no 30 days mortality in both groups. The mean operative time of SG was shorter than RYGB group: 144.61 (42.57) vs 207.43 (58.88) (P <0.001). The mean percent excess BMI loss at 1 year was 73.6 +/- 38.35 in SG compared to 70.3% (29.34) in RYGB (P = 0.608).

Discussion & Conclusion:
Our study shows comparable results to those reported in the literature. In our cohort, the mean percent excess BMI loss were comparable between SG and RYGB group at 3 months, 6 months and 12 months postsurgeries. Long-term follow-up is needed to confirm our findings.

OP-CR-58

Plasma apoCIII is Independently Associated with Peripheral Neuropathy in Patients with Type 2 Diabetes (T2D)

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Background & Hypothesis:
Diabetic peripheral neuropathy (DPN) is a common complication of diabetes. Apart from hyperglycaemia, its pathogenesis is poorly understood. Apolipoprotein CIII (apoCIII) associated with triglyceride metabolism, is a risk factor for cardiovascular disease. Its role in microvascular disease and DPN is not well established. We studied the associations of apoCIII with DPN.

Methods:
We consecutively enrolled patients with T2D (21-90 years old), seen in KTPH Diabetes Centre and a polyclinic in Singapore (August 2011-March 2014). Anthropometric data, fasting blood, urine were collected for biochemistry and urine albumin/creatinine measurements (uACR). Endothelial function assessments were performed by laser Doppler flowmetry/imaging. Neuropathy was considered present if an abnormal finding in monofilament (≤ 8 of 10 points) or neurothesiometer testing ≥ 25 volts on either foot. Plasma apoCIII was assessed by ELISA.

Results:
Monofilament and neurothesiometer readings were measured in 1981 patients. DPN prevalence was 10.8% (n = 214). Longer diabetes duration 15.0 (8.0-23.5) vs 9.0 (5.0-15.0) years, male gender [(63.1 vs 49.0)%], Malay ethnicity, higher BMI [28.6 (5.7) vs 27.6 (5.2)]kg/m^2, HbA1c [8.2 (1.5) vs 7.7 (1.3)]%, SBP [146.0 (20.6) vs 137.6 (18.7)] mmHg, uACR [134.0 (25.5-852.5) vs 21.0 (6.0-81.0)] mg/g, lower eGFR [68.2 (36.3) vs 86.9 (32.0)] ml/min/1.73 m^2, poorer endothelial function and higher apoCIII [285.3 (195.2-405.6) vs 242.9 (165.0-344.0), *P* = 0.002] µg/ml were significant in patients with DPN. After adjustment, Malay ethnicity, endothelial dysfunction, higher uACR and higher apoCIII (B = 1.038, SE = 0.497, *P* = 0.037) remained significant in DPN patients.

Discussion & Conclusion:
Plasma apoCIII is higher in patients with DPN. Apart from its known association with lipids macrovascular complications, this study suggests its association with microvascular disease (DPN). The pathobiological basis and temporal relationships of these associations need to be explored by mechanistic and prospective studies before we can consider therapeutic potential of apoCIII lowering in these patients.

OP-CR-59

Childhood Trauma is Associated with White Matter Integrity Disruption in the Right Parahippocampal Cingulum and Left Uncinate Fasciculus

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Background & Hypothesis:
Childhood trauma is highly prevalent in adolescents who later develop psychiatric conditions. Nevertheless, no study has assessed the impact of abuse/neglect on brain white-matter (WM) in populations at-risk for psychosis. We tested the hypothesis that lower WM-integrity is associated with early trauma and subclinical psychotic symptoms in adolescents at-risk for psychosis (UHR).

Methods:
Eighty-seven UHR and 37 healthy controls (HC), aged 14-29, were recruited from the community and assessed by Structured Clinical Interview for DSM-IV Axis-I disorders and Comprehensive Assessment of At-Risk Mental State (CAARMS). UHR participants were further assessed by Positive and Negative Syndrome Scale and Child Trauma Questionnaire. Diffusion-weighted images were acquired on all the participants to derive region-wise mean fractional anisotropy values of 20 WM tracts. MANCOVA and stepwise regression models were computed to probe for WM-integrity disruption in UHR and explore its association with trauma, subclinical psychotic symptoms and non-psychotic psychopathology.

Results:
Compared to HC, UHR participants showed lower anisotropy in the left uncinate fasciculus (LUF) ($P = 0.020$) and right parahippocampal cingulum (RPC) ($P = 0.015$) after controlling for age, gender and ethnicity differences. Participants with lifetime SCID diagnosis showed lower anisotropy in both tracts when compared to HC ($P = 0.013$ and $P = 0.040$). The lower the LUF anisotropy, the more severe the emotional abuse reported ($P = 0.026$). The lower the RPC anisotropy, the more severe the subclinical symptoms ($P = 0.024$).

Discussion & Conclusion:
Our findings suggest that the clinical impact of early trauma may be mediated by WM-integrity disruption of the uncinate fasciculus and parahippocampal cingulum: tracts connecting limbic structures involved in memory and emotional processing.

OP-CR-60

Modelling Renography Data for Quantitative Means in Differentiating Kidney Obstructions

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Background & Hypothesis:
Renal outflow obstruction is a commonly seen condition clinically. In order to detect the severity of blockage, renography technique is often used. However, there is no accurate quantitative technique and procedure used in clinical setting. In response to this issue, this project has the objective to search for a non-invasive method of analysing the renal obstruction and to develop a standard method of determining the severity of kidney blockage.

Methods:
In compartmental modelling analysis, the behaviour of the tracer was represented from the input into the kidney to the outflow out of the kidney. The rate of flow in and out of the kidney was classified by support vector machine (SVM) and random forest (RF) classifier.

Results:
The results were compared with actual clinical prediction by a certified nuclear medicine doctor and the results showed a 98.75% accuracy with only 1 mismatch out of 80 kidneys.

Discussion & Conclusion:
Since the accuracy of this experiment is 98.75%, this non-invasive technique of determining the conditions of a patient's kidneys could be used in the future clinical setting as it gives an objective and non-bias results that will be solely based on mathematical expression, calculations and classification systems.

OP-CR-61

Investigation of Lesion Detection for Lung Cancer Screening with Low Dose PET/CT

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Background & Hypothesis:
Screening with low dose computed tomography (CT) of high-risk patients has been shown to detect lung cancer earlier compared to chest X-rays. We investigate here low dose positron emission tomography (PET)/CT for more accurate screening.

Methods:
PET/CT data from 13 lung cancer patients were acquired. Patients were scanned on the Siemens mCT with 2 bed positions over the thorax, for 10 minutes each, after a 5.9 ± 0.1mCi FDG injection and 63 ± 3.1 minute uptake period. Resulting scans comprised 119.2 ± 26.1M (2-bed mean) true coincident events. Four patients presented 5 isolated, solid nodules with mean volume 1.3 ± 1.4 cm^3 and mean SUV 3.0 ± 2.4. The reproducibility of the lesion activities were investigated for various noise levels. Reduced doses were simulated by randomly discarding events in the PET list mode according to 10 desired count levels from 50 × 106 down to 0.25 × 106. Fifty realisations at each simulated dose were generated and reconstructed with OP-OSEM incorporating resolution modelling and time-of-flight.

Results:
Accurate quantification and reproducibility were evaluated as a function of true acquisition counts. With the reduction of count statistics, an increase in variance was observed in the lesion activity measurements. Reducing the dose, increases image noise and uncertainty in the SUV value and decreases detectability of small lesions. The data presented here point to a lower limit around 10 million true counts.

Discussion & Conclusion:
In this preliminary work, the PET tracer dose could possibly be reduced over 11-fold, potentially bringing patient exposure to <1 mSv. More work is required to validate these findings in a clinical context.

OP-CR-62

The Efficacy of Routine Magnetic Resonance Imaging in Suspected Pathological Fractures of the Extremities

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Background & Hypothesis:
Magnetic resonance imaging (MRI) has been the gold standard radiological modality for investigating suspected pathological fractures. Though prudent to investigate as management of pathological and non-pathological fractures differ, the routine use of MRI also has its drawbacks. Our objective was to determine if routine MRI scans are necessary for all cancer patients with extremity fractures.

Methods:
A 2-year retrospective study was conducted reviewing all extremity MRI scans performed for suspected pathological fractures. All subjects included in this study had an extremity fracture, a known diagnosis of cancer and an MRI to determine if the fracture was pathological. Demographic data, cancer history and remission rates, history of trauma preceding fracture, ambulatory status, X-ray findings and MRI findings were then collected and analysed using SPSS.

Results:
A total of 69 subjects were recruited; 21 subjects had pathological fractures and 48 subjects had non-pathological fractures. Trauma-related injuries were noted in 53.6% of non-pathological fractures compared to 8.7% in pathological fractures ($P < 0.05$). X-rays were 97.2% accurate when compared to MRI scans in differentiating pathological and non-pathological fractures. Sixteen subjects were in remission and only 1 subject had a pathological fracture due to radiation. None of the 16 in remission had a fracture from cancer recurrence.

Discussion & Conclusion:
Our study suggests that the routine use of MRIs to evaluate for pathological fractures in patients with a cancer history is debatable. The history of significant trauma, solid cancers in remission, and lack of suspicious features on plain radiographs, effectively predict for the absence of pathological fractures.

OP-CR-63

Singapore ARDS Practices and Outcomes (SAPOS) Study

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Background & Hypothesis:
Acute respiratory distress syndrome (ARDS) is a condition associated with a high mortality and is difficult to manage. We wished to study the: 1) prevalence 2) mortality and 3) management practices of ARDS in Singapore by means of a prospective, observational cohort study over 1 month in all ICUs of Singapore public hospitals.

Methods:
After obtaining IRB approval, we used a data collection form to identify and collect variables of all patients that fit the Berlin classification criteria for ARDS. We also sent a questionnaire to all intensive care physicians to obtain their management preferences of ARDS patients.

Results:
Sixteen patients were identified as having ARDS in 1 month. The prevalence of ARDS in Singapore is 0.4 cases per 100,000 population and 1.76% of all ICU patients (904). Our average age was 58 years and average APACHE II score was 32. Our overall mortality during the study period was 15% or 2 patients and no other complications were reported. Our average length of stay was 1 week. The majority of physicians claimed to be using low tidal volume, high peep strategies as recommended by ARDS network as well as neuromuscular blockers.

Discussion & Conclusion:
This is the first nationwide cohort study in Singapore ICUs on ARDS. Even though our mortality is lower than international rates, our numbers are too low to reach a conclusion. One aspect of the management which stands out is the non-compliance with established ARDS network strategies of lung protective ventilation.

OP-CR-64

Incidence and Bacteriology Profile of Infectious Complications in Barbiturate Coma Therapy

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Background & Hypothesis:
Bone marrow suppression, leucopenia and infectious complications have been reported during the use of barbiturate coma therapy (BCT) for refractory intracranial hypertension. However, these studies have mainly involved small sample sizes. Thus, although effective in lowering intracranial pressure, barbiturate-mediated infections may severely limit the potential life saving utility of BCT.

Methods:
We conducted a retrospective cohort study of all patients (n = 72) receiving thiopentone BCT for the control of refractory intracranial hypertension in a neurosurgical intensive care unit from January 2008-December 2012. We collected data including changes in cell count, procalcitonin levels and incidence of clinically diagnosed infections. The microbiological profile of the organisms isolated and antibiotics prescribed were also analysed.

Results:
The mean pre-induction WBC count was $15.1 \pm 12.2 \times 10^9$L; 91.7% of patients experienced a decrease in WBC count after induction with a mean maximal decrease in white cell count of 9.15×10^9L. The incidence of leucopenia and neutropenia were 34.7% and 2.8%, respectively. Procalcitonin levels were generally raised as early as first day of BCT. The incidence of clinical infections was 46.2%. Pneumonia (n = 15) and blood stream infections (n = 9) accounted for majority of the infections. The main causative organisms causing pneumonia were *Klebsiella pneumonia* (n = 4), *Staphyloccus aureus* (n = 2) and *Pseudomonas aeruginosa* (n = 2). The main cultured organisms from blood stream infections were *Pseudomonas aeruginosia* (n = 3), *Klebsiella pneumonia* (n = 1), *Enterococcus cloacae* (n = 1) and *Acinetobacter baumannii* with *Staphyloccus aureus* (n = 1). Out of 40 positive cultures, *Klebsiella pneumonia* (n = 14, 1 was multiresistant) and *Staphyloccus Aureus* (n = 9, 4 were methicillin-resistant) constituted the commonest bacteria isolated.

Discussion & Conclusion:
Leucopenia and infections (predominantly pneumonia) are common complications in patients on BCT for refractory intracranial hypertension.

OP-CR-65

A Novel Scoring System to Predict Mortality in Elderly Patients with Perforated Peptic Ulcer

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Background & Hypothesis:
Emergency surgery for perforated peptic ulcer (PPU) in the elderly is associated with high morbidity and mortality. Existing scoring systems lack simplicity and objectivity and are not routinely used. A customised scoring system for elderly would aid management and can improve outcomes. We validate existing scoring systems and derive a novel scoring system.

Methods:
A total of 170 patients with age >70 years and operated for PPU at Tan Tock Seng Hospital from January 2004 to December 2012 were recruited. Preoperative, operative and postoperative data were collected. Boey's score and Mannheim peritonitis index (MPI) are commonly used and validated. Univariate and multivariate analyses of mortality predictors were performed and a novel scoring system obtained by logistic regression and assigning weightage to variables equivalent to odds ratio.

Results:
A total of 95 (55.9%) patients were male, with 111 patients (65.3%) presenting >24 hours after abdominal pain onset; 68 (40%) patients have comorbidities and 95 (55.9%) showed free air on erect chest X-ray. Median length of stay was 12 days (1-128). Intra-abdominal collection, leakage, reoperation and mortality were 15.9%, 5.3%, 1.8% and 19.4% respectively. Boey's score, and MPI had areas under curve (AUC) of 64.4% and 63%, respectively for mortality prediction. A new scoring system with weightages (congestive cardiac failure: 4, preoperative shock: 3, urea >15: 4, creatinine >130: 3, ASA 3: 11, transfusion: 4, total parenteral nutrition: 3, intensive care unit requirement: 10) had 75.4% AUC (minimum score 0, maximum score 42) with better sensitivity (95.7%).

Discussion & Conclusion:
Mortality following PPU is high in elderly and existing scoring systems have poor predictive accuracy. We propose the use of our novel scoring system to aid clinical practice.

OP-CR-66

Cross Diagnostic Comparisons of Quality of Life Deficits in Remitted and Unremitted Patients with Schizophrenia and Bipolar Disorder

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Background & Hypothesis:
Patients with schizophrenia (SCZ) and bipolar disorder (BD) have been found to report lower quality of life (QOL) compared to healthy controls separately. However, data are wanting on cross diagnostic comparisons of QOL within psychotic spectrum conditions. This study examined QOL differences and clinical predictors between remitted and unremitted SCZ and BD patients. Based on extant data, we hypothesised that patients with remitted SCZ and BD had comparable QOL levels, and that more severe symptoms and poorer psychosocial functioning predicted poorer QOL in our patients.

Methods:
A total of 222 subjects (44 BD with psychotic features, 122 SCZ, 56 healthy controls) were assessed on QOL, psychosocial functioning, symptomatology, and state of remission. One-way ANOVA was used to compare QOL between all 3 groups. Independent samples t-tests and ANCOVA controlling for marital and employment status were used as appropriate to compare QOL between remitted and unremitted patients. Multiple linear regression analysis was used to determine clinical predictors.

Results:
Overall, SCZ patients had worse QOL in the environment domain compared with BD patients (P <0.01). Both patient groups in remission had similar QOL, while unremitted SCZ patients reported poorer QOL in all domains compared to unremitted BD patients (P <0.01). Greater severity of negative symptoms was associated with poorer QOL (P <0.01).

Discussion & Conclusion:
Remission status affected QOL in both patient groups. The association of greater negative psychotic psychopathology with worse QOL highlighted a potential clinical marker of QOL which can aid in the management of psychotic spectrum disorders.

OP-CR-67

Is the Intertrochanteric Fracture Evolving? Trends in the Elderly Population over a 10-Year Period

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Background & Hypothesis:
The objective of this study was to analyse possible trends in the morphology and demographics of intertrochanteric fractures of the hip in the elderly population, as well as surgical fixation patterns for these fractures between 2004 and 2013.

Methods:
A retrospective cross-sectional comparison was undertaken for the first 100 consecutive elderly patients with intertrochanteric fractures admitted to our tertiary institution in each of the years 2004, 2007, 2010 and 2013. Fractures were classified via the Evans and AO classifications. Patient demographics and surgical data were collected via case notes review.

Results:
The mean age of the patients treated in 2004 was 79.6 years, 79.5 years in 2007, 79.7 years in 2010 and 81.6 years in the last group of patients analysed in 2013. There was no difference in the gender distribution between the first 3 study years, but there was a steep increase in the number of male patients with intertrochanteric fractures between 2010 (32%) and 2013 (46%). The main finding was a rise in the proportion of unstable intertrochanteric fractures. The proportion of such fractures was 41% in 2004, 51% in 2007, 49% in 2010 and 56% in 2013 ($P = 0.040$). We have also uncovered an increasing trend towards early fracture fixation ($P = 0.007$), and a greater usage of intramedullary nailing devices in the treatment of such fractures in recent years.

Discussion & Conclusion:
Intertrochanteric fractures in elderly patients have evolved into more complex fractures over the past 10 years. This may likely to be due to our aging population and more severe osteoporosis.

OP-CR-68

Efficacy of Open Thrombectomy versus Percutaneous Thrombolysis for Occluded Arteriovenous Fistulae

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Background & Hypothesis:
Arteriovenous fistula (AVF) thrombosis is a common complication of haemodialysis. Currently, there are no randomised controlled trials comparing open thrombectomy (OT) with thrombolysis (AVF-T). Guidelines suggest that treatment be institution-based.

Methods:
We performed a retrospective study to evaluate the patency rates following OT between March 2011 to March 2015, and AVF-T between March 2013 to March 2015. Patients were reviewed from their first thrombosis until May 2015 or until a new access was required. Primary patency was defined as successful cannulation postintervention, and secondary patency was defined as time to repeat thrombosis.

Results:
Thirteen patients underwent OT and 55 patients underwent AVF-T. Both groups had similar baseline characteristics. Primary patency was 53% (7/13) after OT vs 80% (44/55) after AVF-T (P = ns). Secondary patency was superior post OT, with a longer mean thrombus-free period of 546.7 ± 537.0 vs 268.6 ± 199.9 days post AVF-T (P <0.05); 28% (2/7) in the OT group vs 48% (18/37) in the AVF-T group required repeat interventions for recurrent thrombosis (1 intervention in the OT group vs 1.94 ± 0.87 in the AVF-T group, P = ns); 69% (9/13) post OT patients vs 61% (34/55) post AVF-T patients eventually required new accesses (P = ns). There were no complications for patients in the OT group vs 21% (12/55) in the AVF-T group (P = ns). Moreover, hospitalisation stay was significantly shorter in the OT group vs the AVF-T group (mean 7.3 ± 3.4 days vs 10.0 ± 4.8 days, P <0.05).

Discussion & Conclusion:
OT is as effective as AVF-T in the initial management of AVF thrombosis with significantly better secondary patency rates and shorter hospitalisation. Though statistically insignificant, fewer repeat interventions were required following OT. Hence, OT should be considered as the preferred management for the treatment of AVF thrombosis in our centre.

OP-CR-69

Predicting Response to Treatment in IgA Nephropathy Using Oxford Classification

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Background & Hypothesis:
Oxford classification (OxClass) of IgA nephropathy (IgAN) identified mesangial hypercellularity (M), endocapillary hypercellularity (E), segmental glomerulosclerosis (S) and tubular atrophy/interstitial fibrosis (T) as independent prognostic factors. However, it is unclear if the OxClass can be utilised to guide treatment. We hypothesise that the M, E, S or T lesion predicts response to treatment in IgAN.

Methods:
We retrospectively reviewed all patients with biopsy-proven IgAN between 2011 and 2014 in our centre, and assessed the reduction of proteinuria before and after treatment in relation to OxClass.

Results:
A total of 63 patients (52.4% male; mean age 44.5 ± 15.9 years; 82.5% Chinese, 11.1% Malay, 1.6% Indian, 4.8% Others) were included in the study. At biopsy, the estimated glomerular filtration rate and proteinuria was 72.0 (47.0, 92.0) ml/min/1.73 m^2 and 2.2 (1.4, 2.9) g/day respectively. On histological examination, 34.9%, 69.8% and 85.7% of patients had M1, E1 and S1 lesions respectively, and 73%, 22.2% and 4.8% of patients had a T score of 0, 1 and 2 respectively. All except 1 patient received renin-angiotensin blockade, and 37 patients (57.8%) received immunosuppression. At a mean follow-up duration of 22.7 ± 14.4 months, proteinuria was significantly lower at 1.0 (0.5, 2.4) g/day ($P = 0.002$). Patients with E0, S0 and T0 lesions who received immunosuppression had significant reduction of proteinuria from 2.3 (1.5, 2.6) to 0.9 (0.7, 1.7) g/day ($P = 0.036$), 2.2 (1.9, 3.8) to 1.3 (0.5, 2.4) g/day ($P = 0.043$) and 2.5 (2.2, 3.0) to 1.1 (0.5, 2.5) g/day ($P = 0.012$) respectively; however, patients with E1, S1 and T1/2 lesions who received immunosuppression showed no significant reduction in proteinuria at follow-up. M lesions did not predict response to immunosuppression.

Discussion & Conclusion:
In our study, OxClass predicted response to immunosuppression in IgAN and may potentially be used to guide treatment in IgAN.

OP-CR-70

Designing a Mobile Imaging System for Early Melanoma Detection

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Background & Hypothesis:
Skin cancer screening, especially for melanoma, is of vital importance, as early diagnosis improves treatment outcome. Increasingly, mobile phones are equipped with powerful central processing units (CPUs) and high resolution image sensors. This technology creates an opportunity to use a mobile phone to analyse user-captured images for self-screening and melanoma detection. The system can potentially be used by the general public and general practitioners for preliminary screening. Our project combines medical, computation, biology, design and healthcare research expertise.

Methods:
NSC and SUTD collaborated on this study. Preliminary evaluation of the system was based on a dataset of 175 digital images, including 67 images of biopsy-proven malignant melanoma (MM) and 108 images of clinically benign nevi. Thirty-seven of the MM were acral lentiginous, the most common subtype in Asian population. Our study utilises new low-complexity image analysis and machine learning algorithms to assess morphological and chromatic features of a skin lesion. The technology provides a novel assessment algorithm based on pigmented lesion segmentation, and new computational tools for the automatic selection of discriminative features.

Results:
In the preclinical phase of this study, our system has reported an overall 85.6% sensitivity and 84.8% specificity for melanoma detection.

Discussion & Conclusion:
The preclinical phase of this study shows that our novel mobile imaging system provides a robust and remarkably accessible tool for the purpose of melanoma screening in an Asian context. The subsequent clinical phase of this study will allow us to investigate the utility of the system.

OP-CR-71

Predictors and Clinical Significance of Metachronous Contralateral Breast Cancers

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Background & Hypothesis:
Women with breast cancer are at a higher than average risk of developing contralateral breast cancer. This underlies the rationale for yearly surveillance mammogram in breast cancer survivors. We aim to evaluate the prevalence of metachronous contralateral cancers (defined as cancers developing in the contralateral breast more than 6 months after the initial treatment for primary tumour) to identify its predictive factors and to assess its impact to clinical outcome.

Methods:
A retrospective review of patients treated for breast cancer at our institute between 1 January 2001 to 31 December 2010 was conducted. Majority had at least 5 years of follow-up.

Results:
Metachronous contralateral breast cancers developed in 79 of 1933 (4.1%) patients. The median interval to diagnosis of metachronous cancers was 51 months (ranging from 12-131 months) after initial treatment of the primary breast cancer. More than half the cancers (46 of 79) developed within the first 5 years. Only about 14% (11 of 79) were detected on the surveillance mammogram. The majority (85.7%) were detected by the clinician on clinical examination or were reported by the patient. Symptomatic primary tumours ($P = 0.02$) and those with extensive nodal involvement ($P <0.01$) were more likely to develop contralateral cancers. Metachronous cancers are associated with poorer long-term survival ($P <0.01$).

Discussion & Conclusion:
Metachronous contralateral breast cancers occurred in 4% of our patients and often occurred within first 5 years of diagnosis of the initial unilateral cancer. Symptomatic cancers and extensive nodal involvement were associated with higher likelihood of developing metachronous cancers. Metachronous breast cancers had an adverse impact on long-term survival.

OP-CR-72

Ethnic Variations in the Anatomy of the Saphenous Fascia in Singapore

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Background & Hypothesis:
Endothermal ablation of the great saphenous vein (GSV) is a common procedure. The GSV is enveloped within the saphenous fascia that is described variously as extending from the inguinal confluence to the ankle. We describe our observations regarding ethnic variations in saphenous fascia anatomy on ultrasound scanning.

Methods:
The extent of the fascia around the GSV on ultrasound scanning (USS) was recorded during 442 consecutive endovenous radiofrequency procedures for GSV incompetence. The fascia was mapped from the groin to the medial malleolus, and adjudged as complete if seen to be fully formed from the groin to the ankle, incomplete if present only in the above knee segment and absent if not identified at all. Patients were classified into Chinese, Indian, Malay, Caucasian and Mixed ethnicity.

Results:
Fascial anatomy was recorded in 161 patients (322 legs) and 120 unilaterally. The ethnic distribution of patients is shown in the table below; 95% of Chinese, 68% of Indian and 50% of Malay patients had a formed saphenous fascia only above the knee, compared to only 11% of Caucasian and 27% of patients of mixed ethnicity. A high degree of concordance was observed between the right and left sides in the anatomy of fascial distribution in all races. No patient was found to have absent saphenous fascia.

Discussion & Conclusion:
The saphenous fascia shows significant ethnic variations among Asian races compared to Caucasian patients. This has implications in the technique of administration of tumescent anaesthesia and prevention of perivenous thermal injury during endothermal ablation.

OP-CR-73

Investigation of In Vitro Platelet Reactivity by Flow Cytometry

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Background & Hypothesis:
Acute Coronary Syndrome (ACS) represents a major healthcare burden and remains amongst major causes of death worldwide. Thrombotic and haemostatic problems involving platelets is an integral part of disease progression not only in cardiovascular diseases but also in other high burden diseases such as cancer and diabetes. There are growing evidences which suggest that platelet hyper-reactivity contributes to ischaemia in atherothrombosis. Upon platelet activation, a conformation change in the fibrinogen receptor GP-IIb-IIIa (detected by PAC-1 binding) and platelet degranulation (as measured by P-selectin) occur. This project aims to examine the in vitro platelet reactivity in response to agonists of the normal healthy population using flow cytometry.

Methods:
Twenty whole blood samples were collected in 3.2% sodium citrate from healthy donors. Fresh samples were processed within an hour of collection. Circulating platelet activity and in vitro platelet activation by various agonists at predetermined concentrations were measured by flow cytometric determination of PAC-1 binding and platelet surface expression of P-selectin. Platelet reactivity and dose response curves were established for agonists used.

Results:
Our preliminary results showed that the mean circulating level of platelet surface P-selectin expression and PAC-1 binding were 2.7Â ± 0.9% and 10.2Â ± 3.6% respectively. Platelet reactivity as stimulated by agonists varied considerably between different individuals.

Discussion & Conclusion:
Circulating platelet activity has been previously reported to correlate with thrombo-inflammatory diseases such as ACS. Our study provided baseline of platelet reactivity among healthy population. Further study to compare platelet reactivity in patient groups such as ACS patients to healthy population may help stratify the thrombosis risk among patients.

OP-CR-74

Impact of the Diagnostic and Statistical Manual of Mental Disorders (DSM-5) Criteria on the Prevalence of Neuropsychiatric Symptoms (NPS) Occurence and Caregiver Burden

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Background & Hypothesis:
With an aging population, the prevalence of dementia is expected to increase exponentially. DSM-V criteria (2013) sought to better characterise dementia and predementia stages. This study examines the impact of DSM-V criteria on the prevalence of NPS and caregiver burden.

Methods:
This cross-sectional study involved 129 older adults attending the Memory Clinic. Patients were diagnosed as DSM-IV dementia or MCI (International Working Group mild cognitive impairment), with subsequent application of DSM-V for major neurocognitive disorder (MNCD) and mild neurocognitive disorder (mNCD). Neuropsychiatric Inventory Questionnaire (NPI) and Zarit Burden Interview (ZBI) were used to assess the prevalence of NPS and caregiver burden respectively.

Results:
The mean age of patients was 73.95 + 7.42 years, with female (55%) and Chinese (90.7%) predominance. The prevalence of MNCD (82.9%) was higher than DSM-IV dementia (62.8%). We observed higher prevalence of all NPS in DSM-IV dementia than MNCD except for irritability (38.3% vs 39.3%). DSM-V criteria groups each had lower ZBI scores (mNCD and MCI: 27.36 + 15.74 vs 25.82 + 16.22; MNCD and MCI: 17.6-0 + 14.84 vs 14.71 + 11.25; MNCD and dementia: 20.67 + 19.01 vs 13.20 + 16.21). MCI-MNCD and dementia-MNCD groups are more similar to each other than to MCI-mNCD. There was progression of ZBI score from MCI-mNCD, MCI-MNCD to dementia-MNCD (15.13 + 11.78 vs 19.58 + 15.94 vs 27.36 + 15.74).

Discussion & Conclusion:
With lower prevalence of most NPS within the MNCD group, the criteria change appears to better capture disease complications and caregiver burden and characterise early stages of cognitive impairment better.

OP-CR-75

The Use of Cone-Beam CT in Achieving Unipedicular Spinal Augmentation

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Background & Hypothesis:
We aimed to assess the feasibility of cone-beam computed tomography (CBCT) in achieving unipedicular access during spinal cement augmentation.

Methods:
International board review was obtained; a retrospective review of all patients who underwent CBCT-guided unipedicular spinal augmentation procedures between 1 January 2012 and 15 June 2015 was performed. Fifty-nine patients (43 women, 16 men; mean age, 74 years; range, 52-90 years) underwent unipedicular spinal augmentation in 78 vertebral levels (T5-T9, n = 14, T10-L2, n = 42, L3-L5, n = 22). Aetiologies include osteoporosis (n = 60), metastases (n = 13) and multiple myeloma (n = 5). Degree of crossover in contralateral hemi-vertebral body, complications and 30-day mortality were recorded.

Results:
Ninety-five percent (74/78) of procedures (stentoplasty n = 55, kyphoplasty n = 13, vertebroplasty n = 6) were technically successful. Two procedures (kyphoplasty n = 1, stentoplasty n = 1) failed due to vertebral sclerosis; 2 kyphoplasty procedure required the second pedicle (bipedicular) after midline crossover of cement failed. For vertebroplasty, all cases (6/6) demonstrated crossover filling of cement, and 50% (3/6) showed cement crossover >50% of contralateral half. For kyphoplasty, all cases (13/13) demonstrated balloon crossover >50% of contralateral half. All cases (13/13) showed cement crossover while 76.9% (10/13) showed cement crossover >50% of contralateral half. For stentoplasty, all cases (55/55) showed midline stent-cement complex crossover and 78.2% (43/55) exhibited stent-cement complex crossover >50% of contralateral half. There was no major complication or mortality. Minor complications included: asymptomatic cement extravasation (6.4%, n = 5) and self-limiting hematoma (1.3%, n = 1).

Discussion & Conclusion:
CBCT permits unipedicular access in a range of vertebral body augmentation procedures and represents the natural "next step" in spinal augmentation technique.

OP-CR-76

To Assess the Need for Routine Chest X-Rays after Ultrasound (US)-Guided Thoracentesis

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Background & Hypothesis:
Current practice of ultrasound guided thoracentesis requires a postprocedure chest X-ray for assessment of complications. The aim of this study is to assess the utility of routine post-thoracocentesis chest X-ray.

Methods:
Patients who underwent US-guided thoracentesis from January 2011 to May 2015 were retrospectively recruited; 1558 patients (894 men and 664 women; mean age, 66.8 years; range, 17 to 102 years) underwent 2053 US-guided thoracentesis. Drains used were to the procedurists' preferences (8F n = 9, 9F n = 1, 10F n = 2023, 12F n = 6, 16F n = 2, not recorded n = 12). Procedures involving computed tomography or fluoroscopy were excluded. Duration after the procedure the chest X-ray was taken, outcomes and mortality were recorded.

Results:
A total of 99.4% (2041/2053) of procedures had chest X-ray performed after the thoracentesis: within 1 hour (n = 1820), 92.5% (1684/1820) had normal X-ray findings, 6.1% (111/1820) showed pneumothoraces and 1.4% (25/1820) had incorrect tube placement; between 1-4 hours (n = 167), 94% (157/167) had normal X-ray findings, 5.4% (9/167) showed pneumothoraces and 2.4% (4/167) had incorrect tube placement; between 4-12 hours (n = 38), 12-24 hours (n = 8) and after 24 hours (n = 8), 21% (8/38), 25% (2/8) and 25% (2/8) showed pneumothoraces respectively; 39% (30/38), 75% (6/8) and 75% (6/8) had normal X-ray findings, respectively. Complications included pneumothorax requiring intensive care (n = 1), circulatory collapse (n = 1) and vasovagal episodes (2.2%, n = 45).

Discussion & Conclusion:
The use of ultrasound to guide the placement of the chest drain might contribute to decreasing complications of thoracentesis. The need for a chest X-ray to detect postprocedure complications is not justified.

OP-CR-77

Postmastectomy Radiotherapy in N1 Disease

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Background & Hypothesis:
Postmastectomy radiotherapy (PMRT) has been shown to reduce locoregional recurrence and improve overall survival in those with larger tumour size and N2 disease. However, the role of PMRT in postmenopausal patients with N1 disease is controversial. This study investigates if PMRT reduces locoregional recurrence and improves survival in N1 disease.

Methods:
A single centre, retrospective study, was performed in 222 postmenopausal patients diagnosed with N1 breast cancer from 2004 to 2011. All patients underwent mastectomy and axillary clearance. Outcome was measured via disease-free survival and overall survival.

Results:
Of the 222 patients, 115 (51.8%) had radiotherapy and 107 (48.2%) had no radiotherapy. Median follow-up was 58.1 months. There was a significant difference in tumour grade, lymphovascular invasion status, and estrogen receptor status, in patients who had RT compared to those who did not have RT ($P = 0.01$). At 3 and 5 year follow-up, there was no significant difference in recurrence or survival between the RT versus the no RT group. Subgroup analysis revealed a significant difference in 3 and 5 year overall survival in patients with 3 lymph nodes positive, versus those with 1-2 lymph nodes positive ($P = 0.03$ and $P = 0.005$ respectively).

Discussion & Conclusion:
PMRT in postmenopausal patients with N1 disease did not show a significant improvement in outcome. However, PMRT showed overall survival benefit amongst those with higher lymph node involvement. PMRT did not appear to affect outcome in patients with higher histological grades, lymphovascular invasion, estrogen receptor status, age and presence of systemic therapy. Longer follow-up may be required for a significant difference in terms of outcome to be observed.

OP-CR-78

Sarcopenia in Cognitively Impaired Older Adults: The Role of Inflammation and Endocrine Dysregulation

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Background & Hypothesis:
Sarcopenia contributes to frailty with adverse consequences in dementia. We examined the role of inflammatory and endocrine mediators underlying sarcopenia in cognitively impaired older adults.

Methods:
In this cross-sectional study, patients with mild cognitive impairment and mild-to-moderate Alzheimer's dementia attending a memory clinic completed cognitive, functional, physical performance and nutritional evaluation. Appendicular skeletal mass (ASM) was measured using DXA imaging. Serum biomarkers of inflammation–Interleukins (IL)-6, -1Beta, -15; CD40 ligand (CD40L); interferon gamma-inducible 10 kDa protein (IP-10)–were measured, along with the anabolic hormone insulin-like growth factor-1 (IGF-1). Sarcopenia was defined using European Working Group algorithm, employing Asian cutoffs.

Results:
Forty-seven (48.5%) of 97 recruited patients (mean age 76.6 + 6.7) were sarcopenic, being significantly older (P = 0.024), poorer nutritional status (MNA score: 23.9 + 2.2 vs 25.6 + 2.0, P <0.001) and less hyperlipidaemia (P = 0.050), with trend for lower physical activity level (P = 0.062). Serum IP-10 was higher [165.6 (IQR 58.8-239.9) vs 111.9 pg/ml (IQR 41.9-206.6), P = 0.035] and IGF-1 was lower [76.4 (IQR 49.8-129.3) vs 134.3 ng/ml (IQR 88.4-190.9), P <0.001] with sarcopenia. The state of being neither pro-inflammatory (IP-10 >top quartile) nor endocrine-deficient (IGF-1 <lower quartile) was more likely in non-sarcopenic patients (76% vs 42.6%, P = 0.006). In multiple logistic regression, significant predictors for sarcopenia were nutrition and endocrine-deficient state (OR 4.65, P = 0.034), with pro-inflammatory state exhibiting trend for increased risk (OR = 3.63, P = 0.080).

Discussion & Conclusion:
We have identified potentially modifiable factors for sarcopenia in cognitively impaired older adults, supporting nutritional optimisation. Our findings offer a platform for intervention trials targeting inflammatory and hormonal pathways to prevent sarcopenia.

OP-CR-79

Elucidation of Cognitive Functioning in Deficit versus Non-Deficit Subtypes of Schizophrenia

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Background & Hypothesis:
Deficit syndrome is a subtype of schizophrenia with severe and persistent negative symptoms. As cognitive impairments are core features of schizophrenia, we aim to investigate differences in cognitive functioning and quality of life (QOL) between patients with deficit (DS) and non-deficit (NDS) subtypes of schizophrenia. We hypothesised that patients with deficit subtype will show poorer cognitive functioning and corresponding poorer QOL compared with non-deficit subtypes of schizophrenia.

Methods:
Overall, 199 subjects (68 healthy controls, 27 non-deficit and 104 deficit schizophrenia patients) were assessed on cognitive functioning using the Brief Assessment of Cognition in Schizophrenia (BACS) and QOL using WHOQOL-BREF. Differences in cognitive and QOL scores between groups were analysed using ANCOVA and controlling for age, gender, education, employment status, and marital status.

Results:
Significant differences were found between deficit and non-deficit schizophrenia subtypes on verbal memory total, semantic fluency and BACS total scores, with deficit subtype performing poorer than non-deficit subtype schizophrenia ($P < 0.05$). However, no difference was found in QOL between the 2 patient groups. Healthy controls performed significantly better than both patient subtypes in similar cognitive domains ($P < 0.001$). Of note, no significant correlation was found between total BACS and total QOL scores in the patient group.

Discussion & Conclusion:
Patients with deficit syndrome suffer even more severe cognitive impairments which did not correlate with QOL. This highlights the need to be even more attentive to the cognitive impairments in deficit schizophrenia subtype and examine ways to manage them including cognitive rehabilitation strategies.

OP-CR-80

An Initial Experience Using Fusion CT/MR with Real Time US Guidance in Hepatic Tumour Ablation

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Background & Hypothesis:
Fusion imaging of CT/MRI with ultrasonography (US) has shown to be beneficial in lesions poorly visualised on pure US, and reduces mistargeting rate in hepatic intervention. We examined the technical success of fusion imaging for hepatic RFA intervention in the initial experience of a single centre.

Methods:
Data was retrospectively reviewed for 88 patients with 126 lesions who had underwent hepatic RFA ablation from January 2012 to April 2015 using either fusion imaging or pure US guidance. Technical success was evaluated by identifying an adequate ablation area in immediate postprocedure imaging, with a secondary endpoint at 6-months follow-up for early recurrence.

Results:
Of the 126 lesions, 109 were HCC, 17 were liver metastasis and the mean size was 22.7 mm (SD ± 9.76 mm). Overall, pure US and fusion showed very high technical success rates (97.7% vs 97.4%). However, the fusion group had a higher rate of early recurrence at 6-months (69.2%) vs pure US (91.7%) ($P = 0.002$). The fusion group had a larger proportion of difficult lesions (segment 4a, 7, 8), but the subanalysis of difficult lesions still showed higher rates of early recurrence (pure US: 89.4% vs fusion: 63%, $P = 0.014$).

Discussion & Conclusion:
Our centre's initial experience of using fusion imaging in hepatic RFA intervention showed very high technical success rates, but a higher rate of early recurrence at 6-months. This is postulated to be due to differences in tumour biology for inconspicuous lesions on US, and a technical learning curve. Further studies identifying predictive factors for early recurrence in lesions inconspicuous on US is recommended.

OP-CR-81

One-Year Outcome Comparing Drug Coated Balloon Only Angioplasty versus Drug Eluting Stent in Diabetic Patients with De Novo Small Vessel Coronary Artery Disease in Singapore

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Background & Hypothesis:
Drug eluting stent (DES) implantation in diabetic patients with small vessel coronary artery disease (SVD) has high risk of major adverse clinical events (MACE). Drug coated balloon may offer an alternative therapy in this subset of patients.

Methods:
We retrospectively analysed 172 diabetic patients who underwent PCI to de novo lesion with DCB (92) or DES (80) with device size ≤ 2.5 mm from 2011-13.

Results:
In the DCBA group (male 71.1%, age 60.4 years old HbA1c 8.4%), 91.3% had hyperlipidaemia, 88% had hypertension and 69.2% presented with acute coronary syndrome. The demographics of the DES group were well matched. Patients treated with DCB received shorter duration of dual antiplatelet therapy (DAPT) than the DES group (7.0 ± 177; 4.7 months vs 11.7 ± 1.9 months, $P < 0.0001$). At 1-year, there were 9 MACE in DCBA group versus 12 in the DES group (9.6% vs 15% respectively, $P = 0.76$). There was fewer myocardial infarction (MI) observed in the DCBA group (2.2% vs 10.0%, $P < 0.05$). There were no differences in death (0% vs 3.8%, $P = 0.09$) or target lesion revascularisation rate (7.4% vs 6.3%, $P = 0.77$) between those treated with DCB and DES.

Discussion & Conclusion:
While DES and DCB have similar MACE rate at 1-year follow-up, those treated with DCBA have lower MI rate and received shorter course of DAPT. DCB may be a safe and effective alternative to DES in the treatment of SVD in diabetic patients.

OP-CR-82

The Relationship between Fluconazole Resistant *Candida Tropicalis* and the Presence of Mutations in *ERG11* and *ERG3* Gene

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Background & Hypothesis:
In recent years, *Candida tropicalis* has emerged as an important causative agent of candidemia and candidiasis, particularly amongst the elderly, paediatric and immunosuppressed populations. The treatment of candidiasis and candidemia requires the usage of antifungal drugs. As there are only 3 classes of antifungal drugs available, namely azoles, echinocardins and polyenes, the development of resistance to any one of these drug classes can thwart treatment plans. Widespread usage of antifungals has resulted in an increased prevalence of antifungal resistant *Candida tropicalis* strains. Therefore, in this study, we aim to find a relationship between fluconazole (azole) resistance in *C. tropicalis* and the presence of mutations in the *ERG11* and *ERG3* gene. These genes are involved in ergosterol synthesis, which is a component of the fungal cell membrane targeted by azoles.

Methods:
Candida genomic DNA was purified using the UltraClean® Microbial DNA Isolation Kit and the gene sequences amplified by PCR. The amplicons were sequenced commercially and analysed for mutations. Both azole resistant (n = 7) and azole sensitive (n = 4) isolates were sequenced.

Results:
It has been observed that all highly resistant isolates have double mutations of *Tyr132Phe* and *Ser145Phe* in the *ERG11* gene. In contrast, none of the sensitive isolates carried these mutations. An *Arg376Lys* mutation in *ERG3*, in the absence of mutations in *ERG11*, may account for a lower level of resistance towards azoles.

Discussion & Conclusion:
There is a clear association between the presence resistance mutations (*Tyr132Phe* and *Ser145Phe*) in the *ERG11* gene and azole resistance.

OP-CR-83

Endoscopic Submucosal Dissection (ESD): Clinical Outcomes in a Tertiary Centre in Singapore

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Background & Hypothesis:
Gastrointestinal tract cancers when diagnosed at a very early stage are amenable to endoscopic resection with good long-term results. The important factor lies on accurate diagnosis together with complete resection of the specimen. The aim of this study is to review the short-term outcome of our patients who underwent ESD treatment.

Methods:
Patients' records from all ESD cases performed in our institution were selected from May 2011 to May 2014 with follow-up endoscopy reviewed. A total of 27 ESD cases were performed and out of these cases, 8 patients with no follow-up endoscopy were excluded.

Results:
A total of 19 patients were followed up with endoscopy post-ESD. The site of lesions treated with ESD were the stomach (n = 9) and colon (n = 10) with 79% en bloc resection rate. The median follow-up duration with colonoscopy was 12 months (range 3-34 months) and gastroscopy was 13.5 months (range 5-23 months). Local recurrence in the colon was 20% (1/4 in endoscopic piecemeal mucosal resection and 1/6 in ESD) and stomach was 11% (1/9 in ESD). The 2 recurrences seen in the colon were serrated adenoma and tubular adenoma with low grade dysplasia at 34 months and 12 months respectively. The 1 recurrence seen in the stomach at 3 months had adenocarcinoma but declined surgery and with additional ESD treatment had no recurrence seen endoscopically at 19 months.

Discussion & Conclusion:
Overall local recurrence rate, post-ESD, remains low at our centre.

OP-CR-84

Elucidating the Relationship between Duration of Untreated Psychosis and Cognitive Functioning in Patients with First-Episode Schizophrenia

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Background & Hypothesis:
The neurotoxic hypothesis suggests that psychosis is toxic to the brain, resulting in cognitive defects. Past studies looking at the association between duration of untreated psychosis (DUP) and cognitive functioning had been inconsistent, both in terms of results and methods. We hypothesised that longer DUP in first-episode schizophrenia (FES) patients is associated with poor cognitive functioning and that higher premorbid intelligence buffered against this toxic load.

Methods:
Eighty-one FES patients and 73 controls completed the Brief Assessment of Cognition of Schizophrenia (BACS) battery and an index of General Cognition was calculated. Hierarchical linear regression models were used to study the predictive value of DUP on General Cognition. A median split using the Wide Range Achievement Test-Reading Test scores was performed to study cognitive variances between patients with low (n = 36) versus high IQ group (n = 35).

Results:
After partialling out the effects of potential confounding factors (including age, gender, education years, medication, severity of psychotic psychopathology), DUP was found to predict additional variance of General Cognition (3.31%, R-square change: $F_{(1, 70)} = 4.791$, Ï = 0.032). In addition, DUP explained more variances of General Cognition in the low IQ group (10.30%, R-square change: $F_{(1, 25)} = 4.564$, Ï = 0.043) as compared to the high IQ group (1.46%, R-square change: $F_{(1, 24)} = 0.736$, Ï = 0.399).

Discussion & Conclusion:
The results suggest that early intervention for psychotic patients may potentially reduce cognitive deterioration during untreated psychosis. Given that patients with lower premorbid IQ are more vulnerable to the toxicity of psychosis on cognition, identifying and treating such vulnerable individuals earlier are warranted.

OP-CR-85

Redefining the Role of Sentinel Lymph Node Biopsy

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Background & Hypothesis:
We performed an intraoperative frozen section (FS) analysis of the sentinel lymph node (SLN) and proceed with a full axillary lymph node dissection if the SLN is positive for metastasis. Close to two-thirds of the SLN are negative. We aim to identify factors predicting for a negative SLN, to determine if we can streamline the need for intraoperative FS analysis.

Methods:
Retrospective analysis was performed of 1173 patients who underwent SLN biopsy from 1 January 2006 to 31 December 2013 was conducted.

Results:
The SLN was negative on intraoperative FS analysis in 945 of 1173 patients (80.6%); 30 of these were falsely negative. The SLN was positive on final analysis in 217 of 1173 patients (18.5%). A positive SLN was twice more likely when abnormal nodes were reported on preoperative ultrasound imaging (P <0.05, OR 2.06, 95% CI 1.40-3.02). Abnormal nodes were biopsied preoperatively in 28 cases; being more commonly done from 2013. In all cases, biopsy was negative for malignancy but 7 were later positive on final SLN histology. Patients with invasive carcinoma were more likely to have a positive SLN compared to those with DCIS (P <0.01, OR 0.04, CI 0.01-0.18). Lymphovascular invasion (P <0.01 OR 5.07, CI 3.67-7.01) and estrogen receptor (ER) status (P <0.01, OR 1.63, CI 1.12-2.36) also predicted for a positive SLN.

Discussion & Conclusion:
Abnormal nodes on the preoperative ultrasound increased the likelihood of SLN involvement. Further studies can determine whether intraoperative FS analysis can be limited to invasive cancers with abnormal nodes negative on the preoperative biopsy.

OP-CR-86

Evaluating the Use of the Montreal Cognitive Assessment (MoCA) for Detecting Cognitive Deficits in Schizophrenia

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Background & Hypothesis:
The Montreal Cognitive Assessment (MoCA) is a rapid screening tool designed to detect mild cognitive impairments in many conditions. Recently, MoCA has been used in clinical practice for the assessment of cognitive impairments in schizophrenia. This study seeks to evaluate the clinical utility of MoCA in detecting cognitive impairments in patients with schizophrenia.

Methods:
Twenty-five participants (aged 23-49) diagnosed with schizophrenia were recruited for this study. The Brief Assessment of Cognition in Schizophrenia (BACS) and MoCA were administered during the same visit to assess cognitive impairments. Participants with BACS Z-score (calculated using the Singapore Norm with the age and gender adjusted) that was one standard deviation below the mean was identified as being cognitively impaired.

Results:
The MoCA raw scores instead of Z-Scores were used in the analysis, as the scores were not affected by age and gender. The MoCA was significantly correlated with BACS (r = 0.57, $P = 0.003$). The diagnostic performance by area under the curve for MoCA was 0.78 (95% CI, 0.55 to 1.0, $P = 0.045$). A MoCA cutoff score of <27 generated a sensitivity score of 100% and a specificity of 50%. The cutoff score of <26 recommended in MoCA manual generated a sensitivity of 79% and a specificity of 50%.

Discussion & Conclusion:
MoCA has modest clinical utility for identifying cognitive impairments in schizophrenia. If adopted for clinical use, findings from our study support a score of <27 instead of 26 as the cutoff for initial screening prior to a comprehensive cognitive assessment.

OP-CR-87

Quantification of Muscle and Fat Volumes in Dixon MRI of Thigh with Extreme Learning Machine

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Background & Hypothesis:
Quantification of muscle and fat volume and distribution is critically important for investigating therapeutic and preventive measures against many clinical problems such as obesity and sarcopenia. Dixon Magnetic Resonance Imaging (MRI) technique provides 4 contrasts (in-phase, out-of-phase, water-only, and fat-only), offering 4 times more information than conventional MRI sequences for the accurate assessment of fat and muscle components. However, it remains unclear how to efficiently utilise such large amount of image information. This study proposes to use a state-of-the-art machine learning technique: extreme learning machine (ELM) for the segmentation of 3D-MRI images with 4 contrasts to identify muscle and fat tissue in thigh.

Methods:
3D thigh images with Dixon MRI sequences were acquired for 12 healthy community-dwelling older adults (age 50-99) as part of larger community study. The automatic detection of muscle and fat tissue is formulised as a 3-class classification issue. Each image voxel was assigned with a correct label (fat, muscle, or background/bone class). An ELM is trained as a voxel classifier based on features from all 4 contrasts to segment unclassified subjects subsequently.

Results:
The ELM segmentation showed good results in terms of accuracy, sensitivity and specificity as 95.08%, 98.22%, and 99.41% respectively for fat tissue segmentation and 97.06%, 95.04%, and 99.92% respectively for muscle mass segmentation, compared to the ground truth verified by experienced radiologists.

Discussion & Conclusion:
Our ELM-based segmentation algorithm produces accurate tissue quantification and showed an effective utilisation of large data provided by the 4 contrast images from Dixon MRI.

OP-CR-88

Predictive Factors for Failure of Initial Hemostasis in Non-Variceal Bleeding Upper Gastro-Intestinal Tract and the Relevance of Forrest Classification

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Background & Hypothesis:
Non-variceal UBGIT is a common medical emergency, with greater morbidity and mortality associated with rebleeding and surgical intervention. This study aims to identify factors that increase the incidence of primary rebleeding and the need for surgical intervention in patients with UBGIT. A secondary aim of this study was to assess the relevance of Forrest classification in the prediction of outcomes in patients with UBGIT secondary to peptic ulcers.

Methods:
Data from 190 patients who had non-variceal UBGIT in Khoo Teck Puat Hospital in Singapore from 2009 to 2012 were retrospectively analysed using SPSS.

Results:
The rebleeding rate in our series was 21.1% and the surgical intervention rate for bleeding not controlled by endoscopic means is 7.4%. Patients on aspirin had a significantly lower odds of primary rebleed. Patients on anticoagulation, those with diabetes, chronic renal failure and Forrest IA ulcers exhibited a non-significant trend towards a primary rebleed. Forrest IA ulcers and Dieulafoy lesions had a significantly higher odds for eventual surgical intervention in patients with rebleeding. Forrest IB – 3 ulcers exhibited similar odds ratios for rebleeding and surgical intervention.

Discussion & Conclusion:
Identifying patients at higher risk of rebleeding and intractability to endoscopic hemostasis will allow us to monitor this subset of patients more closely. The paradoxical finding of a decreased odds of rebleeding in patients on aspirin might be due to the endoscopist being more diligent in securing hemostasis in patients already on aspirin. The predictive value of the Forrest classification for rebleeding and surgical intervention in peptic ulcers should be questioned.

OP-CR-89

A Retrospective Review on the Use of 308 nm Excimer Lamp Phototherapy at the National Skin Centre, Singapore

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Background & Hypothesis:
Excimer light phototherapy (308 nm) is a form of targeted phototherapy shown in controlled studies to be effective in the treatment of localised vitiligo and psoriasis. This study aims to assess its role in a predominantly Asian population at the National Skin Centre.

Methods:
We retrospectively reviewed the clinical data of 247 patients who were started on excimer lamp phototherapy at the National Skin Centre over a 5-year period from 2008 to 2012. The data analysed included the diagnoses, epidemiological data, clinical responses and adverse effects.

Results:
Most patients were Chinese (68.4%) followed by Indians (14.2%) and Malays (8.9%). The patients treated had ages ranging from 3 to 74 years, with 55.5% of them being men. The most common skin disorder treated with excimer lamp phototherapy was vitiligo (80.6%) followed by psoriasis (15.4%), endogenous eczema (1.6%) and mycosis fungoides (0.4%). Majority of patients with vitiligo (90.2%) and psoriasis (97.4%) had tried other treatments including topical corticosteroids and NBUVB before starting on excimer phototherapy; 37% of patients with vitiligo achieved at least 50% improvement after a mean number of 18 sessions of excimer lamp phototherapy while 35.3% of patients with psoriasis achieved at least 50% improvement after a mean number of 15.7 sessions. One-third of patients experienced some minor adverse effects during the treatment, most commonly erythema (22.3%) and pruritus (5.7%). No patient had to stop phototherapy because of adverse effects.

Discussion & Conclusion:
Excimer lamp phototherapy is a safe and well tolerated treatment in our local population, with fairly good efficacy in recalcitrant vitiligo and psoriasis.

OP-CR-90

Exploring Stress-Induced Cognitive Impairment in Middle Aged, Centrally Obese Singaporean Adults

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Background & Hypothesis:
Previous research suggests that those with central obesity may have an altered metabolic profile, which may make them vulnerable when exposed to stressors. The aim of the current study was to explore psychological and physiological responses to a psychosocial stressor in a sample of middle aged, centrally obese Singaporeans and test the impact of this on cognitive performance. It was hypothesised that high waist to hip ratio (WHR) individuals would exhibit a greater psychological and physiological response to the stressor than low WHR individuals. Further, high WHR individuals who respond to the stressor would demonstrate poorer cognitive performance.

Methods:
Fifty male and female, middle aged Singaporeans (M = 51 years, SD = 6.31) were recruited. Heart rate, blood pressure, state anxiety, state self-esteem and cognitive performance were assessed pre and poststress exposure in comparison to no-stress control.

Results:
The stressor task was effective in inducing a stress response, with significantly higher heart rate, blood pressure and state anxiety poststress exposure. High WHR showed significantly higher heart rate and blood pressure than low WHR. Further, high WHR individuals who responded to the stressor showed minor impairments in declarative and spatial memory, while high WHR, non-responders showed some improvement in spatial memory.

Discussion & Conclusion:
The findings indicate that centrally obese adults may have poor stress regulation but this does not always result in poor cognitive performance. Further research is needed to understand how stress influences cognition in vulnerable samples.

OP-CR-91

Outcomes of Percutaneous Cholecystostomy and Predictors of Eventual Cholecystectomy

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Background & Hypothesis:
Percutaneous cholecystostomy (PC) is an established treatment for high surgical risk patients with acute cholecystitis. This paper describes our experience of PC with emphasis on factors predictive of mortality and eventual cholecystectomy.

Methods:
A retrospective review of all patients who underwent PC from 2005 to 2015 was performed. Patient demographics, clinical features, American Society of Anaesthesiology (ASA) score, Charlson Comorbidity Index (CCI), Acute Physiology and Chronic Health Evaluation (APACHE II) score, Tokyo guidelines of cholecystitis, interval between cholecystitis diagnosis and PC, and method of PC were studied. Outcome measures include length of hospital stay, PC complications, 30-day readmission rate, in-hospital mortality, 30-day mortality and eventual cholecystectomy.

Results:
A total of 103 patients with median age 80 years (range 43-105) underwent PC; 55% were male and 72% had associated comorbidities. Median interval between diagnosis to PC was 2 days (range 0-15); 80% were performed via direct route and 20% transhepatic; 9.7% of patients had complications from PC. Median length of stay was 19 days (range 3-206); 30-day readmission rate was 6.8%; 41% underwent eventual cholecystectomy. In-hospital mortality and 30-day mortality rates were 13% and 11% respectively. Higher APACHE scores ($P = 0.004$), higher CCI ($P = 0.009$), and longer interval from diagnosis to PC ($P = 0.037$) were associated with in-hospital mortality. Younger age ($P = 0.015$), lower APACHE scores ($P = 0.043$) and lower CCI ($P = 0.002$) were associated with eventual cholecystectomy. Multivariate analysis revealed that patients with higher CCI have 1.2 ($P = 0.07$) and 1.3 ($P = 0.06$) times increased tendency of in-hospital and 30-day mortality respectively.

Discussion & Conclusion:
PC alone is an alternative to primary cholecystectomy for high surgical risk patients, and prompt PC improves survival. Comorbidity severity predicts poor postcholecystectomy outcomes.

OP-CR-92

Early Clinical Outcomes of Surgical Repair for Full-Thickness Rotator Cuff Tears

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Background & Hypothesis:
Efficacy of surgical repair for full-thickness rotator cuff tears has been well established. We conducted this retrospective study to evaluate the early clinical outcomes after rotator cuff surgery in our institution.

Methods:
We reviewed 80 shoulders with full-thickness rotator cuff tears in 77 patients with 1 year follow-up. Single-row repairs (SR) was performed for 21 shoulders and double-row repairs (DR) for 53 shoulders. Mini-open transosseous repairs were performed for 6 shoulders. Medium size tears were found in 38 shoulders, large tears in 27 and massive tears in 15. Constant outcome scores and UCLA outcome scores were utilised to evaluate clinical outcomes.

Results:
Comparing to preoperation, constant scores and UCLA scores showed significant improvement at 6 months and 1 year postoperation in both SR and DR groups. There were no significant differences between the SR and DR groups at preoperation, 6 months and 1 year postoperation. Patients with different tear sizes didn't show significant differences at these 3 points of time either.

Discussion & Conclusion:
The short-term clinical outcomes of rotator cuff repair for full-thickness tear are promising. There were no differences between single-row and double-row repairs in our series of patients.

OP-CR-93

An Evaluation of a Multidisciplinary Medical Weight Management Programme in a Singapore Hospital

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Background & Hypothesis:
Outcomes of a hospital-based weight loss programme have yet to be published in Singapore. Our aim is to evaluate outcomes from our hospital's multidisciplinary weight management programme (WMP).

Methods:
A retrospective observational study was conducted using data records from January 2013 to December 2014. Data were excluded if patients dropped out after 7 weeks or had gone through bariatric surgery for weight loss. The 16-week WMP consisted of consults with the endocrinologist, diet interventions, exercise and behavioural counselling. Weight at weeks 2, 7 and 16, respectively, were compared with the baseline weight. Regression analysis was used to predict weight loss.

Results:
Fifty-three data records were analysed. Mean percent weight loss from baseline at weeks 2 (0.8%; [95% CI 0.6 to 1.0]), 7 (2.3%; [1.8 to 2.9]) and 16 (4.8%; [3.7 to 5.8]) were significant (all P <0.001). Weight loss was significantly and inversely correlated with self-reported self-efficacy in diet plan adoption on a scale of 0-10 (0 = no confidence; 10 = most confident) (r = -0.40, P = 0.003) and dietician-assessed motivation in diet adherence on a 4-point Likert scale (1 = poor; 4 = good) (r = -0.33, P = 0.017). Only these factors predicted weight loss.

Discussion & Conclusion:
Our multidisciplinary WMP resulted in a significant weight loss by the end of the programme. Our findings showed that patients who rated themselves with poorer self-efficacy in diet adoption and scored poorer motivation in diet adherence at baseline were likely to lose more weight. This is in contrast to the popular notion that higher self-efficacy and higher motivation result in more weight loss.

OP-CR-94

1H Spectroscopic Imaging of the Liver with Spiral Encoding in a Single Breath-Hold

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Background & Hypothesis:
Single-voxel spectroscopy has been demonstrated to successfully characterise liver lipid fraction in patients with non-alcoholic fatty liver disease. The major drawback is that only a small area of tissue is sampled, which introduces sampling errors as fatty infiltration into the liver may not be uniform. Respiratory motion degrades spectral quality and patients are instructed to hold their breath, which imposes a time limit on the acquisition time. Here, we demonstrate the application of fast MRSI accelerated with spiral encoding for a 2D coverage of the liver within a single breath-hold.

Methods:
Three healthy subjects were scanned on a 3.0T MRI scanner (Siemens AG, Erlangen, Germany). MRSI data was acquired using a stack of spirals accelerated in the (x, y) plane for a FOV of 20 cm x 20 cm and a 3 cc voxel size, yielding a total measurement time of 20 s.

Results:
The most dominant lipid peak is at 1.3 ppm. As the line widths of the peaks are large, the multiple lipid peaks at 0.9 ppm, 1.3 ppm and 2.2 ppm are treated as 1 entity. Peaks at 4.2 ppm and 5.3 ppm are usually masked by water and excluded from the total fat calculation, because they contribute relatively little to the overall fat.

Discussion & Conclusion:
We have successfully obtained a 2D spatial map of the liver fat fraction with a voxel size of 3 cc, with fast MRSI, within a breath-hold of 20 s. This method enables a quick evaluation of the spatial variation in lipid fraction in the liver.

OP-HPE-01

A 2-year Study on Training and Trainer Effectiveness in Occupational Therapy and Physiotherapy Programmes for Undergraduates Trainees

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Background & Hypothesis:
The goal was to provide a purposeful training with positive trainer attributes to influence undergraduate students (trainees) attached to KKH either for the physiotherapy or occupational therapy training programme to become competent healthcare providers.

Methods:
A cross-sectional survey design was administered to 12 occupational therapy and 20 physiotherapy trainees. The first 5 questions relied on a 4-point Likert scale: strongly disagree – 1; somewhat disagree – 2; somewhat agree – 3; and strongly agree – 4. The last question relied on a 4-point Likert scale: not at all satisfied – 1; slightly satisfied – 2; moderately satisfied – 3; and very satisfied – 4. Convenience sampling procedure was used and data collected evaluated the training effectiveness and trainer attributes of both programmes.

Results:
For 2 years (2013 to 2014), the response return rate was 100% from both training programmes. Interestingly, in 2013, 1) clear communication of educational goals and objectives, 2) trainers' time and 3) commitment explained by the training environment and resources had 64% variance which proved to be useful for physiotherapy trainees [2013: 3 items ($r = 0.82$, $r^2 = 0.64$)]. In 2014, the 1) trainers' time and 2) commitment explained by the trainees achievement of educational goals and objectives had 45% variance which proved to be useful for physiotherapy trainees [2014: 2 items ($r = 0.67$, $r^2 = 0.45$)]. Similarly, occupational therapy trainees gave positive ratings on trainer attributes [2013: (100%), 2014: (100%)].

Discussion & Conclusion:
Overall, both training programmes organised in KKH for 2 years (2013 to 2014) was well received and positively rated by the trainees as a good training and learning experience.

OP-HPE-02

A Survey to Understand Junior Doctors' Perception of Their Level of Knowledge and Area of Weakness in Haematology

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Background & Hypothesis:
Many junior doctors feel that their knowledge in haematology is inadequate. This survey aimed to understand their perception and area of weakness in haematology in order to make recommendations for improvement.

Methods:
A total of 73 junior doctors (33 house officers and 40 medical officers) were asked to fill up a questionnaire which consisted of 21 questions in June 2015. The first section asked if they felt their knowledge in haematology and some common haematological topics was good, adequate or inadequate. The next part asked about the top 3 haematological topics they wanted to be educated on. Subsequent questions tested their knowledge in blood products, transfusion reactions, tumour lysis syndrome (TLS), febrile neutropenia, iron panel interpretation, thrombocytopaenia and coagulation.

Results:
A total of 85% of sample felt that their knowledge in haematology was inadequate. More than 50% of sample felt that their knowledge in blood products, tumour lysis syndrome (TLS), thrombocytopaenia and deranged coagulation was inadequate. Coagulation, transfusion reactions and blood products were the top 3 topics they wanted to be educated on. Fifty-six percent and 67% of sample answered correctly the questions on febrile neutropenia and iron deficiency anaemia, respectively. Less than 40% of sample answered correctly the questions regarding transfusion reaction (15%), fresh frozen plasma (30%), cryoprecipitate (0%), TLS (19%), anaemia of chronic disease (4%), prophylactic platelet transfusion (35%) and coagulation (25%).

Discussion & Conclusion:
Many junior doctors felt that their knowledge in haematology was inadequate. This was consistent with their score. Recommendations to improve their haematology knowledge have been made.

OP-HPE-03

Pilot of Exposure to Nursing and Allied Health through Experiential Learning

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Background & Hypothesis:
Experiential learning is espoused to inculcate critical thinking. This is fundamental in nurse education, translating theoretical knowledge into real-life clinical application. Healthcare exposure programmes for school students currently rely on didactic methods such as lectures, despite its ineffectiveness at facilitating learning. In line with Healthcare 2020's focus in attracting young Singaporeans to nursing and allied health professions, a new engagement strategy is needed. E-NATE (Exposure to Nursing and Allied Health through Experiential Learning) is hypothesised to increase students' awareness of healthcare profession options and increase their interest in pursuing nursing and allied healthcare professions.

Methods:
E-NATE was designed and facilitated by nurses, piloted for 14 students. Students were introduced to the nature of nursing and allied health professions through hands-on activities to relate their knowledge to clinical activities. Reflection was facilitated to explain how each activity benefits patient care, enabling comprehension of their rationale. On completion, participants were surveyed by a 13-item questionnaire and engaged in a focus group discussion. Descriptive statistics were generated with Excel.

Results:
All participants ($P = 0.018$) reported that they learnt more about healthcare profession options with increased interest in considering specific careers in nursing and allied health. Seventy percent of them ($P < 0.00001$) reported changing their career interest towards these professions. A common theme identified was preference for the engagement and experiential learning offered through E-NATE.

Discussion & Conclusion:
E-NATE's experiential learning was repeatedly identified as a key factor in participants' subsequent interest towards considering careers in nursing and allied health. This validates its efficacy in effective outreach to students and further adaptation for use.

OP-HPE-04

Attitudes towards Research amongst Clinicians in a Teaching Hospital

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Background & Hypothesis:
The aim of this anonymous survey was to elicit the anaesthesia clinicians' unreserved responses regarding their feelings towards research in general.

Methods:
Faculty was invited to anonymously participate in a survey.

Results:
Ninety percent of the respondents stated that they had participated in research, with most of them having done so as a postgraduate trainee (44%). Only 21% of the consultants had been involved in research. Ten percent stated they had participated as an undergraduate student. Clinical research was the most predominant form of research carried out by the respondents (80%), followed by 15% for multiple forms of research, 4% for educational research and 1% for laboratory research. Sixty-two percent stated they were interested in doing research, but 73% felt that research should not be mandatory for graduation from training or promotions. There was an even divide (50%) about the general feeling that "research is only for a few people" vs "everybody should contribute to research". However, most respondents (95%) felt that interested people should get "protected time" for research. Seventy-nine of them felt that the medical school curriculum has taught research adequately and 86% felt that research ethics should be taught before graduation. Only half (50%) felt that enough research was being carried out at their institution.

Discussion & Conclusion:
This survey aims at a greater understanding of anaesthesia clinicians towards research. Through this study, we have elicited a response that leads us to believe that greater motivation and training is required in order to inspire more clinicians to contribute towards research and that clinically relevant research is more popular.

OP-HPE-05

Teaching Undergraduates Professionalism in the ICU through an Interprofessional Approach

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Background & Hypothesis:
Our medical graduates, after leaving medical school, are required to master taking care of real patients and dealing with acute care situations, communicating with families and other nuances of patient care in the acute setting in the wards, A&E and ICU, without learning the basic aspects of such care. We hypothesised that teaching professionalism through IPE would be more effective.

Methods:
In a small group setting, the principal investigator (PI) introduced these concepts by means of a didactic lecture, 6 case-based discussions led by allied health and an interactive session with allied health and medical students. This was followed by a focused ICU patient round where the concept of good bedside practice was demonstrated by the PI.

Results:
Our results have shown a very dramatic impact. There were 62 participants over 6 months. Our results as seen in Tables 1 to 5 show a positive response both qualitatively as well as quantitatively.

Discussion & Conclusion:
Whilst undergraduates largely remain out of the ICU in our setting, unless accompanying surgical or medical teams to visit individual patients, when thrown as an intern into this setting, they find themselves mostly overwhelmed. In 1994, a large survey in the US showed that most students felt a lack of confidence in this field and a large number (80%) suggested that critical care medicine should be made part of the curriculum after the third year of medical college.

OP-HSR-01

Healthcare Utilisation and Costs of Diabetes Patient with Chronic Kidney Disease

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Background & Hypothesis:
Singapore has the highest rate of patients with end stage renal disease due to diabetes. This study looked at the healthcare costs and utilisation of diabetes patients with chronic kidney disease stages 3A to 5 in 2014. Knowing the costs would help us in estimating baseline costs for interventions to prevent the progression of chronic kidney disease and knowing the utilisation would help us in planning for healthcare services.

Methods:
This is a cross-sectional study of type 2 diabetes patients in National Healthcare Group Polyclinic with chronic kidney disease in 2014. We looked at the healthcare gross costs and healthcare utilisation (specialist outpatient clinic visits, emergency department visits, and inpatient admissions) in 3 acute hospitals (Tan Tock Seng Hospital, National University Hospital and Jurong Health Services) and 9 primary care clinics (National Healthcare Group Polyclinics).

Results:
The mean cost per diabetes patient increases by CKD stages: CKD stage 3A, $2829.51; CKD stage 3B, $3645.19; CKD stage 4, $5364.64; and CKD stage 5, $15,549.34. The high cost for CKD stage 5 diabetes patients is mainly driven by inpatient admissions as the mean number of inpatient admissions increases by CKD stages: CKD stage 3A, 0.2 admissions; CKD stage 3B, 0.3 admissions; CKD stage 4, 0.4 admissions; and CKD stage 5, 1.3 admissions.

Discussion & Conclusion:
The annual cost per CKD stage 5 diabetes patients is almost 5 times more than the cost per CKD stage 3A diabetes patients. The cost-effectiveness of interventions to retard chronic kidney disease progression can be evaluated using this information.

OP-HSR-02

Youth Smokers' Reactions towards Anti-Smoking Campaigns: An Exploratory Approach

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Background & Hypothesis:
Youth-targeted anti-smoking campaigns have intensified due to a startling rise in youth smoking rates. However, not all campaigns are equally effective. It is crucial to identify effective elements of successful campaigns so that future efforts can be formulated with the "active ingredients".

Methods:
As part of a larger exploratory study, youth smokers' awareness and opinions towards anti-smoking messages were examined through focus group discussions (FGDs). Twelve FGDs were conducted with 91 youth smokers (54 males, 37 females) aged 15-30 years. Thematic inductive analysis was used to code transcripts for content concerning youth's reactions towards anti-smoking campaigns.

Results:
Participants lauded 2 foreign anti-smoking advertisements circulating on social media for: 1) its uncensored portrayal of actual victims suffering from serious smoking-related diseases, and 2) actively "making your unconscious worries conscious". Importantly, participants highlighted that their reactions to these messages were short-lived and were quickly replaced by their physical need for nicotine. Participants criticised prior local campaigns for: 1) relying on scare tactics, 2) dramatising medicalised images, and 3) imbedding messages in sports and/or dance events that distracted attention from the anti-smoking content. There was good awareness of the more recent iQuit campaign with some positive feedback relating to its non-judgmental message, though the majority of participants were not convinced that it would result in outcomes.

Discussion & Conclusion:
Few "active ingredients" that successfully influenced youth smokers' cognitions were identified. However, participants reported that these effects did not translate to sustained behaviour change. Future anti-smoking campaigns should also include tangible support for youth smokers' physiological dependence.

OP-HSR-03

Understanding How Seniors with Early Cognitive Impairment Perceive Advance Care Planning

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Background & Hypothesis:
Advance care planning (ACP) is an essential component of holistic care for patients with early cognitive impairment (pECI) who retain mental capacity to make informed decisions. Despite knowing the risk of future decisional incapacity, extant literature shows that many pECI do not make advance care plans. We explored what pECI perceived to be possible barriers and benefits of ACP.

Methods:
Ninety-eight consecutive pECI (Clinical Dementia Rating = 0.5/1.0) underwent information session in a hospital-based ACP service. They were interviewed on their beliefs and attitudes toward ACP using the perceived barriers and benefits scales. Repeated measures ANOVA examined the pattern of responses within the subcategories of the scale and exploratory factor analysis (EFA) elicited the main factors that underlie the scales.

Results:
Mean scores across the different items in Perceived Barriers Scale were significantly different (F (53, 262) = 19.53, MSE = 0.43, P <0.001, $η^2$part = 0.126). Many pECI had not given thought to ACP (M = 2.95). Conversely, lack of family support was the least perceived barrier to ACP (M = 2.20). EFA revealed 3 factors in the perceived barriers scale: 1) denial of the possibility of future decisional incapacity and avoidance of making plans, 2) belief that one can with daily living with no immediacy to make future plans, and 3) procrastination in making future care plans. EFA showed perceived benefits scale was uni-dimensional.

Discussion & Conclusion:
There are 3 main barriers to ACP in pECI, namely, avoidance, passivity and procrastination. Addressing these barriers in an ACP service is necessary to help pECI better understand and accept the need for making care plans for future.

OP-HSR-04

Knowledge of Cervical Cancer, Human Papilloma Virus (HPV) and Pap Smear Screening Among Young Singaporean and Australian Women

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Background & Hypothesis:
Cervical cancer remains the second most common cancer in females, and the 10th and 16th leading cancer in Singaporean and Australian women, respectively. Knowledge of cervical cancer, human papilloma virus (HPV) and Pap smear is a prerequisite to use cervical cancer preventative measures. We therefore assessed the knowledge of young women in Australia and Singapore—2 modern countries with substantial cultural differences that may affect sexual health knowledge and behaviour.

Methods:
A purpose-designed questionnaire measuring knowledge of cervical cancer, HPV, HPV vaccination and Pap smear (20 items) was distributed to a sample of 18- to 26-year-old Australian (n = 274) and Singaporean women (n = 206).

Results:
Singaporean women reported significantly lower levels of knowledge (M = 8.22, SD = 4.23) than Australian women (M = 12.58, SD = 3.17). Australian women reported higher and more regular participation in Pap smear screening compared to Singaporean women. While a larger proportion of Australian participants (83%) than Singaporeans (17%) were sexually active, sexual activity had no effect on knowledge levels. Amongst women who were sexually active, those with higher knowledge levels more regularly participated in Pap smear screening.

Discussion & Conclusion:
These findings highlight the association of knowledge with uptake of Pap smear screening, which bears importance in cervical cancer screening campaigns in Singapore and Australia. Healthcare practitioners in Singapore and Australia should educate young women who lack sexual health knowledge, on their susceptibility to cervical cancer and on the necessity for cervical cancer vaccination and screening.

OP-HSR-05

Can the Edmonton Frail Scale be Used as a Standalone Rapid Geriatric Screening Tool in the Emergency Department?

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Background & Hypothesis:
Frailty has been shown to predict adverse health conditions. The Edmonton Frail Scale (EFS) is a simple effective frailty screening tool. Administrable in 5 minutes, it assesses 8 domains (cognition, general health status, functional independence, social support, medication use, nutrition, mood continence and functional performance). Patients are classified into "not frail", "mildly frail", "moderately frail" and "severely frail". As majority of the components between EFS and rapid geriatric screening (RGS) overlap, we assessed the feasibility of administering EFS.

Methods:
EFS was administered on emergency department patients who have completed RGS. Domains were analysed to check for correlations with the number of geriatric issues, Abbreviated Mental Test (AMT), Basic (BADL) and Instrumental Activities of Daily Living (IADL) scores, and dispositions.

Results:
A total 229 patients were recruited from May 2014 to November 2014; 63.8% were female and median age was 78. Out of those patients, 31.9% were found to be "not frail", 24.5% "mildly frail", 27.1% "moderately frail" and 16.6% "severely frail". A higher EFS and geriatric unmet needs were found to be significantly associated, as well as lower AMT, BADL and IADL scores (all P <0.001)."Cognition" and "functional" components in EFS independently correlated with RGS's AMT, BADL/IADL scores, respectively (all P <0.001). A significant association was also found between EFS and dispositions: while majority of "not frail" patients were discharged, 43.5% of "moderately frail" were referred to geriatric outpatient clinics and 42.1% of "severely frail" were admitted (P <0.01).

Discussion & Conclusion:
EFS is found to be an ideal tool to identify specific geriatric needs. It correlates well with cognitive, functional statuses, and guides disposition.

OP-HSR-06

Patient's Perspective of Reasons behind Frequent Emergency Department Visits

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Background & Hypothesis:
A small group of patients makes frequent visits to the emergency department (ED), accounting for a significant percentage of the total visits in the department. They place significant burden on the limited resources at EDs which might be overcrowded. Little is known from the frequent attenders' perspective of the underlying reasons behind their frequent visits. The study aims to understand, from the patients' point of view, the reasons behind their frequent ED visits.

Methods:
A qualitative study using a grounded theory approach was conducted at a tertiary hospital in Singapore between June 2014 to March 2015. Patients were selected using a purposive sampling technique. Patients selected were 21 years old and above, and had 4 or more visits in the preceding 12 months. Immediately after written consent was obtained from the patient, a face-to-face in-depth interview commenced. The study was continued till data saturation was reached.

Results:
A total of 40 patients (67.5% male, mean age 58.25) were recruited and interviewed. Six main themes emerged: free/subsidised consultation, convenience (e.g. 24-hours and nearby), recurrent medical need (e.g. multiple comorbidities, poor disease control), hospital service is better (e.g. one-stop specialist centre), on third party's medical advice (e.g. advised by primary doctor) and health system issues (e.g. delay in preoperative workup resulting in a need to extend medical leave).

Discussion & Conclusion:
This study provides a better understanding of the psychosocial and medical needs of ED frequent attenders. This allows healthcare professionals to target interventions that are effective in improving patient's health and reducing ED attendances.

OP-HSR-07

Body Mass Index, Waist-Hip Ratio and Risk of Chronic Medical Condition in the Elderly Population in Singapore

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Background & Hypothesis:
Ageing is increasing worldwide. Anthropometric measurements are important components of nutritional assessment in the elderly. The study aimed to establish the prevalence and relationship of body mass index (BMI) and waist-hip ratio (WHR) with chronic medical conditions and their associated sociodemographic correlates in elderly.

Methods:
Data was extracted from the Well-being of the Singapore Elderly (WiSE) study, a cross-sectional, epidemiological study conducted among Singapore residents (n = 2565) aged 60 years and above recruited through disproportionate stratified sampling method. Variables assessed included height, weight, waist and hip circumference. Sociodemographics and chronic medical conditions were collected from participants.

Results:
The study found that 8.7% of the population were obese, 33.4% were overweight, 52.5% were normal and 5.5% were underweight. Malays and Indians were more likely to be obese and overweight. Homemakers were more likely to be obese. Participants with no prior or lower education were more likely to be underweight as were those aged 85 years and above. Prevalence of high WHR was 79.8% and more pervasive among Indians. Homemakers were likely to have high WHR while those with tertiary education tended to have low WHR. Being obese and overweight was associated with hypertension, and high WHR was independently associated with diabetes. Significant associations were not observed for other chronic conditions.

Discussion & Conclusion:
This study demonstrates the association of BMI, WHR with chronic medical conditions (hypertension and diabetes), thus highlighting the importance of anthropometric measurements in risk assessment and clinical management of these conditions in the elderly. More research is needed to understand the environmental and biological factors responsible for ethnic differences in BMI and WHR among elderly.

OP-HSR-08

Frailty amongst Older Adults Predicts Increased Utilisation of Healthcare Services

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Background & Hypothesis:
Frail older adults are at increased risks of falls, fractures and mortality leading to increasing demand on healthcare services. However, the relationship between frailty and utilisation of healthcare services has not been extensively explored. We therefore seek to evaluate the association between frailty and utilisation of healthcare services.

Methods:
A cross-sectional study of 57 older adults using a standardised questionnaire was performed. All patients were assessed for frailty using the Edmonton Frail Scale. SF-12 survey was administered to evaluate multiple domains of quality of life. Comorbidities burden were assessed using the Charlson Comorbidities Index. Data on demographics, presence of caregiver, number of follow-ups, medications and 1-year hospital readmissions were collected.

Results:
A total of 28% (n = 16) of patients were frail with more likelihood of having a caregiver ($P = 0.001$) and a higher Charlson Comorbidities Index (non-frail vs frail, 4.95 ± 2.52 vs 6.44 ± 2.58, $P = 0.023$). They have a higher median number of follow-ups (non-frail vs frail, 2 vs 3), although results were not significant (0.091). They scored lower than the non-frail counterparts in general health ($P < 0.001$), physical functioning ($P < 0.001$), physical role ($P = 0.01$) and social functioning domains ($P = 0.004$). Frail patients are at higher risk of having more than 2 hospital readmissions yearly (non-frail vs frail, 4.9% vs 46.7%, $P = 0.001$), and a higher risk of polypharmacy (non-frail vs frail, 48.8% vs 93.8%, $P = 0.002$).

Discussion & Conclusion:
Frailty is strongly associated with hospital readmissions, an increased comorbidity burden, polypharmacy and poorer quality of life. Recognition of frailty and setting appropriate goals of care is very important to tackle the above issues and improve patient care.

OP-HSR-09

Prevalence of Disordered Eating Behaviours and Body Image Dissatisfaction in Outpatients in a Tertiary Care Psychiatric Hospital

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Background & Hypothesis:
Disordered eating behaviours include unhealthy eating patterns ranging from chronic restrictive eating to binge eating resulting in discomfort, deteriorating self-esteem and personal or body dissatisfaction. Previous literature suggests that emotional and mental well-being is further hampered when disordered eating behaviours are comorbid with psychiatric illness; however, data are sparse on Asian populations. This study aims to establish the prevalence of disordered eating patterns and body image dissatisfaction in outpatients at the Institute of Mental Health (IMH) in Singapore.

Methods:
Data was collected through self-report questionnaires from 50 outpatients, aged 15-40 years who were diagnosed with either schizophrenia spectrum disorder (n = 21) or depressive disorders (n = 29) at IMH. Prevalence of at-risk eating patterns and levels of body dissatisfaction were measured using the Eating Attitudes Test (EAT-26) and the Body Shape Questionnaire (BSQ-8c).

Results:
Based on a cutoff score of 20 and above, EAT-26 scores indicated that 9% of our sample endorsed at-risk eating patterns and behaviours. Additionally, using a cutoff score of 33 and above, BSQ-8c scores suggest that 19% of participants indicated marked concern with body image.

Discussion & Conclusion:
Our results are similar to that of Western clinical populations as IMH outpatients also endorse body shape dissatisfaction which in turn could underlie disordered eating patterns. Comorbidity between mental illness and disordered eating behaviours must be addressed by mental healthcare providers in order to prevent its hindrance to the patient's treatment and recovery.

OP-HSR-10

"People who Smoke Together Stick Together" – A Qualitative Study Exploring Smoking Initiation among Youths in Singapore

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Background & Hypothesis:
Cigarette smoking is commonly initiated during adolescence, and the prevalence of smoking is almost universally highest among youths. As smoking becomes established, cessation is difficult, with research showing that the probability of subsequent quitting is inversely proportional to the age of initiation. This qualitative study explores smoking uptake and initiation among a group of youth smokers in Singapore.

Methods:
Twelve focus group discussions were conducted, involving a total of 91 youth smokers (54 males and 37 females) aged 15 to 29 years. Thematic analysis was used to code transcripts for concepts, patterns and themes related to their smoking behaviours, including initiation. All data analysis was conducted using NVivo (v10).

Results:
Youth smokers identified a number of personal, social and familial influences relating to smoking initiation. The desire to "fit in" and in some cases, peer pressure often led to smoking initiation among youth. Social aspects of smoking including forming friendships, networking and "bonding" were also frequently reported and regarded as positive aspects of smoking. Familial influences including exposure to smoking, and facilitating access to tobacco also led to smoking initiation amongst youths. Other factors for initiation included curiosity and "rebelling" against parents or schools.

Discussion & Conclusion:
This study has highlighted important personal, social and familial influences on smoking initiation among youths in Singapore. In order to reduce and prevent smoking uptake among this population, it is important to address these influences via tailored, youth-centred preventative programmes.

OP-HSR-11

Challenges in Continuity of Care: The Experience of Frequent Users of Emergency Departments in a Large Metropolitan Center in Canada

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Background & Hypothesis:
Programmes designed to increase continuity of care may have several benefits, yet few qualitative studies have explored service user experiences with continuity of care constructs and operationalisation in practice. This study examines service user and provider perspectives of challenges and facilitators to continuity of care for frequent emergency department users with mental health or addiction challenges, a population of interest in many metropolitan centres.

Methods:
Twenty qualitative interviews were conducted to probe the experiences of frequent emergency department users enrolled in a brief case management intervention. Five service providers were also interviewed. Thematic analysis was used to determine common barriers and facilitators to continuity of care.

Results:
Service users and providers identified similar interpersonal barriers and facilitators, and service providers identified additional institutional barriers and facilitators. Interpersonal barriers included difficulties with initial engagements and past histories with ineffective services. Institutional barriers include short duration of programmes, diffusion of responsibility and lack of information about new referrals. Facilitators to continuity included having "champions" at partner institutions, collaboration between service users and providers, providing information, and facilitating empowerment.

Discussion & Conclusion:
Programmes designed to facilitate continuity of care will encounter challenges related to engagement and overcoming past negative experiences. To improve services, it is important to ensure collaboration between agencies and service providers. The process of providing continuity of care empowers service users with information and confidence.

OP-HSR-12

Primitive Reflexes and Dementia in Singapore Elderly

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Background & Hypothesis:
Primitive reflexes (PR) are present in infancy but generally disappear with normal aging. Re-appearance in the aged has been associated with the disinhibition of cortical networks, particularly the frontal lobe. Reflex testing has been identified as the most objective part of neurologic screening as well as being relatively easy and fast to administer. With dementia prevalence on the rise in Singapore, incorporating PR for diagnostic or screening purpose may be advantageous.

Methods:
A total of 2565 elderly participants were neurologically and cognitively assessed as part of the Well-being of the Singapore Elderly study, an epidemiological survey of the local residential population aged ≥60 years.

Results:
Prevalence of the 3 developmental reflexes assessed—glabellar, snout and palmomental—were 12.5%, 0.5% and 0.5%, respectively. A single "glabellar tap" test was found to predict dementia diagnosed using both DSM-IV (OR: 2.5) and 10/66 (OR: 2.1) criteria, while "snout" to predict DSM-IV (OR: 9.8) dementia after controlling for sociodemographics and cerebrovascular dysfunctions (hypertension, heart problems, stroke, diabetes and transient ischemic attack). All 3 reflexes were found to be significant markers of dementia severity. The presence of a second PR (after glabellar) increased the odds for predicting dementia severity from 1.7 to 13.8.

Discussion & Conclusion:
Primitive reflexes, particularly the glabellar tap, were significantly associated with dementia, hence supporting the use of PR as a possible indicator for dementia. While the presence of PRs alone cannot signify dementia, PR testing may be used to gauge the need for a more elaborate examination for dementia among elderly suspected with cognitive decline.

OP-HSR-13

A Brief Clinical Decision Rule for Detecting Panic-related Anxiety in Emergency Medicine Patients

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Background & Hypothesis:
Symptoms of panic attacks and panic disorder can mimic those of medical conditions, prompting patients with panic-related anxiety to seek care in the emergency department (ED). Panic-related anxiety is rarely diagnosed by ED physicians, resulting in costly and unnecessary investigations and poor patient outcomes. The present study investigated a brief clinical decision rule for detecting panic-related anxiety in ED patients.

Methods:
English-speaking adults presenting to the Singapore General Hospital ED, in triage categories 2 (major emergency/severe symptoms) or 3 (minor emergency/mild to moderate symptoms), with a chief complaint of palpitations, chest pain, dizziness, or difficulty breathing were evaluated for the presence of panic-related anxiety with the Structured Clinical Interview for DSM-IV (SCID; First et al, 1995). Our main outcome measure was presence/absence of panic attack or panic disorder based on the SCID criteria. All 13 panic attack symptoms were entered into the initial model. We compared receiver operating characteristics, sensitivity, specificity, and positive/negative likelihood ratios for 2 alternative clinical decision rules created using stepwise model selection.

Results:
In this 200 patient sample, 46.5% met SCID criteria for panic-related anxiety. A clinical decision rule including 5 panic symptoms at a cutoff score of 2 correctly classified 83.33% of patients with and without panic-related anxiety (AUC = 0.85, sensitivity = 92.39%, specificity = 68.97%, LR+ = 2.9771, LR- = 0.1103).

Discussion & Conclusion:
Panic-related anxiety is common and should be strongly considered in ED patients. A brief clinical decision rule can be used to identify such patients with a high degree of accuracy, potentially reducing the cost of care and increasing the appropriateness and efficacy of interventions.

OP-HSR-14

Long-Term Cost-Effectiveness of Direct-Acting Antivirals for Treatment-Naive Patients with Chronic Hepatitis C

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Background & Hypothesis:
Rapid advances in development of direct-acting antivirals (DAAs) have shifted the challenge of treating chronic hepatitis C virus (HCV) from a medical challenge to a socioeconomic issue of affordability. A 12-week all-oral DAA costs approximately SGD 100,000. To date, no study has been conducted to determine the cost-effectiveness of various DAAs within an Asian context.

Methods:
We performed a Markov model to simulate a cohort of 50-year-old HCV infected patients through 14 treatment strategies over life-time period. Treatment effects including sustained virological response and adverse events including anaemia, neutropenia and thrombocytopenia were derived from published trials. Costs were obtained from a tertiary hospital in Singapore. Subset analysis was conducted to incorporate the implication of retreatment that reflected real life situation.

Results:
Using response-guided boceprevir (BOC/RGT, the least costly treatment) as a base-case, peginterferon/ribavirin, 48-week boceprevir and genotype-guided therapies were dominated by BOC/RGT as they were more costly and less effective. Roadmap therapy using rapid virologic-response to guide use of boceprevir and sofosbuvir was associated with favourable incremental cost-effective ratio (SGD 21,507 per QALY gained). Using the Singapore gross domestic product of SGD 70,000 as the threshold, Viekira Pak (ombitasvir/paritaprevir/ritonavir/dasabuvir) and sofosbuvir/ledipasvir were cost-effective and marginally cost-effective, respectively. Other all-oral DAAs were either dominated by Viekira Pak or sofosbuvir/ledipasvir. Roadmap therapy remained as a cost-effective treatment option by incorporating retreatment.

Discussion & Conclusion:
HCV management can be optimised by adopting roadmap therapy that offers best value for money.

OP-HSR-15

Evaluating Data Visualisation for Quality of Care Surveillance: A Case Study on Inpatient Glycaemic Management

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Background & Hypothesis:
Data visualisation can potentially transform voluminous electronic records into useful information for healthcare workers. Using inpatient diabetes care as a case study, we examined the utility of various visualisations to represent adherence to inpatient blood glucose (BG) monitoring timings among healthcare workers.

Methods:
Visualisations with statistical plots, specifically, histogram, violin plot, probability density function (PDF) plot and cumulative distribution function (CDF) plot were assessed. We evaluated the visualisations with heuristics where experts were asked to roleplay typical users, and a questionnaire survey where 69 doctors and nurses indicated their preferences for the visualisations. We adjusted for age and gender with multiple linear regression models.

Results:
Using heuristics, histogram was the preferred visualisation because it was more likely to be comprehensible to the target users. From the survey, violin and cdf plots did not convey information on adherence to BG monitoring as well as the histogram (0.45; 95% CI, 0.15, 0.76) and (0.56; 95% CI, 0.25, 0.86), where a higher score indicates lower preference. When compared to doctors, nurses tend to have difficulty (0.5; 95% CI, 0.15, 0.85) in understanding the visualisations, but they tend to find the visualisations helpful in improving inpatient care (-0.56; 95% CI, -0.9, -0.21) and were more likely to use the visualisations (-0.4; 95% CI, -0.75, -0.05).

Discussion & Conclusion:
Histogram was preferred among doctors and nurses. The role in the delivery of inpatient care influences the preference of visualisations. Developing training programmes that makes visualisations comprehensible and accessible can potentially increase the usage of visualisations in the healthcare setting.

OP-NR-01

Patients' Perceptions of Barriers to Participation in Activities of Daily Living during Hospitalisation

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Background & Hypothesis:
Half of elderly patients lose their ability to perform activities of daily living (ADL) during their hospitalisation, increasing their risk of morbidity and mortality. Unfortunately, the promotion of ADL independence is often overlooked as a care priority for the elderly patients during their hospitalisation. We aimed to explore elderly patients' perception of barriers to their ADL participation during their hospitalisation.

Methods:
This was an exploratory qualitative study. We conducted face-to-face individual semi-structured interviews with an interview guide. We recruited a convenient sample of 15 hospitalised elderly patients who were able to perform at least partial ADL. We ceased recruitment when data saturation was reached. The interviews were conducted in private rooms at the hospital or at bedsides with curtains drawn. The interviews were audio-recorded and transcribed verbatim. We repeatedly review the transcripts to code them. We used Excel to organise the data and thematic analysis to analyse them.

Results:
Themes that emerged included patients' factors such as their passive attitude, physical limitations, powerlessness, being the "good patient", and fear of falling. Nurses factors identified as barriers were nurses' attitudes, appearing busy and imposing restrictions. Other barriers included user-unfriendly ADL items, ward layout and hospital practices.

Discussion & Conclusion:
The insights from the patients' own perspective revealed many barriers to their ADL participation. However many of them could be overcome. The findings could be used to develop strategies to facilitate care that would better promote active ADL engagement. The implementation of these findings is crucial given the growing population of hospitalised elderly in Singapore.

OP-NR-02

Being a Caregiver of Patients with End-Stage Renal Disease in Singapore: An Exploratory Qualitative Study

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Background & Hypothesis:
The diagnosis of end-stage renal disease (ESRD) and requiring dialysis is an event that can shock a family. The overall experience of caregiving, psychosocial needs and seeking support remains virtually untouched in literature. The aim of the study was to understand the caregiving experience of caregivers who were caring for adult patients with ESRD in Singapore. Understanding them can shed light on the resources current use, and exposed areas in need of further development.

Methods:
An exploratory qualitative approach was adopted for this study. Purposive sampling was used to recruit 16 caregivers for patients with ESRD in a tertiary hospital in Singapore. Data was collected using a semi-structured face-to-face interview and analysed using thematic analysis.

Results:
Four themes were generated: intrusion of illness, immersion in illness, embracing positive conceptualisations and experience with support. Among which, it was highlighted that there was an acute phase in ESRD that caregivers needed to manage, and that forced caregivers to accept intrusion and immerse in the illness. Despite caregiving being a difficult experience, caregivers were able to embrace positive conceptualisations with the appropriate social support.

Discussion & Conclusion:
Caregivers of patients with ESRD faced multiple psychosocial problems and thus, there is a need for interventions. Based on findings of this study, nurses could implement self-care education that focus on bringing out the strengths of the caregiving experience. Intermittent home care services could also be developed to better prepare, train and support caregivers in future.

OP-NR-03

Methods of Delivering Psychoeducation Intervention for Caregivers of a Person with Advanced Cancer

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Background & Hypothesis:
Psychosocial interventions have been found to benefit caregivers. Intervention delivery methods have differed across studies, and no study has evaluated the components of the intervention. In our psychoeducation intervention entitled Caring for the Caregiver Programme (CCP) for caregivers of a person with advanced cancer, 4 components were included: 1) video; 2) development of care plan; 3) telephone follow-ups; and 4) online forums. These 4 components were evaluated in this study.

Methods:
Twelve participants were interviewed in a semi-structured face-to-face interview.

Results:
Caregivers favoured the video components in the CCP. This was due to their identification with scenes in the video, visual and audio effects of video which helped in learning, and the ability to share the video with other family members. Majority of the caregivers did not use the care plan as they were too busy to look through it, or felt that they already knew the strategies taught. For those who used the care plan, it served as a guide for self-reflection and discussion. Caregivers appreciated the emotional and informational support from the telephone follow-up. The online forum was not well received. The main barriers cited were that caregivers were busy and did not have time to visit the online forum, they had difficulties accessing the webpage as they were not computer savvy or were seldom on the Internet, and they did not feel comfortable sharing with strangers on an online platform.

Discussion & Conclusion:
The video is a useful tool for intervention delivery, and telephone follow-ups can be used to provide informational and psychosocial support for caregivers.

OP-NR-04

A Qualitative Process Evaluation of a Psychoeducation Intervention for Caregivers of a Person with Advanced Cancer at Home

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Background & Hypothesis:
Caregiving of a person with advanced cancer could be a burden to family caregivers. Although psychoeducation interventions have been provided for caregivers, few qualitative studies have been conducted to understand the impact of the psychoeducation interventions. This study aims to understand caregivers' perception of the Caring for the Caregiver Programme (CCP) and the perceived limitations.

Methods:
The CCP aimed to help caregivers cope with stress and negative emotions, increase closeness between patient and caregiver, increase social support, and to enhance knowledge. Bandura's self-efficacy theory was used as the framework for the intervention, and the 4 strategies to increase self-efficacy were used—personal mastery, vicarious experiences, verbal persuasion and physiologic feedback. The CCP consisted of a face-to-face session, video, individualised care plan, 2 telephone follow-ups and online forum. Participants were recruited from 4 home hospices and the National Cancer Centre outpatient clinic in Singapore. Semi-structured face-to-face interviews were conducted with 12 family caregivers.

Results:
All participants expressed having benefitted from the CCP. Five themes emerged from data analysis: 1) increase knowledge in caregiving; 2) reduce stress and negative emotions; 3) increase social support; 4) improve relationships; and 5) improvement for future caregiver interventions.

Discussion & Conclusion:
This is the first qualitative process evaluation of a psychoeducation intervention in the Asian region for caregivers of a person with advanced cancer. The reduction in stress and burnout, frustration, increase in social support and better understanding of the caregiving experience could be attributed to the video, care plan and telephone follow-up in the CCP.

OP-NR-05

The Impact of Viral Warts on the Quality of Life of Patients

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Background & Hypothesis:
Viral wart is a common skin infection caused by the human papillomavirus (HPV), occurring typically on the hands and feet. At the National Skin Centre (NSC), Singapore, viral wart is the fourth commonest skin disorders for which a consultation is sought, with approximately 1200 patients treated annually with liquid nitrogen cryotherapy. The study aims to understand the impact of viral warts on the quality of life (QoL) of patients receiving liquid nitrogen treatment at NSC.

Methods:
A cross-section survey was conducted on patients between November 2014 to January 2015. Patients' demographic and clinical data were obtained. QoL was measured using the Dermatology Life-Quality Index for Viral Warts (DLQI-VR).

Results:
A total of 99 patients were surveyed over 2 months. Patients had a mean of 3.57 ± 3.89 (range, 1-28) viral wart lesions. The mean DLQI-VR was 15.36 ± 10.61 (range, 0-43), out of a maximum of 60. Patients were most frustrated with the persistence of warts (2.11 ± 1.46), followed by the recurrence of warts (1.87 ± 1.56), and time spent on treatment (1.44 ± 1.37).

Discussion & Conclusion:
As patients were most frustrated with the persistence of viral warts and time spent on treatment, clinicians could suggest alternate treatments such as electrocautery and carbon dioxide laser ablation for patients who have been seeking treatment for a long time. Patients with facial warts had better QoL.

OP-NR-06

A Qualitative Study on the Needs and Experiences of Patients with Alopecia Areata Undergoing Diphenylcyclopropenone (DCP) or Intralesional Triamcinolone Treatment on the Scalp for Hair Growth

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Background & Hypothesis:
Alopecia areata (AA) is an autoimmune disorder which attacks the hair follicles resulting in non-scarring hair loss. At the National Skin Centre (NSC), Singapore, AA is the sixth commonest disorder for which a consultation is sought, with 1119 new patients in 2014. The aim of this study was to understand the needs and experiences of patients with alopecia areata, undergoing intralesional kenalog (triamcinolone) (ILK) injection or topical application of diphenylcyclopropenone (DCP) on the scalp.

Methods:
Qualitative semi-structured individual face-to-face interviews were conducted.

Results:
Interviews were conducted with 10 patients (5 ILK, 5 DCP). The themes were categorised into: 1) initial stage; 2) current stage; and 3) managing post recovery. At the initial discovery of AA, the patients were shocked and sought to find out more about the causes and treatments for AA, and some tried out alternative treatments. AA also had psychological impacts on them. At the current stage, patients hoped for recovery, and discussed on the attitudes which they found were supportive and unsupportive from family member. Managing postrecovery was also a concern for patients as they had to deal with possible recurrences, but were relieved to know that there was a treatment which could help them.

Discussion & Conclusion:
The results gave us an insight to the knowledge needs of patients with AA. Patients also verbalised actions which they perceived as supportive, which would enable us to better support this group of patients.

OP-NR-07

Effectiveness of an Animation Case-based Learning Approach to Improve Frontline Nurses' Knowledge and Attitude on Vital Sign Monitoring towards Detecting Clinical Deterioration: A Multi-Site, Pilot Randomised Controlled Trial

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Background & Hypothesis:
Vital signs form an important set of objective information that can establish a patient's physiological stability. Despite its importance, the nurses' ability to detect clinical deterioration remains suboptimal. Hence, this study aims to evaluate the effectiveness of an innovative education intervention in increasing the knowledge and attitude of enrolled nurses on vital sign monitoring towards detecting clinical deterioration.

Methods:
Conducted in 2 large, tertiary hospitals in Singapore, a randomised controlled trial with a pre and post-test design was conducted. A total of 50 enrolled nurses were recruited and randomised to receive either an animation case-based learning (n = 26) or a conventional Powerpoint learning (n = 24). Knowledge and attitude tests were administered before and immediately after the intervention, with further examination of knowledge retention and learning transfer 2.5 months later.

Results:
The experimental group showed significant improvement in both knowledge (P <0.001) and attitude (P <0.001) scores at the post-test. Between-group comparison showed that the experimental group had significant improvements in both knowledge (P <0.001) and attitude (P <0.001) scores. The experimental group displayed higher motivation (P = 0.001) then the control group. Significant differences on knowledge (P = 0.001) and learning transfer (P <0.05) were also found 2.5 months later.

Discussion & Conclusion:
The positive outcomes demonstrated are attributed to the effective medium of learning vital sign changes using innovative animation and case-based approach. While the animation improved their motivation to learn, the case-based approach seeks to correct misconceptions about physiological changes in vital signs. The occurrence of undetected clinical deterioration can potentially be avoided and patient safety within the general wards can be enhanced.

OP-NR-08

Continued Implementation of an Advanced Practice Nurse-Led Multidisciplinary Programme to Reduce Disruptive Incidences in Young Patients with Mental Health Conditions

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Background & Hypothesis:
Violence in psychiatric settings is rising. Sadly, seclusion and restraint are often its containment measures, although therapeutic environment can reduce unsafe behaviour caused by boredom. The most common reason for mental health referral in youths is disruptive behaviour; boys more than girls. In the child and adolescent unit of a tertiary psychiatric hospital, more than 50 episodes of disruptive incidences have occurred within a calendar year. Each disruptive episode lengthens patient's hospitalisation and additional medical attention is warranted for injuries sustained. A multidisciplinary programme that aims to reduce disruptive incidences by 50% within 6 months was designed and implemented.

Methods:
In the child and adolescent unit of a tertiary psychiatric hospital, a multidisciplinary programme was implemented for 2 years. All inpatients with mental health conditions aged below 19 participated. The interventions included activities tailored to patients' interest and staff's strength, individualised behaviour modification plan with attractive incentives, staff training by multidisciplinary members and other experts, field trips, conferences, training for step-down care staff and transition of patients to facilitate smoother discharge.

Results:
Disruptive incidences decreased by 80% within 6 months, without increasing restraint episodes, surpassing the target of 50%. The programme sustained for 2 years and continued maintaining its 50% target, with introduction of innovative interventions; "The Iceberg", "The Green Place", "Wall Murals with Inspiring Quotes", "Colourful Friendly-looking Scrubs-suits for Nurses", "Multidisciplinary Community Meeting", "Multidisciplinary Poster", among other strategies.

Discussion & Conclusion:
For each disruptive incidence prevented, the organisation saved S$372.83. Intangible benefits included safety promotion, increased satisfaction, motivation, cohesion and reputation, and wiser resource distribution.

OP-NR-09

Nurses' Attitudes towards Research and Evidence-based Practice

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Background & Hypothesis:
Despite the positive influence of research utilisation on patient outcomes, the literature suggests that nurses infrequently engage in evidence-based practices (EBP). This study aims to understand nurses' reservation about research utilisation, by examining their barriers, perception and knowledge in EBP and the factors influencing these.

Methods:
A descriptive survey was conducted on 68 nurses with at least 1 year of working experience. Their perception of EBP was measured by the barriers to research utilisation scale (BARRIERS) with scores ranging from 1 to 4, and the evidence-based practice questionnaire (EBPQ) with scores ranging from 1 to 7. Objective measurement of EBP knowledge was attained via the knowledge assessment test (KAT) with scores ranging from 1 to 35. Higher scores reflected greater barriers, EBP perception and knowledge.

Results:
Nurses reported minimal barriers to research utilisation (BARRIERS M = 2.70, SD = 0.40) and perceived EBP moderately with mean scores ranging from 4.14 to 4.93 on the various subscales. However, they scored relative low on KAT, (M = 14.06, SD = 3.86) suggesting lack in EBP knowledge. KAT scores were affected by prior EBP involvement, $t(58) = 2.41$, $P = 0.02$; and education level. ANOVA and posthoc comparison showed that nurses with degree (KAT M = 15.15, SD = 3.88) had better EBP knowledge than nurses with diploma (KAT M = 12.00, SD = 2.81), $F(3,58) = 3.28$, $P = 0.03$.

Discussion & Conclusion
In this study, data on nurses' favourable perception of EBP was triangulated objectively with lowered knowledge scores. A learning platform can be developed to hone nurses' EBP knowledge.

OP-NR-10

Examining the Impact of Nurse Staffing on Patient, Nurse and Clinical Outcomes

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Background & Hypothesis:
Amidst an era of nursing shortage and adverse events occurrences, the impact of nurse staffing on care outcomes were examined in the literature with unequivocal results. This study aims to explore the impact of nurse staffing on patient and nurse satisfaction, assault rates, fall rates, compliments and complaints in the local acute psychiatric setting.

Methods:
A post-test quasi-experimental study was conducted on 221 patients and 59 nurses. The interventions of low, moderate and high nurse staffing were employed for 3 months. Patients' and nurses satisfaction was measured using the Newcastle Satisfaction with Nursing Scale and Revised Nursing Work Index respectively while clinical outcomes such as assault and fall rates were monitored after partial blinding of outcome assessors, nurses and patients.

Results:
ANOVA and posthoc comparison revealed that patients in the high staffing group had the greatest satisfaction with nursing care, (M = 84.48, SD = 8.45) while satisfaction in the low staffing group was lowest (M = 61.80, SD = 18.19) after controlling for sociodemographic characteristics, $F_{(2200)}$ = 60.79, P <0.001. Similarly, staff in the high nurse staffing group was more satisfied than the low staffing group, $F_{(35, 23)}$ = 2.40, P = 0.02. The best clinical outcomes in terms of assault, fall rates and incidences of compliments and complaints were also demonstrated in the high nurse staffing group.

Discussion & Conclusion:
This study demonstrated that high nurse staffing was associated with better outcomes from patients, nurses and clinical perspectives. This could aid the identification of staffing level to optimise costs and staff retention while minimising adverse events.

OP-NR-11

Development and Validation of a Simplified Fall Assessment Chart for Acute Care Setting

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Background & Hypothesis:
Patients should be assessed for risk of falling within 24 hours of admission if falls are to be reduced. An easy to use assessment tool which do not require specialist assessment skills will enhance its implementation. The aim of this study is to develop and validate a simplified falls assessment tool for adult inpatients in an acute care setting.

Methods:
This study contained 2 phases. Phase I was a retrospective case control conducted in 2011. Fall cases were randomly selected from the inpatient records of 2009 and 2010. A 1:1 matching of the fall cases and non-fall cases by age and gender was performed. Phase II was a prospective observational study conducted from August 2012 to January 2013 in 10 wards.

Results:
In Phase I of the study, variables of confusion, altered elimination, dizziness and mobility impairment that showed statistical significance were selected in the construction of a simplified 4-item falls assessment tool. In Phase II of the study, the sensitivity scores of the 4-item falls assessment tool and the Hendrick II Falls Risk Model were 81.25% and 75%, specificity scores were 43.60% and 51.31%, respectively.

Discussion & Conclusion:
The 4-item falls assessment tool can be completed within 5 minutes via observation or interview, which is suitable for acute care settings. Study findings suggested that adding more risk factors would not significantly improve the sensitivity of the falls assessment tool. The simplified falls assessment tool that contained fewer risk factors was comparable to the Hendrich II Falls Risk Model in predicting falls.

OP-NR-12

Assessing Inpatient Nurses' Knowledge about Fall Prevention in Tan Tock Seng Hospital (TTSH)

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Background & Hypothesis:
Despite various fall prevention strategies, patient falls persist to be an issue prevalent in acute hospitals. It has been reported that behaviour change based on improving knowledge is probably more sustainable than indirect manipulation of behaviour alone. In Singapore, published data in this aspect is limited. This study aims to provide new information on the inpatient nurses' fall prevention knowledge (including fall-risk assessment, care-planning and management) in TTSH.

Methods:
Using a 15-item structured online questionnaire, this cross-sectional survey surveyed nurses as they are mainly responsible for assessing the fall risk of patients and implementing fall prevention measures. All nurses (n = 2000) working in the wards during the study period were invited to participate, 1022 (51%) of whom responded. The Institutional Review Board approval was sought (Reference: 2015/00040) for the study.

Results:
The findings revealed that nurses' baseline knowledge of facts and concepts in falls prevention knowledge is relatively high. The findings also highlighted 3 areas where their fall prevention knowledge was lacking. The first area was the nurses' weak knowledge in associating fall risk with medication. The second area stemmed from the nurses' misconception of not reinforcing activity limits to patients and their families. The third misconception was that nurses apply bed alarms, regardless of risk.

Discussion & Conclusion:
Based on the findings, the recommendations to overcome the identified knowledge gaps would include tailored training efforts that would involve developing a scenario-based training programme. This ensures that future enhancement efforts in fall prevention would be better targeted and would improve the fidelity of implementing the falls prevention programme to improve patient safety.

OP-NR-13

Impact of an Outcome-based Assessment on Inpatient Nurse Clinicians' Competencies

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Background & Hypothesis:
In the current clinical context, nurse clinicians (NCs) play a vital clinical leadership role in facilitation of safe, quality care delivery. Currently, there is no structured formative assessment on their clinical competencies. The aim of the initiative was to explore the impact of an outcome-based competency assessment using Objective Structured Clinical Examinations (OSCE) to ascertain competencies of inpatient general ward nurse clinicians.

Methods:
Six clinical competencies were identified by the NCs. The competency standards, assessment plan and guide were crafted and validated by 7 designated assessors. The 6 OSCE stations were management of patient receiving intravenous inotropes, tracheostomised patient receiving oxygen therapy, patient receiving high alert medication, patient with neurological deterioriation, life threatening arrhythmias and chest drainage. Each NC was given 20 minutes to complete a station.

Results:
A total of 89% (n = 71) inpatient NCs participated in the assessment; 65 were female and 6 of them were male. Of the 6 competencies assessed, 82% achieved competency for chest drainage management, 77% achieved competency on high alert medications and 76% met competency for intravenous inotropes. Seventy-five percent of them had met their competency on life threatening arrhythmias. However, only half of them were competent in management of neurological deterioriation and tracheostomised patient.

Discussion & Conclusion:
Overall, the NCs reflected on the importance to update their clinical competencies so as to be practising at the top end of their licenses. They also gave the feedback that the assessment approach was structured and realistic. With the utilisation of the assessment, it has provided insight to formalise a structured framework for enhancing NCs' clinical competencies.

OP-PCR-01

Trend in HbA1c Levels among National Healthcare Group Polyclinic Patients Admitted to Tan Tock Seng Hospital in 2013

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Background & Hypothesis:
Hospital admissions have been proposed as an opportunity to improve glycaemic control due to the intense daily exposure to clinical care teams. This study examined the historical trends in HbA1c levels of diabetes patients admitted in medical and surgical disciplines to serve as baseline for comparison for proposed interventions to improve glycaemic control of diabetes patients during admissions.

Methods:
This is a retrospective cohort study of all National Healthcare Group Polyclinic diabetes patients admitted to Tan Tock Seng Hospital in 2013. We extracted HbA1c levels at baseline, 6 months and 12 months after discharge.

Results:
A total of 2682 diabetes patients were identified; 1759 (65.6%) were admitted into medical disciplines while the rest were admitted into surgical disciplines. The medical patients were older (mean age 71.1 years old) compared to surgical patients (mean age 70.0 years old) and had higher baseline HbA1c levels (7.61% vs 7.39%) but comparable in terms of gender and ethnicity. There was a significant difference in HbA1c levels for medical patients 6 months (7.40%), 12 months (7.44%) after discharge compared to baseline (7.61%). For surgical patients, the difference was statistically significant for 6 months (7.16%) but not 12 months (7.34%) after discharge when compared to baseline (7.39%).

Discussion & Conclusion:
Glycaemic control is better in both medical and surgical patients 6 months after discharge but only better in medical patients 12 months after discharge. More research is needed to explore the use of hospital admissions to improve glycaemic control especially in the long-term.

OP-PCR-02

A Study on the Perceptions of Weight Loss among Overweight to Obese Patients with Chronic Disease

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Background & Hypothesis:
Obesity is closely related to the control of hypertension, diabetes and high cholesterol. Dieting through calorie restriction is one of the main strategies to losing weight. This study was conducted to examine the level of awareness on dieting among overweight patients with chronic disease.

Methods:
A cross-sectional study was conducted at 2 polyclinics between March 2014 and September 2014. A structured questionnaire was administered to overweight patients aged 21 to 70 years with either or a combination of hypertension, diabetes or high cholesterol. The survey consisted of 9 commonly held beliefs that had been proven true or false by evidence. Answers were tabulated in a knowledge score. Parametric tests were applied to test the demographic profiles and the knowledge score.

Results:
A total of 358 patients participated in the study. The mean knowledge score was 3.99 out of a maximum of 9 points. Respondents tend to score poorly (3.9% to 45.8%) for all false beliefs but high (67% to 92.7%) for true beliefs. Only the age factor had significant difference ($P = 0.028$) in the total knowledge score. Respondents older than 51 years old fared better than those younger. There was no significant difference ($P > 0.05$) between knowledge scores and other demographic factors. Only 43.3% of respondents had ever tried to lose weight.

Discussion & Conclusion:
Patients with chronic disease and who were overweight were likely to have gaps in their understanding of weight loss and were also poorly motivated to lose weight.

OP-PCR-03

Predicting Sleep Hygiene and Stimulus Control Intentions among Primary Care Patients with Insomnia: An Application of the Theory of Planned Behaviour

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Background & Hypothesis:
Insomnia disorder combines sleep dissatisfaction with significant daytime impairment. In Singapore, 15 percent of the adult population reported chronic insomnia symptoms, which contributes to severe health conditions such as hypertension, heart disease and stroke. Current treatment heavily relies on hypnotic medication. Hence, there is a need to examine adherence to empirically supported, non-pharmacological interventions. This study will apply the theory of planned behaviour (TPB) to analyse the role of attitudes, subjective norm and perceived behavioural control as predictors of intentions to practise sleep hygiene (i.e. adherence towards behavioural habits that ensure good quality sleep) and separately, stimulus control (i.e. adherence towards behavioural techniques which associate sleep with the bed/bedroom).

Methods:
A purpose-designed questionnaire will be verbally administered to a convenience sample of insomnia patients (n = 206) through using an iPad. NHGP primary care clinics will be targeted due to its accessibility, convenience and affordability.

Results:
Descriptive analyses and structural equation modelling will be conducted to identify any determinants of intentions to engage in sleep hygiene and stimulus control practices. Based on available research evidence, it is predicted that attitudes, subjective norms and perceived behavioural control will significantly determine intentions to practise sleep hygiene and stimulus control.

Discussion & Conclusion:
The implementation of the project and its research findings may help primary care practitioners identify suitable non-pharmacologic approaches to treating insomnia. In accordance with TPB, interventions targeted at enhancing patients' self-regulatory capacity would promote sustainable sleep-related health behaviour, thus lowering the rates of insomnia and its severe consequences in Singapore.

OP-PCR-04

The Effect of Life Story Review in Reducing Depression among Community-Dwelling Older Adults with Chronic Disease: A Pilot Study

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Background & Hypothesis:
The research examined the effect of life story review in reducing depression among older adults with chronic disease.

Methods:
This pilot experimental prepost follow-up study was conducted at the National University of Singapore. Twenty-nine Malay participants aged 60 with mild to moderate depression scores were randomly assigned to life story review (intervention) group (n = 14) or non-life story review (control) group (n = 15). Geriatric Depression Scale (GDS-15) was used to measure depressive symptoms 5 times over 8 weeks.

Results:
There was no statistically significant difference between the 2 groups in demographic and baseline reading ($P > 0.05$). Mean depression scores for intervention group were significantly reduced from baseline (mean = 5.9, SDÂ ± 2.3) to week 8 (mean = 1.8, SDÂ ± 1.5) as compared to control group (baseline: mean = 5.0, SDÂ ± 2.0; week 8: mean = 4.5, SDÂ ± 1.7).The change in depression scores of intervention group was significantly higher than control group at week 2 (ÃŸ = 1.67, $P < 0.001$), week 3 (ÃŸ = 1.35, $P = 0.083$), week 4 (ÃŸ = 1.96, $P = 0.001$), and week 8 (ÃŸ = 3.57, $P < 0.001$), after adjusted for baseline depression scores, age, gender and diary habit.

Discussion & Conclusion:
This study supports the use of life story review in reducing mild to moderate depression among community-dwelling older adults with chronic disease. It can be used as a non-pharmacological intervention to delay pharmacological treatment of mild to moderate depressive symptoms in elderly.

OP-PCR-05

The Effects of Different Physiotherapy Follow-Up Intervals on the Recovery of Patients with Shoulder Adhesive Capsulitis (Acute and Subacute): Centre-Randomised Trial

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Background & Hypothesis:
In the literature of physiotherapy management of shoulder adhesive capsulitis, it is recommended that patients attend twice a week of physiotherapy intervention, but such a recommendation is difficult to translate into clinical practice and the feasibility is a concern. This study investigated the change in shoulder active range of motion (AROM) between patients receiving regular follow-up interval (2-week) and patients with irregular/prolonged follow-up interval (>2 week).

Methods:
A total of 46 subjects with shoulder adhesive capsulitis were prospectively recruited from the National Healthcare Group Polyclinics physiotherapy centres to attend up to 6 treatment sessions. The groups were a 2-week follow-up interval group (n = 22) and a prolonged follow-up interval group (n = 24). The main study outcome measures were pain score and the affected shoulder AROM. The between- and within-group differences were analysed using the t-test. ANCOVA was performed for each outcome measure with adjustment of its baseline and the number of sessions attended, followed by bootstrapping.

Results:
The bootstrapped ANCOVA showed a statistically significant difference between the 2 groups in shoulder flexion AROM, 2-week interval group was superior, 11.9 degrees difference, 95% CI, 1.8-20.9, *P* = 0.03. The superiority of 2-week interval group in shoulder abduction AROM was clinically important but not statistically significant, 10.8 degrees difference, 95% CI, -2.9-21.7), *P* = 0.12. There was no statistically or clinically significant difference between the 2 groups on other outcome measures.

Discussion & Conclusion:
The study found that a regular 2-week physiotherapy follow-up interval in managing shoulder adhesive capsulitis could improve shoulder flexion AROM more than irregular prolonged follow-up interval.

OP-PCR-06

Anxiety and its Association with Multimorbidity in the Primary Care Setting

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Background & Hypothesis:
Multimorbidity is defined as the co-occurrence of 2 or more chronic diseases within an individual. The prevalence of multimorbidity ranges from 13.1% to 71.8% as reported in overseas studies. Research evidence consistently demonstrates that people with chronic conditions are 2 to 3 times more likely to experience mental health problems than the general population. The Singapore Mental Health Study showed that the lifetime prevalence of subthreshold generalised anxiety disorder was 2.1%. This study aims to determine the prevalence of anxiety in patients with multimorbidity and whether there is an association between the severity of multimorbidity and anxiety in the primary care setting.

Methods:
Patients with coexisting diabetes, hypertension, and dyslipidaemia were recruited. Eligible patients were approached for an interview and assessed for anxiety using the GAD7 questionnaire. The total number of medications prescribed was used to determine the severity of multimorbidity based on a study by Brilleman and Salisbury (2013).

Results:
A total of 376 patients were recruited for this pilot study. The prevalence of anxiety was 10.1%. In the bivariate analysis, only raised diastolic blood pressure was noted to be associated with the severity of multimorbidity. However, after controlling for the other variables in the multivariate analysis, the association was no longer statistically significant.

Discussion & Conclusion:
This study showed a higher prevalence of anxiety in patients with multimorbidity when compared to the general population. Anxiety was not associated with educational level, socioeconomic status and number of medications prescribed. The unique determinants of anxiety in patients with multimorbidity are yet to be identified.

OP-PCR-07

Multimorbidity and its Association with Depression in the Primary Care Setting

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Background & Hypothesis:
The likelihood of developing one or more chronic illnesses, herein defined as multimorbidity, increases with age. The coexistence of depression in patients with other chronic diseases has been well established. Depression can intensify the effect of chronic illnesses by adversely affecting functioning and decreasing adherence to medical treatment protocol. All of which may lead to difficult clinical courses, such as poorer health outcomes and increased risks of complications. In primary care, many patients have more than 1 chronic medical condition. Our research hypothesis was that severity of multimorbidity would be associated with a higher prevalence of depression.

Methods:
We used the total number of chronic medication prescribed to determine the severity of multimorbidity based on a study by Brilleman and Salisbury (2013). Patients with coexisting diabetes, hypertension, and dyslipidaemia were recruited. Eligible patients were assessed for depressive symptoms using the Patient Health Questionnaire (PHQ-9).

Results:
A total of 376 patients were recruited. The prevalence of depression was 13.3% which was higher than the 11.4% reported by Ho et al (2014). The odds of depression among patients who had someone to accompany them during the clinic visits (OR: 0.43, $P = 0.011$) was 6 times lower than in patients who turned up alone for their clinic visits. No association was found between the number of medication prescribed and depression.

Discussion & Conclusion:
This study casts doubt on using total number of medication prescribed as a proxy for severity of multimorbidity. The association of having someone to accompany for clinic visits with depression needs to be explored further.

OP-PCR-08

The Quality of Life in Patients Suffering from Multimorbidity

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Background & Hypothesis:
The co-occurrence of 2 or more chronic medical conditions is defined as multimorbidity. In the systematic review by Marengoni in 2011, poor quality of life was suggested to be associated with multimorbidity. This study aims to determine the quality of life in patients with multimorbidity, and tests the association between the severity of multimorbidity and quality of life in patients with multimorbidity in the primary care setting.

Methods:
Patients with coexisting diabetes, hypertension, and dyslipidaemia were recruited. Eligible patients were approached for an interview using the EQ5D-3L questionnaire which has 2 components—utility index (UI) and visual analog scale (VAS).

Results:
A total of 376 patients were recruited for this pilot study. The mean UI score was 0.91 (maximum score was 1.00). The VAS score was 75 (maximum score of 100). A higher severity of multimorbidity (represented by a higher number of chronic medications prescribed) was associated with a poorer quality of life. Those who did not have house ownership, had more chronic medical conditions, and were overweight were also associated with a poorer quality of life. Contrary to previous reports in the literature, patients with no formal education had a better quality of life than those with formal education.

Discussion & Conclusion:
The EQ5D results were self-reported by patients and were therefore of more relevance from the patients' perspective. Investigating and understanding the negative association between education level and quality of life would be vital to the provision of patient-centric care in the local context.

OP-PCR-09

Residential Mobility in Public Rental Flat Estates in Singapore and its Association with Health Behaviours at Baseline and at Follow-Up

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Background & Hypothesis:
The study aimed to determine if length of stay in public rental flat enclaves was associated with health behaviours, health screening participation and hypertension management.

Methods:
From 2008 to 2012, residents were recruited from 3 public rental flat enclaves at baseline, assessing for: a) health behaviours; b) health screening participation; and c) hypertension management. Follow-up visits were made 1 year later to determine if residents were still residing there. In 2013 to 2014, 2 enclaves were compared for health behaviours in those who stayed ≥1 year in the community, with residents who newly moved into the enclave in 2013 to 2014.

Results:
Half the residents (51.5%, 345/670) recruited at baseline went on to stay ≥1 year. Site, year (all P <0.05), older age (aOR = 1.66, CI, 1.03-2.65, P = 0.036), diabetes (aOR=1.78, CI, 1.14-2.78, P = 0.011), overweight (aOR = 1.55, CI, 1.03-2.32, P = 0.034) and exercising infrequently (aOR = 2.32, CI, 1.59-3.45, P <0.001) were all associated with staying ≥1 year. There was no association between health screening/hypertension management and staying ≥1 year. On follow-up in 2013 to 2014, compared to new residents (n = 127), residents who already stayed ≥1 year tended to be older (aOR = 3.08, CI, 1.78-5.32, P <0.001) and diabetic (aOR = 1.85, CI, 1.26-2.58, P = 0.013) but exercised more regularly (aOR = 1.42, CI, 1.06-2.94, P = 0.034) and have controlled blood pressure (aOR = 5.26, CI, 1.39-20.0, P = 0.014).

Discussion & Conclusion:
In this low socioeconomic status rental flat population, while at baseline poorer health status was associated with staying ≥1 year in the community, on follow-up, they had better blood pressure control and exercised more compared to new entrants into the community. While poorer health reduces residential mobility, perhaps longer duration of residence in these enclaves encourages healthier behaviours by providing sustained exposure to interventions targeted there.

OP-PCR-10

Perceived Usefulness and Utility of the Community Health Assist Scheme: A Community-based Study

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Background & Hypothesis:
The Community Health Assist Scheme (CHAS) was introduced in 2012 with dual aims of providing medical subsidies for lower to middle income Singaporeans and to encourage utilisation of the private sector. We aim to assess the perceived usefulness and utility of the CHAS card.

Methods:
A community-based, cross-sectional study conducted using standardised face-to-face interviews of 621 randomly selected Singapore citizens from HDB estates in Bedok and Ang Mo Kio, aged 21 to 65, was conducted in February 2015.

Results:
Of 621 respondents, 43.8% were cardholders, with 29.8% and 13.8% holding the blue and orange card, respectively. Overall, 72.6% (95% CI, 67.3-77.9%) found the card to be useful. However, only 41.4% (95% CI, 31.0-51.8%) of orange cardholders found it useful as compared to 85.6% (95% CI, 80.5-90.7%) of blue cardholders (P <0.001). Perceived usefulness is associated with the knowledge of CHAS coverage (P = 0.006) and awareness of nearby CHAS clinics (P = 0.008). A total of 70.3%, 59.5%, 31.5% and 27.7% of cardholders have utilised their cards for acute care, chronic care, health screening and dental services, respectively. Usage is associated with knowledge (P <0.001) and awareness of nearby CHAS clinics (P <0.001). The top reason for a lack of utilisation is the perception that the card does not provide benefits.

Discussion & Conclusion:
Majority of cardholders found CHAS useful and had utilised their cards. As perceived usefulness and utility are associated with the degree of knowledge held, raising awareness in areas with a knowledge deficit may increase the utility of CHAS, with hopes to better achieve the dual aims of CHAS.

OP-PCR-11

Awareness and Uptake of CHAS: Why Aren't People on CHAS?

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Background & Hypothesis:
The Community Health Assist Scheme (CHAS), a household subsidy scheme, was introduced in 2012 to subsidise the healthcare costs of Singapore citizens from lower and middle income households. Given increasing healthcare costs, we aim to establish the level of awareness and uptake rates of CHAS, and to ascertain current barriers and possible solutions.

Methods:
A community-based cross-sectional study was performed with face-to-face interviews using a standardised questionnaire. A total of 621 randomly selected Singapore citizens and permanent residents from HDB estates in Bedok and Ang Mo Kio, aged between 21 and 65 were interviewed.

Results:
Of 621 respondents, 76.2% were eligible for CHAS, 82.4% were aware of CHAS and 30.2% were aware of the income eligibility criteria. Age (OR: 2.60, 95% CI, 1.681-4.021), location (neighbourhood) (OR: 0.622, 95% CI, 0.408-0.947) and per capita household income ($P = 0.004$) significantly affected awareness. There were 57.5% of eligible citizens who were cardholders, with 29.5% reporting presumed non-eligibility as the top reason for not being on CHAS, and a lack of knowledge in CHAS application following at 25.5%. Age (OR: 1.897, 95% CI, 1.237-2.909), housing type ($P < 0.001$) and per capita household income ($P < 0.001$) significantly affected uptake.

Discussion & Conclusion:
While the overall awareness of CHAS has improved, specific awareness has fared less favourably, especially that of eligibility criteria, till it has impacted the uptake of CHAS amongst those eligible. In addition, this improvement in awareness has not translated to uptake, and this is worth exploring further. As age both affects awareness and uptake, age-stratified interventions can be considered.

OP-PCR-12

Knowledge, Attitudes and Practices towards Antibiotic Use for Upper Respiratory Tract Infections among Primary Healthcare Patients in Singapore

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Background & Hypothesis:
Patients' expectations can influence antibiotic prescription by general physicians (GPs). We assessed knowledge, attitude and practices towards antibiotic use for upper respiratory tract infections (URTIs) among primary care patients in Singapore, and if these were associated with wanting antibiotics.

Methods:
Adult patients at GP clinics with URTI symptoms of 7 days or less were surveyed. Multivariate logistic regression was used to assess if demographics, presenting symptoms, knowledge, attitudes, and practices of URTI and antibiotics use were associated with whether a patient wanted antibiotics.

Results:
Of 914 participants, one-third expected antibiotics (n = 307); of these, 40% (n = 121) would ask for antibiotics, and 10% (n = 31) would see another doctor if antibiotics were not prescribed. Highly prevalent misconceptions were "antibiotics are effective against viruses" (78%, n = 715) and "antibiotics cure URTI faster" (65%, n = 594). Poor practices include "keeping antibiotics stock at home" (12%, n = 125) and "taking leftover antibiotics" (14%, n = 114); these practices were significantly correlated with each other (P <0.001) and with wanting antibiotics. On multivariate regression, factors independently associated with wanting antibiotics include: perception that illness is serious (OR: 1.70; 95% CI, 1.27-2.27), belief that antibiotics cure URTI faster (OR: 5.35; 95% CI, 3.76-7.62) and not knowing URTI resolves on its own (OR: 2.18; 95% CI, 1.08-2.06). Postsecondary education was inversely associated with wanting antibiotics (OR: 0.67; 95% CI, 0.48-0.94). Those with less years of education were also significantly more likely to have several misconceptions about antibiotics and URTI.

Discussion & Conclusion:
Key misconceptions on the role of antibiotics in URTI are prevalent and associated with wanting antibiotics. Health education programmes addressing these misconceptions should be considered.

OP-PCR-13

Incidence of Hyperkalemia and Significant Creatinine Rise Associated with ACEI or ARB Initiation in Primary Care of Singapore

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Background & Hypothesis:
Adverse drug reactions (ADRs) of ACEi (angiotensin-converting enzyme inhibitor) and ARB (angiotensin receptor blocker) were widely reported. However, ADRs of ACEi or ARB were not yet evaluated in Singapore. There is a difference on the occurrence of hyperkalemia and significant serum creatinine rise between ACEi and ARB when they are initiated. The secondary objective of the study is to examine whether there is an association between significant serum creatinine rise and hyperkalemia as ADRs and patients' characteristics including age, agender, race, and baseline serum creatinine when ACEi or ARB is initiated.

Methods:
This is a retrospective cohort study which involved 5 polyclinics of the National Healthcare Group (NHG). The participants who fulfill the inclusion criteria of the study were identified from the NHG polyclinics database and randomly selected by using Excel software. STATA SE 12 was used to analyse the data.

Results:
A total of 1000 ACEi users and 1000 ARB users were recruited in the study. The result has shown there is no difference on the occurrence of hyperkalemia ($P = 0.768$) and significant serum creatinine rise ($P = 0.768$) between ACEi and ARB when they are initiated. The baseline potassium is associated with occurrence of hyperkalemia ($P < 0.001$) while age is associated with significant serum creatinine rise ($P = 0.034$) when ACEi and ARB are initiated.

Discussion & Conclusion:
There is no difference on the occurrence of hyperkalemia and significant creatinine rise when ACEi or ARB is initiated. Baseline potassium level and age is associated with occurrence of hyperkalemia and significant creatinine rise respectively.

OP-PCR-14

Promoting DASH (Dietary Approaches to Stop Hypertension) Diet for Newly Diagnosed Hypertensive Patients in Primary Care Setting: Challenges and Interventions

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Background & Hypothesis:
The Dietary Approaches to Stop Hypertension (DASH) diet has strong evidence in lowering blood pressure. However, clinicians within the National Healthcare Group Polyclinics do not know enough of the DASH diet to promote it and patients are not aware of the diet to be keen to adopt it. Baseline data collected from September 2013 to February 2014 at Toa Payoh Polyclinic showed only 2.7% (n = 24) of 897 newly-diagnosed hypertensive patients, were referred to the dietitian or care managers for DASH diet.

Methods:
A sample survey was conducted with 25 clinicians and 45 patients to assess their awareness of DASH diet. An introductory DASH workshop was piloted gathering more information on patients' willingness in adopting DASH. Four interventions were carried out targeting on the 3 root causes found.

Results:
We found that 87% of clinicians have heard of DASH diet but only 8% had knowledge of DASH nutrients components. Sixty-percent of clinicians wished to learn about DASH through dietitian talks and 87% of patients surveyed have not heard of DASH diet. The 3 causes for low referral of DASH were lack of clinician's knowledge, low patients' awareness of DASH diet and no systematic referral.

Discussion & Conclusion:
A 46% increase in referrals was achieved within 6 months. Referrals increased only modestly despite educational dietitian talks. Reminders such as sticker prompts on clinic computer screens and pharmacist referral intervention significantly increased the referral rate. When clinicians are aware of the evidence-based benefits of DASH diet, they became more confident to refer hypertensive patients to the DASH diet. Ongoing publicity is vital in ensuring patients' adoption of DASH.

OP-PCR-15

Outcomes of a Multidisciplinary Team (MDT) Approach for Poorly Controlled Diabetic Patients with Psychosocial Issues

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Background & Hypothesis:
Poor control of diabetes results in morbidity and premature mortality. Coexisting psychosocial problems frequently creates complex management issues that are poorly managed in a doctor-centric primary care model. Our study aims to determine if a team-based approach would result in better glycaemic outcomes.

Methods:
In National Healthcare Group Polyclinics, diabetic patients with HbA1C above 9% are screened for adherence, psychological, social, financial, and cognitive issues. In this study, patients with psychosocial issues were identified for multidisciplinary team (MDT) discussions, led by a doctor, nurse and medical social worker. The team created a care plan and coordinated follow-up care. A total of 85 patients were recruited from January 2012 to December 2013. We studied the baseline demographic factors, psychosocial issues identified and diabetes control at baseline and 1 year.

Results:
Mean age of the patients was 63.4 years; 81.2% had coexisting complications, such as chronic kidney disease, heart disease or stroke. After screening, 84.7% had dietary or medication adherence issues, 18.8% had depression, 37.7% had financial issues, 30.6% had interpersonal problems and 9.4% were found to have cognitive impairment. One year after MDT discussions were initiated, there was a significant increase in patients whose HbA1C was 9% and below (48.2% vs 36.2%, *P* = 0.081).

Discussion & Conclusion:
Our pilot study shows that a multidisciplinary team approach might be beneficial for diabetic patients with poor glycaemic control and psychosocial issues. Further study of the impact of psychosocial issues on management strategies is required.

OP-PCR-16

Outcomes of a Pilot Memory Clinic in Choa Chu Kang Polyclinic

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Background & Hypothesis:
Recent studies have estimated the prevalence of dementia in those 60 and above as 10%. As primary care providers, polyclinics are well placed for early detection and management of dementia. The Choa Chu Kang Memory Clinic represents a novel team-based model aimed at training the primary care team in providing dementia care. It is led by a psycho-geriatrician from National University Hospital and a team of family physicians, care managers and medical social workers.

Methods:
We describe the profiles of patients referred for assessment of memory loss to the Memory Clinic from August 2013 to December 2014, and the outcomes of assessment.

Results:
A total of 101 patients were referred for memory loss to the Memory Clinic. Out of those patients, 52.5% (53) of them were diagnosed with dementia, 7.9% (8) were found to have mild cognitive impairment, 3% (3) depression, 4% (4) anxiety, 3% (3) delirium, 2% (2) had suspicious neurological signs requiring referral to a neurologist, and 27.7% (28) were found to be normal. Of these patients, only 2 required referral to the tertiary hospital for further evaluation.

Discussion & Conclusion:
The results from this pilot Memory Clinic show that patients with suspected memory loss can be effectively assessed at the primary care setting, with guidance and training from specialists. This model of care allows patients access to diagnosis at their primary care centre, as well as comprehensive dementia care consisting of treatment, education, caregiver training and support. This enables the patients to remain well cared for in their community and reduces referrals to the hospital.

OP-PCR-17

Exploring Predictors of Suicide Risk: Primary Care in Singapore

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Background & Hypothesis:
Suicide is a public health problem that has gained global attention. Suicide statistics in Singapore (2000 to 2004) was reported as approximately 350 suicides per year, or 1 suicide per day (Chia & Chia, 2010). Suicide can be triggered by a combination of factors. Identifying patients at risk of suicide can be a challenge. Early detection of risk factors is important for healthcare professionals to execute appropriate preventive steps and make suitable referrals to specialists. This study explored potential predictors of suicide risk in primary care.

Methods:
A total of 152 adult patients that were seen in 2014 and reported suicide risks during psychology consultations in National Healthcare Group Polyclinics were selected. Their demographic data (gender, age, ethnicity, education, employment status, psychiatric history, marital status); presence of chronic disease, mental health [(Patient Health Questionnaire-9, PHQ-9), Generalized Anxiety Disorder-7 (GAD-7), Insomnia Severity Index (ISI)]; and functioning variables [(Global Assessment of Functioning (GAF), Sheehan Disability Scale (SDS) as well as suicide risk assessment, i.e. SADPERSONS Scale and P4 Suicidality Screener (P4) results], were analysed using multiple regression analysis.

Results:
The predictors, demographics (gender, age, ethnicity, marital status) and for functioning, GAF, showed significant relationships with the SADPERSONS scale. No significant findings were observed for chronic disease and mental health. None of the variables showed significant relationship with the P4.

Discussion & Conclusion:
In assessing for suicide risk in primary care, demographic and functioning variables should be included. The SADPERSONS scale facilitates this that appears more useful than focusing on cognitions and behaviours of people with suicide risk, reflected by the P4.

OP-PCR-18

Brief CBT for Insomnia: Primary Care in Singapore

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Background & Hypothesis:
Research in Singapore reported a high number of referrals for insomnia from primary care (75.9%) to tertiary institution. More than half (51.8%) the patients received treatment from family physicians. Thus, the significance of primary care is that it is the first-line treatment for addressing insomnia. Risks of sedative medications, such as long-term dependence and side effects; increased recognition of non-drug interventions; greater pressure to develop brief, cost-effective interventions and effective outcomes for sleep improvement; suggest the importance of developing brief interventions for managing insomnia in primary care. This present study aimed to compare the effect on patients' insomnia before and after 2 sessions of brief CBT for insomnia (CBT-I) in Singapore's primary care.

Methods:
Fifty-two adult patients who underwent brief CBT-I with psychologists were identified. Their medical records were retrieved to obtain their scores on the Insomnia Severity Index (ISI), in their first and third psychological consults. Given their ISI scores were not normally distributed, the scores were compared using the Wilcoxon signed-ranks test.

Results:
The findings showed significant improvement in the participants' insomnia after 2 sessions of brief CBT-I ($Z = -5.45$, $P = 0.00$, $r = -0.76$). The Mdn ISI scores before intervention was 10.50 (i.e. subthreshold insomnia; IQR, 9.00-13.00). After 2 sessions, the Mdn ISI scores was 5.00 (i.e. no clinically significant insomnia; IQR, 2.00-8.00).

Discussion & Conclusion:
The effectiveness of 2-session brief CBT-I to address insomnia in primary care setting in Singapore was supported, reflecting a promising direction for shaping structured, brief and effective sleep improvement strategies in primary care.

OP-PCR-19

CBT for Chronic Insomnia: An RCT of Additive Components of Mindfulness or Cognitive Therapy

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Background & Hypothesis:
Effectiveness of cognitive behavioural therapy (CBT) for treating primary insomnia is well established. However, a subset of patients do not improve. Average overall improvements are around 50%. This study investigated whether additional sessions of cognitive therapy and/or mindfulness-based cognitive therapy could enhance a standardised form of CBT for insomnia in primary care.

Methods:
Fifty-seven participants with primary insomnia in a randomised controlled trial received 4-session CBT. They were subsequently randomly assigned for additional 4 sessions of CT or MBCT. The outcome measures were reported Insomnia Severity Index (ISI), Pittsburgh Sleep Quality Inventory (PSQI), sleep logs (total sleep time) and objective measures of total sleep time (actigraphy).

Results:
CBT produced significant improvement in insomnia severity reflected by ISI, PSQI, sleep logs and actigraphy (baseline M = 18.21, 12.97, 300.82, and 347.06 respectively; post-CBT M = 10.39, 7.72, 387.89, and 446.71 respectively; P <0.001). Additive components of CT and MBCT revealed further improvement in insomnia severity compared to pretreatment (baseline M = 8.45, 6.38, 400.36, and 460.46 respectively; post-treatment M = 6.21, 5.34, 433.52, and 483.26 respectively; P <0.001). The effect size of the combined treatment was large (0.75 and 0.73 for additional sessions of MBCT and CT, respectively) with 61.4% participants no longer meeting criteria of clinical insomnia.

Discussion & Conclusion:
The evidence for 4-session brief CBT is supported. Additive components of CT and MBCT achieve clinically significant outcomes and further enhance sleep improvement for people with primary insomnia. This has useful implications for effective, structured, targeted sleep improvement interventions for primary care.

OP-PCR-20

Effectiveness of a Patient-based Health Education Intervention in Reducing Antibiotic Use for Acute Upper Respiratory Tract Infections in the Private Sector Primary Care Setting n Singapore

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Background & Hypothesis:
We investigated the effectiveness of patient-targeted education in reducing antibiotic prescriptions for upper respiratory tract infections (URTIs) amongst adults in the private primary care setting in Singapore.

Methods:
Our randomised controlled trial enrolled patients aged 21 years and above presenting at GP (general practitioner) clinics with URTI symptoms for 7 days or less. Intervention arm patients were verbally educated via pamphlets about the aetiology of URTIs and role of antibiotics in treating URTIs. Control arm patients were educated on influenza vaccinations. Both arms were compared on proportions prescribed antibiotics and patients' postconsultation perceptions.

Results:
A total of 914 patients consulting 35 doctors from 24 clinics completed the study (457 in each arm). Demographics in both arms were similar. Out of these patients, 19.1% were prescribed an antibiotic, but this varied from 0% to 70% for individual GPs. The intervention did not significantly reduce antibiotic prescriptions (odds ratio [OR]: 1.20, 95% confidence intervals [CI], 0.84-1.72) except in patients of Indian ethnicity (OR: 0.32, 95% CI, 0.14-0.75). Intervention arm patients were more likely to agree that the education improved their understanding of URTI causes (Spearman's rho 0.13, P <0.001). However positive effects on the view that antibiotics were not needed most of the time for URTIs (Spearman's rho 0.20, P = 0.047) and being worried about the side effects of antibiotics (Spearman's rho 0.24, P = 0.018) were restricted to the Indian subgroup.

Discussion & Conclusion:
Our educational intervention was effective only in the Indian ethnic subgroup. Follow-up studies to investigate differences in responses to educational programmes between ethnicities, and to assess GP-targeted interventions, are recommended.

PP-AH-01

Help-Seeking from Traditional Healers among Older Adults

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Background & Hypothesis:
Traditional healers (THs) are often excluded stakeholders in healthcare. However, they represent an important source of help for some groups of older adults, especially those who perceive treatments offered by these alternative providers more congruent with philosophies about their illness. We aimed to determine the prevalence of older adults who seek help from THs and identify sociodemographic, medical and psychiatric correlates of help-seeking from THs in this population.

Methods:
Data from 2563 older adults, who participated in the nationwide Well-being of the Singapore Elderly study, were used in the analysis. A protocol adapted from the 10/66 research group was used to collate information pertaining to sociodemographics, help-seeking from a TH, as well as medical and psychiatric conditions. Associations were tested using multiple logistic regression analyses.

Results:
A total of 10.4% of the sample had sought help from a TH in the past 3 months. They were more likely to be women (odds ratio (OR): 1.2), with secondary school education (vs tertiary education; OR: 1.2), those who had arthritis/rheumatism (OR: 1.6), stomach/intestine problems (OR: 2.1) or anxiety (OR: 26.3). Individuals who were least likely to seek help from a TH were Hindu (OR: 0.2) or Muslim (OR: 0.2).

Discussion & Conclusion:
THs appear to be a preferred source of help among some elderly groups. Notably, older adults who suffer from chronic conditions that are painful and difficult to treat using Western medications are more likely to visit THs. Future research should focus on the impact of seeking help from these alternative healthcare providers in terms of clinical outcomes and costs.

PP-AH-02

Predictors of Adaptive Functioning in Children and Adolescents with Autism Spectrum Disorders

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Background & Hypothesis:
Individuals with autism spectrum disorders (ASD) are often reported to have lower levels of adaptive functioning. This not only impacts their quality of life, but also has practical implications for caregiving and management. Identifying predictors of adaptive functioning can inform and guide early intervention and facilitate remediation. It was hypothesised that age of first words and severity of social communication deficit would predict level of adaptive functioning in individuals with ASD.

Methods:
The parent/caregiver rating form of the Vineland Adaptive Behaviour Scales – Second Edition, and Social Communication Questionnaire (SCQ) were administered to the main caregivers of 45 participants (40 males and 5 females), aged between 6 and 19 years old (M = 11.72, SD = 3.47). Demographic information was also collected.

Results:
Results from multiple regression analysis indicated that age of first words, diagnosis and SCQ total score, were found to significantly predict level of adaptive functioning in children with ASD, $F_{(3, 41)}$ = 4.756, P = 0.006. These 3 variables accounted for 25.8% of the variance in participants' level of adaptive functioning.

Discussion & Conclusion:
The findings were consistent with existing literature. Children with ASD would likely display greater deficits in their adaptive functioning when they experience greater delay in their acquisition of speech and face more difficulties with social communication. The level of their adaptive functioning also reflects their diagnosis. It is recommended that early intervention programmes focus on the development of basic skills to improve adaptive functioning in children with ASD.

PP-AH-03

Adaptive Profiles in Children and Adolescence with Autism Spectrum Disorder: A Systematic Review

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Background & Hypothesis:
A comprehensive assessment of autism spectrum disorder (ASD) usually includes an evaluation of adaptive functioning for the purpose of better characterising the individual's needs and also to inform treatment planning. This review examines the evidence for the presence of an adaptive "autism profile" among children and adolescence diagnosed with ASD.

Methods:
Systematic literature searches were conducted on PsycINFO, MEDLINE and ERIC databases using the search terms: 1) autism, ASD, PDD-NOS, or Asperger; 2) adaptive or functional; 3) profile or function, behaviour or patterns. The search was limited to peer reviewed journals published in English between 2005 to mid-2015. The initial search yielded 458 unique results. Using the following inclusion criteria: 1) includes sample diagnosed with ASD; 2) involves children age below 21; and 3) reports at least 1 validated measure of adaptive functioning; 33 articles were included in this review.

Results:
A total of 23 articles focused only on the ASD population, while the remaining 10 compared individuals with ASD with non-ASD. Individuals with ASD were found to have significantly lower composite adaptive scores. Longitudinal studies (n = 3) did not report changes in the adaptive functioning of individuals with ASD across time. No consistent "autism profile" was indicated in the review.

Discussion & Conclusion:
The absence of a consistent profile and the variability in adaptive functioning among individuals with ASD highlights the importance of individualised education and treatment planning by focusing on areas of strengths and addressing specific weaknesses in functioning to effect the best outcome for individuals with ASD.

PP-AH-04

Nutritional Status and its Impact on Functional Ability and Quality of Life in Advanced Chronic Obstructive Pulmonary Disease Patients

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Background & Hypothesis:
Malnutrition is common among chronic obstructive pulmonary disease (COPD) patients and is associated with greater morbidity and mortality. Weight loss and muscle weakness in malnourished patients may adversely impact functional capacity, leading to deterioration in quality of life (QoL). We aim to evaluate the prevalence of malnutrition in advanced COPD patients, its association with functional capacity and its impact on QoL.

Methods:
We present cross-sectional data from an ongoing study undertaken by the Department of Palliative Medicine, Respiratory Medicine and Nutrition and Dietetics. Nutritional status was evaluated using the Subjective Global Assessment (SGA), handgrip strength, as well as anthropometric measurements including body mass index (BMI), triceps skinfold thickness and mid-arm circumference. Functional capacity was measured using the Modified Barthel Index (MBI). COPD-specific QoL was assessed using the St George's Respiratory Questionnaire (SGRQ). Statistical analysis was performed using independent samples t-test.

Results:
A total of 131 subjects were recruited. Two-thirds of the subjects have stage 3 and one-third have stage 4 COPD. Their mean age was 71.8 +/- 7.9 years and 22% of the subjects were malnourished (SGA grade B and C). Malnutrition was associated with poorer anthropometric measurements (all P <0.001), weaker grip strength (18.9 vs 23.4, $P = 0.001$), greater functional impairment (MBI 88.1 vs 94.3, $P = 0.032$) and depressed QoL (SGRQ 45.6 vs 38.7, $P = 0.031$).

Discussion & Conclusion:
Malnutrition is prevalent in advanced COPD and is associated with greater functional impairment and reduced QoL. It is important to address malnutrition in advanced COPD through early assessment and nutritional interventions.

PP-AH-05

Enhancing Mealtime Experience for Residents in a Singapore Nursing Home

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Background & Hypothesis:
Mealtimes are opportunities for nursing homes (NH) to integrate care and allows for socialisation amongst residents and staff. A positive mealtime experience aids in adding social engagement and improving quality of life (QOL) (Kerse et al, 2005). Evidence has shown that by improving staff knowledge and making environmental changes, QOL is improved in NHs (Mathey et al, 2001). The purpose of this study was to identify the factors influencing mealtimes experience and outcomes when a staff training programme was introduced to address these factors in a Singapore NH facility.

Methods:
This qualitative study consisted of 3 phases and was conducted in a Singapore NH. Phase I: problems were identified by observing mealtimes (n = 46) at 3 different wards and by interviewing residents (n = 6) and staff (n = 4). Factors that affected residents' mealtime experience included: 1) inadequate mealtime supervision by staff; 2) poor environment; and 3) lack of enforcement. Phase II: improvement strategies including ward-based training and a person-centred care workshop were implemented. Phase III: outcomes of the intervention were reviewed using interview and observational method.

Results:
Results showed improvement in the residents' mealtime experience. Staff were equipped with knowledge to help residents overcome physical and cognitive limitations during mealtimes. Staff also recognised the importance of a positive mealtime experience and improved their work processes.

Discussion & Conclusion:
A good mealtime experience improves the QOL. This study suggests that a person-centreed programme comprising training, guidelines and a monitoring system for oral feeding will encourage staff to facilitate a positive mealtime experience for NH residents.

PP-AH-06

Validation of Stability of Coagulation Factors of Fresh Frozen Plasma

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Background & Hypothesis:
According to current guidelines established by AABB, administration of fresh frozen plasma (FFP) should be carried out within a period of 24 hours post-thawing. Presently, there is no defined quality control parameter governing the minimum amount of Factor VIII (FVIII) required in a unit of FFP by AABB. As this study is based in the AABB-accredited Blood Transfusion Services of National University Hospital, on account of the lack of specifications for FVIII levels, certain European Directorate for the Quality of Medicines & HealthCare (EDQM) guidelines are used as a basis for this study. This paper evaluates the stability of coagulation factors in FFP at different time intervals within a period of 24 hours post-thawing, using FVIII levels as a parameter for validation.

Methods:
A total of 10 donor units of 200 mL to 250 mL of FFP that were unsuitable for clinical use were collected. Each unit was thawed and separated into 3 bags; each bag allocated a different timing to be tested at post-thawing—bag 1: 0 hour, bag 2: 8 hours, bag 3: 24 hours. An aliquot is taken from each bag to be tested for FVIII levels.

Results:
Preliminary results show that FVIII levels within a 24-hour period still fall within acceptable range of >0.70 IU/mL.

Discussion & Conclusion:
The coagulation factors of FFP are still stable within 24 hours post-thawing based on FVIII levels which are shown to be acceptable according to EDQM guidelines (>0.70 IU/mL), when tested within the recommended period of 24-hours stated by AABB standards.

PP-AH-07

Impact on Older Patients' Walking Independence When Barriers towards Maximising their Mobility in the Geriatric Wards are Addressed

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Background & Hypothesis:
Prolonged bed rest and reduced physical activity can result in decline in walking independence in hospitalised patients (Mahoney et al,1998). Barriers such as a lack of walking aids and nursing assistants hinder the maximisation of patients' mobility (Doherty-King & Bowers, 2013). This study aims to evaluate the impact on older patients' walking independence when barriers to mobility are addressed.

Methods:
An earlier survey conducted identified the main barriers towards nurse's ability to mobilise patients (Tan et al. 2014). These barriers include the lack of communication of patient's mobility status and poor access to walking aids. The intervention consists of a mobility status label and placing a walking frame within each ward cubicle. Subjects were recruited between February 2015 to April 2015 from Khoo Teck Puat Hospital in the geriatric wards. Statistical analysis using Mann-Whitney U (SPSS) was performed to compare walking independence at premorbid, admission and upon discharge.

Results:
At premorbid, both the intervention (n = 26) and control group (n = 24) have similar walking independence (P >0.05). On admission, subjects of the intervention group are more dependent in walking than the control group (P <0.05). However upon discharge, both groups have similar walking independence (P >0.05), even though both groups did not return to their premorbid walking independence.

Discussion & Conclusion:
This study shows that addressing barriers to mobility for older patients can improve their walking independence during their hospitalisation. This might have implications on the average length of stay and the return of the older patient to the community after being discharged from an acute medical episode.

PP-AH-08

Risk Factors for Recurrent Clostridium Difficile Infection among Hospitalised Patients in Singapore

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Background & Hypothesis:
Clostridium difficile infection (CDI) is a common nosocomial infection with 20% to 25% recurrence. Risk factors for recurrent CDI may guide development of strategies to reduce recurrent CDI and improve clinical outcomes. To define the rate of and risk factors for recurrent CDI, we conducted a retrospective cohort study among patients hospitalised with CDI.

Methods:
The study was conducted in Tan Tock Seng Hospital from January 2012 to December 2012. CDI episodes which developed within 2 to 8 weeks from the last episode of CDI was considered recurrent CDI. Univariate variables with $P < 0.1$ was entered into a logistic regression to determine independent risk factors of recurrent CDI.

Results:
Of the 193 patients included, 165 (85.5%) patients received metronidazole and 23 (12.2%) patients received regimens containing vancomycin either sequentially to or concurrently with metronidazole. Median duration treatment was 13 (2 to 51) days. There were 28 (14.5%) patients who had at least 1 recurrent CDI. Univariate variables associated with recurrent CDI were age (OR: 1.04, 95% CI, 1.00-1.08), Charlson's score (OR: 1.18, 95% CI, 1.02-1.36) and use of H2-receptor antagonists (H2RA) (OR: 6.66, 95% CI, 2.75-16.12). On multivariate regression analysis, concurrent H2RA use (OR: 10.09, 95% CI, 2.97-34.30, $P < 0.01$) was an independent risk factor for recurrent CDI while concurrent bacterial infection (OR: 0.31, 95% CI, 0.12-0.79) was independently associated with reduced risk of CDI recurrence. Subgroup analysis showed that patients with concurrent infection had significantly longer duration of CDI treatment (median IQR, 14 (3-51) vs 12 (2-47) days, $P < 0.05$).

Discussion & Conclusion:
Concomitant use of H2RA was significantly associated with increased risk of recurrent CDI.

PP-AH-09

Defining the Role of the Pharmacist in a General and Acute Care Hospital's Accident and Emergency (A&E) Department

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Background & Hypothesis:
Patient care in the A&E setting is fast paced, with healthcare providers attending to multiple patients concurrently. With high patient loads and frequent interruptions, there is a high risk of medication errors. Medication orders for KTPH's A&E department are verified remotely without an on-site pharmacist. This study was designed to characterise pharmacist interventions on A&E medication orders and define pharmacists' potential roles in A&E.

Methods:
Pharmacist interventions on A&E medication orders were tracked over 3 months. Information such as priority levels of patient care (P1—most critically ill vs P4—least critically ill) and potential-for-harm (PFH) of interventions were analysed. Interventions were classified into 5 PFH categories, namely: "insignificant", "significant", "serious", "life-threatening" and "unable to determine". We focused on interventions made for the more critically ill patients from P1 and P2 areas.

Results:
One-hundred-and-forty-nine (10%) of 1521 interventions were made for P1 and P2 patients. There were 10 "significant", 9 "serious", 116 "insignificant", 14 "unable to be determined" and no "life-threatening" PFH interventions made. PFH for most interventions were "insignificant", for example: missing chronic medication orders, medication appropriateness and dose adjustment for renal or hepatic impairment, which mostly resulted from incomplete medication reconciliation or insufficient drug information.

Discussion & Conclusion:
Although most interventions had low PFH, they were essential for completeness of medication orders and patient safety. From the interventions collected, we concluded that the role of an A&E pharmacist lies mainly in performing complete medication reconciliation and providing prescribers with drug information to optimise patient care.

PP-AH-10

Demographic Predictors of CBCL (6-18) Syndrome Scales in an Outpatient Psychiatric Clinic in Singapore

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Background & Hypothesis:
Studies have shown that family and parenting characteristics are consistently associated with problematic behaviours in children. This study attempts to identify demographic factors that may predict elevated scores on the syndrome and DSM-oriented scales of the Child Behavioral Checklist (CBCL) in children presenting at an outpatient psychiatric clinic in Singapore.

Methods:
The sample included 98 children (M = 10.79, SD = 3.19) with 72.4% males (n = 71), and 27.6% females (n = 27). Demographic information and CBCL parent-reports were obtained when the children presented at the clinic. Multiple regressions were conducted.

Results:
Mothers with lower education reported increased rule-breaking behaviours, $R^2 = 0.020$, F (1,96) = 5.56; aggressive behaviours, $R^2 = 0.022$, F (1,96) = 5.39; conduct problems, $R^2 = 0.004$, F (1,96) = 8.50; and symptoms of oppositional defiant disorder, $R^2 = 0.045$, F (1,96) = 4.12, as well as externalising problems, $R^2 = 0.050$, F (1,96) = 3.95, in their children. Gender is a significant predictor for anxious/depressed syndrome scale score, $R^2 = 0.036$, F (1,96) = 4.51. Females (M = 61.4, SD = 9.78) tend to report more anxious/depressed symptoms than males (M = 57.5, SD = 7.34); t (96) = -2.12, *P* = 0.036. Ethnicity significantly predicts withdrawn/depressed syndrome scale score, $R^2 = 0.018$, F (1,96) = 5.74, and internalising problems, $R^2 = 0.027$, F (1,96) = 5.06.

Discussion & Conclusion:
Our result is consistent with the current literature. Support in the form of parenting programmes such as to facilitate better understanding of child and improve family interactions could be beneficial for at-risk group of families and children. Future studies could investigate the effectiveness of these parenting or preventive programmes and further explore and identify risk factors in the community.

PP-AH-11

Online Parenting Programmes to Improve Children's Disruptive Behaviours: A Systematic Review

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Background & Hypothesis:
Online parenting programmes have been increasingly employed because of advancement in technology. However, the effectiveness of these programmes has yet to be established. This study aims to evaluate the evidence of these programmes in the current literature.

Methods:
A systematic literature search was conducted using PubMed, PsycINFO, Medline, and Scopus. Search terms included "online", "web", "Internet", "cyber", "parenting", "parent training", "children", "disruptive", "problem", "mental health" and "disorder". The initial search returned 674 papers. Fifty-two articles were identified based on a review of abstracts and assessed for eligibility using the following criteria: 1) online delivery of programme content; 2) programme that focuses on improving children's disruptive behaviours; and 3) experimental in nature. Fourteen articles were subsequently included in this review.

Results:
Five studies reported improved outcomes for online parenting programmes compared to waitlist controls. One study conducted an 18-month follow-up and found sustained improvements in the child's behaviour and positive parenting practices. However, an online programme delivery was found to be non-superior to face-to-face training (n = 2) but was equally effective compared to self-help workbook delivery (n = 1). Four studies reported effectiveness of the online parenting programme without a comparison group. One study reported on the parent's satisfaction instead of programme effectiveness.

Discussion & Conclusion:
Our review suggests that web-based parenting programmes are promising in reducing children's problematic behaviours and improving parent-child interaction. Future studies could focus on examining the frequency, intensity and programme content which are important factors in influencing programme effectiveness. The utilisation of standardised outcome measures and replication in different population would also be important.

PP-AH-12

Network Meta-analysis and Cost-effectiveness Analysis of Triazole Antifungal Prophylaxis

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Background & Hypothesis:
Invasive fungal infection (IFI) is associated with high mortality and economic burden. We evaluated the clinical and pharmacoeconomic evidence of triazole prophylaxis in at-risk patients with haematological malignancies or haematopoietic stem cell transplant (HSCT).

Methods:
We searched PubMed and the Cochrane Library up to November 2014. A network meta-analysis (NMA) of randomised controlled trials (RCTs) on fluconazole, itraconazole capsule and solution, posaconazole and voriconazole was conducted. The outcomes of interest included incidence of IFI, mortality, need for empirical therapies and rate of discontinuation. A 2-part decision-analytic model was performed from patient perspective over a lifetime horizon. Transition probabilities between health states were derived from the NMA, local hospital and epidemiological data. Resource use and their costs were obtained from a local hospital.

Results:
Data from 5512 participants in 21 RCTs were included. All triazole antifungals were significantly better than placebo in reducing IFIs except itraconazole capsule. Posaconazole was significantly better than fluconazole and itraconazole capsule in preventing IFIs, and than other triazoles in preventing invasive Aspergillus infections. Posaconazole significantly reduced all-cause mortality as compared to fluconazole and itraconazole solution. The incremental cost-effectiveness ratio (per life-year saved and IFI avoided) of itraconazole solution was lower than that for posaconazole. Itraconazole capsule and voriconazole were dominated (more costly, less effective) by fluconazole and posaconazole respectively.

Discussion & Conclusion:
All triazole antifungals except itraconazole capsule were effective in preventing IFI. Posaconazole was significantly better in reducing IFI and all-cause mortality compared to fluconazole and itraconazole. Itraconazole solution and posaconazole were cost-effective options.

PP-AH-13

A Qualitative Study on the Experience with Oral Nutritional Supplements among Malnourished Elderly Patients in a Community Hospital in Singapore

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Background & Hypothesis:
Malnutrition among the elderly is associated with poorer functional outcomes. Oral nutritional supplements are commonly prescribed for elderly malnourished patients undergoing rehabilitation in the community hospital. As there is a lack of local research on their views of taking oral nutritional supplements, we sought to understand the patients' experience with oral nutritional supplements and their expectations after taking oral nutritional supplements.

Methods:
A qualitative research study using a descriptive exploratory method was conducted in a community hospital in Singapore in 2014. Five participants (aged 73 to 92 years) were recruited for the study and face-to-face in-depth interviews were conducted. Axial coding was done to form categories and these were grouped to form themes.

Results:
The analysis revealed 8 themes: feeling of goodness; relief of symptoms; taste; "you prescribe, I take"; "milk"; knowledge deficits; how oral nutritional supplements are being regarded; and cost of oral nutritional supplements.

Discussion & Conclusion:
This is the first qualitative study conducted locally. The results of this study have provided insights into the factors that clinicians should consider when prescribing oral nutritional supplements. During dietary counselling for patients, including the indication and benefits of oral nutritional supplements, and considering their taste preference will improve their acceptance of oral nutritional supplements.

PP-AH-14

Examining Differences in Quality of Life Domains among Substance Use Disorders

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Background & Hypothesis:
Recovery from addiction is measured by abstinence as well as improvement in global functioning, or quality of life. The PWI questionnaire, which measures quality of life, looks into one's perceived satisfaction with life across 7 domains. When administered before the start of treatment, it is a suitable tool to aid clinicians in tailoring treatment plans to target problem areas. Abusers of different substances have different needs. Hence, it is imperative to tease them apart, in order to address them appropriately.

Methods:
The PWI was administered at an outpatient treatment setting, and patients were asked to rate how satisfied they were on a scale of 0 to 10 on each domain. PWI scores of 3 main drug addiction types were then compared using 1-way ANOVA.

Results:
Amphetamine abusers (n = 39) reported significantly higher levels of satisfaction across 3 domains (standard of living, health and achievement in life) as compared with benzodiazepines (n = 46) and heroin abusers (n = 218) (P <0.01), and higher on 2 domains when only compared with heroin abusers (P <0.01). Heroin abusers were the least satisfied with their personal safety (P <0.001).

Discussion & Conclusion:
The problems faced by the differing drug abuse types may be manifested in different life domains. It may be helpful for clinicians to pay more attention to specific domains for different types of drug abusers, further improving their quality of care. Despite the illicit use of all 3 drugs, it is interesting that heroin abusers indicated significantly lower satisfaction on safety. The differing opinion on safety may also interfere with their motivation for treatment.

PP-AH-15

A Preliminary Investigation of Emotional Face Recognition in Individuals with Autism Spectrum Disorders (ASD) and Co-Occurring Attention Problems

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Background & Hypothesis:
Individuals with ASD and co-occurring conditions have marked difficulty reading and understanding emotional and social cues. Here, we compare emotion recognition abilities in children with ASD and those with ASD + ADHD to understand how these abilities relate to emotional and behavioural problems. Sharing a common ASD diagnosis, we hypothesise that there will be no group differences in the performance of the task. In an exploratory analysis, we aim to examine the association between emotion recognition abilities and behavioural profiles of these individuals.

Methods:
In our preliminary sample, 5 children with ASD only (M^{age} = 10.6, SD = 1.34, IQ ≥80) and 4 children with ASD + ADHD (M^{age} = 11.5, SD = 2.0, IQ ≥80) were recruited. Participants were instructed to identify fearful, sad, neutral and happy faces in a computerised task. Performance was based on accuracy and response time in identifying the correct emotion. Parents were asked to complete the Child Behavioral Checklist (CBCL).

Results:
Both groups performed between 74% to 93% accuracy in identifying the emotions. There were no group differences in the overall accuracy (t (7) = -0.23, *P* = 0.82) and response time (t (7) = 0.66, *P* = 0.53). A correlation analysis on the full sample revealed a negative association between response time in identifying fearful faces and some CBCL subscale scores (e.g. internalising, externalising and total problems), and a negative association between the accuracy in identifying happy faces and similar CBCL subscale scores (e.g. externalising and total problems).

Discussion & Conclusion:
Consistent with our hypothesis, these preliminary findings suggest that emotion recognition abilities are not affected by attention difficulties but are associated with other behavioural problems.

PP-AH-16

Stroke Upper Limb Outcomes after Robotics-assisted Therapy at a Rehabilitation Centre in Singapore

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Background & Hypothesis:
Recovery of the stroke upper limb is a major challenge in neurorehabilitation. This study aims to evaluate stroke patients who enrolled in an upper limb robotics-assisted rehabilitation programme that combines the use of the Armeo Spring (AS) with conventional occupational therapy (OT) at the Centre for Advanced Rehabilitation Therapeutics in Tan Tock Seng Hospital, Singapore.

Methods:
A retrospective study of patients enrolled from February 2012 to October 2013 was conducted. The programme constituted of 12 AS sessions followed by 6 conventional OT sessions. Each session was 45 minutes long. Outcome measures included the Fugl-Meyer Motor Assessment Upper Extremity (FMA-UE) test, Action Research Arm Test (ARAT), grip strength, modified Ashworth scale and pain at 4 time points: preprogramme, postrobotics, postprogramme, and 1-month postprogramme. Data was analysed with SPSS v.22.

Results:
Out of a total of 36 stroke patients, 27 (25 males, 15 females, mean age 52.9 years) who completed the programme were included for analysis. Mean FMA-UE was 18.07 (SD 11.95), 20.81 (SD 12.24), 22.89 (SD 12.44) and 26.25 (SD 12.69), and mean ARAT was 5.04 (SD 7.40), 5.85 (SD 7.61), 6.33 (SD 6.98) and 8.25 (SD 7.33) at the 4 time points respectively. These gains were statistically significant ($P < 0.05$) and there was no report of adverse events.

Discussion & Conclusion:
Conventional OT training in addition to upper limb robotics-assisted training was found to be safe and effective in reducing motor impairments after stroke.

PP-AH-17

Clinical Outcomes in Patients with Pneumonia Treated with Carbapenems – Direct Use vs Escalation Approach

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Background & Hypothesis:
Carbapenems are commonly prescribed for pneumonia treatment, either as an initial antibiotic (direct use group), or after initial antibiotics have failed (escalation group). Direct use approach potentially leads to overuse of carbapenems and selection for resistance. Hence, our study objective is to compare clinical outcomes between direct versus escalation approach for treating pneumonia inpatients.

Methods:
A retrospective review was conducted. One-hundred-and-seven patients who received imipenem or meropenem for pneumonia from November 2012 to June 2014 were included. We excluded children less than 18 years old, pregnant women, viral pneumonia, patients with other concomitant infections and those who received less than 72 hours of carbapenems. Patient demographics, CURB-65, Pitt bacteremia scores, antibiotic use, response to treatment and outcomes such as length of hospitalisation, subsequent ICU admission rates, pneumonia-related mortality and readmission due to pneumonia were charted.

Results:
Thirty-seven patients were in the direct use group and 70 in the escalation group. Patient demographics and disease severity were similar except higher Pitt bacteremia score in direct use group (1.33 vs 0.78, $P = 0.02$). Subsequent ICU admission due to pneumonia was similar [10/37 (27%) vs 10/70 (14.3%), $P = 0.108$], as was length of stay (9 vs 12 days, $P = 0.887$). In the escalation group, pneumonia-related mortality rate was higher [5/37(13.5%) vs 25/70 (35.7%), $P = 0.015$] but 30-day readmission due to pneumonia was lower [7/37 (18.9%) vs 4/70(5.7%), $P = 0.032$]. Median number of days to antibiotic switch was 5.4 (3 to 6.12).

Discussion & Conclusion:
This study underscores the association of timely initiation of appropriate antibiotics and clinical outcomes.

PP-AH-18

Evaluation and Correlation of Onsite Malaria PF/Pan Antigen Rapid Test Kit – For Use in TTSH's Communicable Disease Centre (CDC) Satellite Laboratory (SL) for MP Screening

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Background & Hypothesis:
Tan Tock Seng Hospital (TTSH) is the main centre for screening of communicable diseases such as Ebola and MERS-CoV infections. In order to minimise infectious exposure to both staff and the general public, a satellite laboratory (SL) was set up in the CDC. Rapid tests were evaluated and adapted at SL to replace conventional testing to achieve minimal specimen manipulation and swift resulting. A study was performed on the OnSite malaria test kit to evaluate its specificity and sensitivity. Correlation was done with PCR results.

Methods:
The OnSite Malaria PF/Pan Ag Rapid Test Kit (CTK Biotech) is a lateral flow chromatographic immunoassay for the detection and differentiation of *P. falciparum* and other *Plasmodium* species, namely *P. vivax*, *P. ovale* and *P. malariae*, by utilising monoclonal and polyclonal antibodies to pHRP-II, a *P. falciparum* specific antigen, and pLDH, an antigen found on all plasmodium species. A total of 15 samples, frozen and fresh, were tested with the MP Ag kit on site. The specificity and sensitivity were determined by using both fresh (n = 10) and frozen (n = 5) samples on the test kits.

Results:
All samples—specificity (90%), sensitivity (100%), PCR correlation (93%). Fresh samples only—specificity (100%), sensitivity (100%), PCR correlation (100%) .

Discussion & Conclusion:
The specificity, sensitivity and PCR correlation were satisfactory when using both fresh and frozen samples. The specificity and PCR correlation were better when only fresh samples were considered. In conclusion, in situations where microscopy is unavailable or not feasible to perform, the OnSite malaria test kit serves as a satisfactory alternative.

PP-AH-19

Complications and Their Risk Factors in Elderly Hip Fracture Patients in Singapore

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Background & Hypothesis:
Hip fractures are associated with significant mortality and morbidity. The elderly have multiple comorbidities and are at high risk of complications after their hip fracture. Objectives were to identify the prevalence of complications and risk factors associated in elderly hip fracture patients.

Methods:
A prospective cohort study of patients admitted with acute hip fracture from October 2011 to September 2012 was conducted. We excluded patients aged <60 years and pathological fractures. Complications were diagnosed clinically and recorded prospectively until the time of hospital discharge. Data on demographics, comorbidities, Abbreviated Mental Test (AMT) score, premorbid mobility and functional status, time to surgery, American Society of Anaesthesiologists (ASA) score complications and inpatient mortality were collected.

Results:
A total of 554 patients were studied. The mean age was 80.9 years (SD 8.6). The mean length of stay was 14.8 (SD 12.9). Complication rate was 10.3% (n = 57) with urinary tract infection 5.2% (n = 29) and pneumonia 3.2% (n = 18). Univariate analyses showed patients staying in nursing homes, delay in surgery (>48 hours) and Charlson comorbidity score significantly predicted inpatient complications ($P \leq 0.05$). Those requiring assistance in mobility before fracture had a tendency to develop complications ($P = 0.08$). Multiple logistic regression analysis showed that delay in surgery (>48 hours) increased the risk of developing complications (OR: 2.53, 95% CI, 1.22-5.23). Nursing home residents had a higher tendency of developing complications (OR: 3.28, 95% CI, 0.98-10.9).

Discussion & Conclusion:
Complications are common in hip fracture patients. Delay in surgery (>48 hours) is associated with a higher complication rate during hospitalisation. Operations should be performed on medically fit patients as early as possible.

PP-AH-20

Biosocial Risk Assessment of Patients on Structured Programme of Motivational Support

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Background & Hypothesis:
Since the commencement of a motivational programme last year, 14 out of 50 recruited patients have completed 12 follow-up sessions that were targeted in this programme, thus an initiatory result was obtained.

Methods:
Recruited patients undergo a prepost programme survey. The questionnaire asked if they had defaulted on treatment before, what their motivation to come back for treatment was and if the programme was beneficial. Patient's functional improvement (CGI and GAF), biosocial risk assessment and employment were recorded at each session.

Results:
Eight patients claimed they had not defaulted on any treatment while 6 claimed they had defaulted treatment. Using a 6-point Likert scale, 5 patients remained highly motivated (point 5 or 6) throughout the programme. Two patients felt the programme was beneficial and they were motivated to return for treatment with an initial point of 3 and end point of 6. The remaining 7 patients had an increase of 1 point when the programme ended. All patients found that incentives were liked best in the programme and 11 patients felt that personalised service was beneficial to them. For CGI scores, the majority of patients remained in the mildly ill categories. Patients claimed their daily lifestyle was manageable and medication was helpful. All patients remained suicide-free and were encouraged to maintain leisure activities. Patients who did not have a job were encouraged to get a job. In total, 1111 inpatient days were saved from preventing readmission.

Discussion & Conclusion:
With medication compliance, the incidence of illness relapse and hospital readmission will be reduced, thus the importance of this programme.

PP-AH-21

Nutritional Adequacy in Enterally Fed Critically Ill Patients: An Evaluation of Dietitian Blanket Referral Protocol

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Background & Hypothesis:
Underfeeding can lead to detrimental consequences in critically ill patients. This study aimed to evaluate if implementing a dietitian blanket referral protocol in intensive care units (ICU) of an adult hospital can achieve international recommendation for enteral nutrition (EN) delivery.

Methods:
This prospective cohort study was done on 94 patients on mechanical ventilation. APACHE II score, SOFA score and nutrition delivered during the first 7 days of ICU admission were collected. Patients were classified using the Nutrition Risk In The Critically Ill (NUTRIC) score. Outcome variables included mechanical ventilation days, ICU length of stay and mortality. Linear and logistic regressions were used to determine differences in outcomes using SPSS software.

Results:
EN was initiated 24 ± 28 hour of ICU admission and 89% of patients met the guideline of early EN initiation. Patients received an average of 814 ± 434 kcal and 39 ± 22 g protein per day, corresponding to $52 \pm 26\%$ energy and $53 \pm 29\%$ protein prescription respectively. Feed interruption throughout ICU stay was 47 ± 34 hour per patient. The top 2 reasons were fasting for intubation/extubation and high gastric residual volume, which contributed to 26% (12 ± 4 hour) and 16% (7 ± 18 hour) of total interruptions per patient, respectively. In patients with high NUTRIC score (n = 74), there were no differences in the outcome variables when adjusted for age, gender, APACHE II score, SOFA score and energy-protein adequacy.

Discussion & Conclusion:
A dietitian blanket referral protocol can ensure early EN initiation. This alone is insufficient to achieve adequacy of EN delivered. Feed interruption plays a significant role in affecting nutritional adequacy and should be addressed in the feeding protocol.

PP-AH-22

Examining Differences in Gambling Severity: Offline and Online Gamblers

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Background & Hypothesis:
The effects of online gambling versus offline gambling is a topic of interest for treatment providers worldwide, but little research has been conducted in Singapore. Our study explores differences in demographic profile and clinical presentation between gamblers who gamble online, offline or both.

Methods:
Participants comprised 418 outpatients (374 males, 44 females) fulfilling DSM-IV criteria for pathological gambling seeking treatment at the National Addictions Management Service (NAMS) between May 2013 to February 2015. Baseline interviews included demographic and clinical information collected from medical records, Gambling Symptom Assessment Scale (G-SAS), Personal Well-being Index (PWI), and other gambling severity measures.

Results:
Analysis was done for 3 groups: online gamblers (OGs) (15%), offline gamblers (61.1%) and combined offline and online gamblers (OFGs) (23.9%). Significant DSM-IV scores results were obtained for offline gamblers vs OFGs (7.02 vs 7.96). For gambling days, barely significant results were obtained for offline gamblers vs OGs (9.83 days vs 13.11 days) while significant results were obtained for offline vs OFGs (9.83 days vs 13.2 days). OGs had shorter latency between exposure and development of gambling problems compared to offline gamblers (4.21 yrs vs 10.88 yrs). The rest of the results were insignificant.

Discussion & Conclusion:
The results are mixed, but find no strong argument that online gambling results in greater gambling severity compared to offline gambling unless done in conjunction with offline gambling. An area to note is the shorter time it takes for OGs to develop problems compared to their counterparts. Early prevention and intervention for this group is crucial at the national level.

PP-AH-23

Establishment of Cell Models of Oxaliplatin Resistance in Colorectal Cancer

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Background & Hypothesis:
Patients undergoing chemotherapeutic treatment of metastatic colorectal cancer (CRC), generally based on the antimetabolite 5-fluorouracil combined with either the DNA-binding agent, oxaliplatin, or the topoisomerase I inhibitor, irinotecan, have improved prognosis. However, chemotherapeutic drug resistance hinders treatment efficiency. This study aims to further understand drug resistance mechanisms by generating and characterising CRC cell lines with acquired chemotherapeutic drug resistance.

Methods:
Oxaliplatin-resistant HCT116 and HT29 cell lines were generated by exposure to increasing oxaliplatin concentrations over 6 to 8 weeks. In-vitro drug sensitivity was determined using CellTitre96 Aqueous One Solution Cell Proliferation Assay. Cells were seeded in 96-well plates and a range of drug concentrations were added subsequently. After 48 hours, cells were incubated in medium containing Owen's reagent. Absorbance at 492 nm was measured and cell viability calculated in percentage against untreated cells. MicroRNA expression and DNA methylation profiles of resistant cells will be compared to those of cell origin using TaqMan OpenArray Human MicroRNA Panel and custom EpiTect Methyl PCR Array respectively.

Results:
Over 10 passages, drug concentrations for HCT116 were increased from 2 uM to 5 uM, and for HT29 from 5 uM to 8 uM. In HCT116, resistant and wild-type IC50 comparison was 7 uM and 5 uM correspondingly and in HT29 was 11 uM and 8 uM.

Discussion & Conclusion:
Further increasing drug concentrations will be necessary to obtain significant differences in drug sensitivity between resistant and wild-type cells. Study findings may provide insight on molecular mechanisms of chemoresistance, suggesting prognostic and predictive biomarkers of metastatic CRC chemoresistance and could be extended to other cell lines or drugs (e.g. irinotecan).

PP-AH-24

Relationship between Motives and Amount of Physical Activity (PA) among Youth

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Background & Hypothesis:
According to Khor (2014), 1.7 million Singaporeans are at risk of obesity-related diseases. Physical inactivity is contributable to the cause of obesity (WHO, 2002). However, the amount of physical activity is declining due to different individual motivations (Battistelli, Montani, Guicciardi, & Bertinato, 2014). Thus, this study aims to investigate the relationship between motives and PA.

Methods:
Three-hundred-and-nine students involved in different co-curricular activities in Ngee Ann Polytechnic had been recruited to complete the International Physical Activity Questionnaire (IPAQ) and Physical Activity and Leisure Motivation Scale (PALMS). The IPAQ measures amount of PA in the past 7 days, whereas PALMS measures the motives for participating in PA.

Results:
The amount of time doing vigorous PA was significantly correlated with the PALMS subscales of mastery, enjoyment, psychological condition, competition/ego and physical condition, with r ranging from 0.14 to 0.30 at $P < 0.05$. The amount of time doing moderate PA was significantly correlated with mastery, enjoyment, physical condition and affiliation, with r ranging from 0.12 to 0.13 at $P < 0.05$. Amount of time for walking was significantly correlated with appearance ($r = 0.11$, $P = 0.046$) and others' expectation ($r = 0.16$, $P = 0.004$).

Discussion & Conclusion:
Similar motives (mastery, enjoyment, and physical condition) were found for doing vigorous PA and moderate PA. We propose that these factors should be enhanced through the design and education of PA, so as to increase PA amount and reduce risk of obesity.

PP-AH-25

Maintaining Psychiatric Outpatient Attendance with Case Management Intervention at Community Wellness Clinic – Queenstown

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Background & Hypothesis:
Patients who miss their psychiatric appointments are at risk of relapse and hospitalisation. Various studies have found reminder letters and telephone prompts to be effective in reducing outpatient non-attendance rate in patients with psychiatric illness.

Methods:
Those who missed their appointment were referred. The case manager worked closely with patients and family using simple techniques that have been useful to improve outpatient attendance. The techniques were mainly psychoeducation, motivational interviewing, telephonic support and reminder letters, or activating short message services. Retrospective data was collected for 1 year from January 2014 to December 2014 on all referrals received.

Results:
A total of 316 patients who missed their appointment had been referred. Of these, 156 were female patients and 160 males. Majority of them were aged between 40 to 60 years. Main diagnosis was schizophrenia. Clinical outcomes showed a significant improvement in attendance rate of 86% following interventions; only 5% required inpatient admission.

Discussion & Conclusion:
Engaging this client group who are at the most risk of complete disengagement and at high risk of relapse has its own challenges. However, on a positive note regular monitoring of outpatient non-attenders by a case manager has shown to significantly improve adherence to outpatient attendance and medication compliance.

PP-AH-26

Preparing the Advanced Chronic Kidney Disease Patients for Renal Replacement Therapy Takes Time

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Background & Hypothesis:
Advanced chronic kidney disease (CKD) patients require optimal counselling for renal replacement therapy (RRT) preparation. Our objectives were to identify the impact of nephrology referral, the acceptance for RRT and access planning.

Methods:
A single centre, retrospective, study of patients started haemodialysis from January 2012 to December 2014. Demographics, comorbidity and RRT preparation were obtained. The outcomes were index hospitalisation duration and short-term survival.

Results:
There were 217 patients who started haemodialysis. The mean age was 59.0 ± 11.6 years, 58% were males and 58.3% were Chinese patients. Diabetic patients consisted 79.6% and mean Charlson Comorbidity Index was 4.3 ± 1.4. Prior nephrology referral was made in 75% of the patients with median referring eGFR was 11 mL/min (IQR: 5, 18). Significant differences in the group known to nephrologists compared to new patients where they were older (60.0 ± 11.6 vs 55.9 ± 11.3 years), had higher median eGFR upon referral (15.0 vs 4.0 mL/min) and more diabetic patients (84.5 vs 65.5%). They had early access created (30.4% vs 3.6%), the median for index hospitalisation was shorter (8 vs 12 days) but not short-term survival. Among the patients known to the nephrologist, 36% were indecisive due to denial, financial and fear. The median duration from nephrology consult to dialysis initiation was 21 months and preparation for access took 14 months.

Discussion & Conclusion:
Timely referral of suitable patients with advanced CKD for RRT counselling is important to reduce hospitalisation stay. The preparation process takes more than 12 months and challenges remain for the patients to reach definitive plan.

PP-AH-27

Baseline Quantitative Electroencephalogram (QEEG) Wave Patterns between Children with Autism Spectrum Disorders and Controls

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Background & Hypothesis:
Children with autism spectrum disorder (ASD) have been reported to show atypical patterns of resting QEEG levels. Although studies have consistently found a reduction in alpha wave, findings regarding other brainwaves are mixed. The study aims to characterise and compare the resting baselines patterns of children with ASD to that of neurotypical controls in a local sample at locations corresponding to sensory and motor cortical areas. It is hypothesised that the 2 groups differ in QEEG profiles across baseline resting conditions.

Methods:
The study employs a between-group design. Twenty children diagnosed with an ASD and 20 neurotypical controls are recruited. Alpha, delta, theta and gamma waves were measured via electrodes placed on the scalps of participants at the C3 (left) and C4 (right) temporal regions. Participants were instructed to relax with their eyes opened first and subsequently with their eyes closed. Measurements were obtained for 2 minutes for both tasks.

Results:
Independent sample t-tests reveal significant differences in the wave patterns between children with ASD and the neurotypical controls. Children with ASD had significantly lower alpha and theta wave activity. They also displayed significantly higher delta and gamma wave activity compared to the neurotypical controls.

Discussion & Conclusion:
The study finding of reduction in alpha wave activity of children with ASD is consistent with the literature. Patterns of group differences for delta, theta and gamma wave baseline levels are less consistent across conditions and electrodes. Reduced alpha wave activity in ASD suggests possible difficulties in imitative abilities.

PP-AH-28

An Evaluation of a Pilot Structured Psychoeducation Module for Patients with Bipolar Disorder

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Background & Hypothesis:
Promoting processes that can aid patients' recovery during hospitalisation is always a primary concern for healthcare professionals. This paper aims to establish whether providing a psychoeducation in the mood disorder ward will have a positive outcome on the male bipolar patients.

Methods:
Patients admitted from February 2015 to May 2015 provided with 2 separate face-to-face psychoeducation sessions, "Introduction and causes of bipolar disorder" and "Understanding the importance of medication adherence". The 7-item Hamilton Rating Scale for Depression (HAMD-7) and 11-item Young Mania Rating Scale (YRMS) are measured by the case managers, and readmission rate was analysed using Microsoft Excel.

Results:
Twelve male patients were analysed, 6 Chinese, 1 Malay and 5 Indians, and they were aged 22 to 70 years old. Their marital status: 3 were married and 9 were single. HAM-D 7 scale showed that 5 patients had displayed non/partial response (≥ 4) and 7 displayed full remission (≤ 3) on admission. Out of the 5 patients who displayed non/partial response, 4 of them were in full remission upon discharge. YMRS scale displayed 8 patients in non-/partial response (≥ 13) and 4 patients in full remission (≤ 12) on admission. Out of the 8 patients in non/partial response, 7 of them were in full remission upon discharge. Only 1 patient was readmitted within less than 30 days of discharge. Only 1 patient was readmitted within <30 days of discharge.

Discussion & Conclusion:
Psychoeducation is effective in having a positive outcome on male patients with bipolar disorder. Future psychoeducation can also be extended to female bipolar patients.

PP-AH-29

Causes of Significant Thrombocytosis in an Acute Care Hospital

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Background & Hypothesis:
Thrombocytosis is not uncommon among patients attending an acute care hospital. This could be a reactive process secondary to an underlying clinical disorder or part of the manifestation of a myeloproliferative neoplasm. It is important to identify the cause since the management is different depending on the cause. The aim of this study is to identify the distribution of the underlying causes for significant thrombocytosis in an acute care hospital setting.

Methods:
We collated 304 cases from May 2014 till May 2015 with significant thrombocytosis (>800 x 109/L) and investigated the causes of thrombocytosis in Tan Tock Seng Hospital. Various data and other laboratory indices, such as red cell counts, white cell counts, haemoglobin levels, ESR, CRP, sodium, potassium, urea, creatinine, calcium, albumin, ferritin, AFP, CEA, bcr-abl mutation studies, *JAK2* mutation studies, cytogenetics and bone marrow reports were used to identify the probable cause.

Results:
A total of 23.7% of the patients were diagnosed with myeloproliferative neoplasm as a cause of thrombocytosis, of which 65.3% were essential thrombocytosis, 23.6% polycythemia vera, 9.7% chronic myeloid leukaemia, and 1.4% were myelofibrosis. A total of 76.3% of the patients have thrombocytosis secondary to other causes. Among these patients, 35.3% were treated for infection, 41% were treated for inflammation and 23.7% were treated for other non-haematological malignancies.

Discussion & Conclusion:
Thrombocytosis secondary to infections, inflammations and non-haematological malignancies appears to be the most common cause of significant thrombocytosis in an acute care hospital setting.

PP-AH-30

To Reduce Hospital-Acquired Urinary Tract Infection Rates in Elderly Hip Fracture Patients from 9% to 5% in Nine Months

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Background & Hypothesis:
This study aimed to reduce hospital-acquired urinary tract infection (HAUTI) rates in elderly hip fracture patients from 9% to 5% in 9 months.

Methods:
Urinary tract infection remains a major complication in elderly hip fracture patients. In January 2014 to March 2014, 9% of hip fracture patients suffered HAUTI (defined as fever 38° urinary symptoms with a positive urine culture). We prospectively collected data on HAUTI rates in elderly hip fracture patients admitted to the orthopaedic wards (1 June 2014 to 28 February 2015). We excluded those with non-fragility fractures. The Clinical Practice Improvement Programme (CPIP) methodology was used. A cause and effect diagram was done to analyse the problem and 3 main root causes were identified in the Pareto chart: 1) perineal hygiene not done properly; 2) no regular potting done; and 3) pain experienced by hip fracture patients which made it difficult for them to pass urine. The following interventions were carried out: 1) a standardised perineal hygiene protocol was established for ward nurses; 2) sharing of HAUTI data to ward at regular intervals to allow staff to be aware of the problem and stress the importance of potting; and 3) fascia iliac block for hip fracture patients to minimise pain. We performed the Plan-Do-Study-Act (PDSA) method of analysis for each intervention for our project.

Results:
A total of 336 patients were included. The mean age was 80 years, of whom 71% (n = 239) were women and 36% (n = 122) were catheterised due to acute retention of urine. After incorporating the 3 interventions, the HAUTI rates for hip fracture patients have been reduced from 9% to 4%.

Discussion & Conclusion:
The CPIP methodology has been useful in reducing HAUTI in hip fracture patient by incorporating standardised perineal hygiene protocol, increasing awareness of HAUTI to ward nurses and optimising pain management in hip fracture patients.

PP-AH-31

Smoking Cessation and Counselling: Knowledge and Views of Singapore Physiotherapists

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Background & Hypothesis:
Healthcare professionals, especially physiotherapists are placed in a very good position to administer smoking cessation interventions. However, little is known regarding the knowledge and views of physiotherapists with regards to smoking cessation. The aim of this study is to determine the knowledge of physiotherapists and their views about providing smoking cessation interventions, as well as their self-efficacy in providing smoking cessation advice.

Methods:
Current practising physiotherapists in Singapore were surveyed with an online questionnaire. This study was a cross-sectional study.

Results:
A total of 169 survey responses were returned. The mean age and years of clinical experiences of the respondents were 29.2 (SD = 5.78) years and 6.52 (SD = 5.25) years respectively. Eighty-four percent of the respondents were women. Physiotherapists in Singapore were largely aware of the negative impacts of smoking on health. Although more than 70% of the physiotherapists agreed or strongly agreed that physiotherapists should routinely asked their patients/clients about their smoking habits, this agreement decreased to 66.3% when they were asked if they intended to help their patients/clients who smoke to stop smoking. Most physiotherapists reported that they were not prepared to provide counselling. Lack of time and resources were reported to be main barriers to counselling patients/clients to quit smoking.

Discussion & Conclusion:
Most physiotherapists expressed views that smoking cessation counselling is a clinical responsibility and supported greater involvement of physiotherapists in helping people who smoke quit. However, there was some discontinuity between these views and physiotherapists' interest in receiving training on smoking cessation counselling.

PP-AH-32

Employment and Well-being among the Singapore Elderly

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Background & Hypothesis:
It has been hypothesised that working beyond retirement age may have a protective effect on various aspects of well-being in the elderly. This paper aims to examine the relationship between employment status of elderly Singaporeans and indicators of well-being.

Methods:
Data was utilised from the Well-Being of the Singapore Elderly (WiSE) study, a cross-sectional epidemiological study examining the health status of the elderly in Singapore. Data relating to sociodemographics, social networks, medical history, physical activity, cognitive function and disability were collected from 2534 participants aged 60 years and above. Participants included paid workers (part time or full time, n = 688), the unemployed (n = 32), homemakers (n = 808) and retirees (n = 1006). The data was analysed using multiple logistic regression.

Results:
The likelihood of being a paid worker decreased with age and was higher among males. Paid workers had significantly higher levels of physical activity, more extensive social networks, better cognitive function, less disability and lower risk of dementia compared to retirees and homemakers. Paid workers had a significantly lower chronic disease burden than retirees, and rated their health to be better than retirees and the unemployed. Compared to paid workers, the unemployed and retirees were also significantly less likely to have regular contact with children and relatives.

Discussion & Conclusion:
These findings show that meaningful employment is associated with better psychological and physiological well-being among the elderly, highlighting the significance of studying likely protective effects of employment and creating employment opportunities for elderly Singaporeans.

PP-AH-33

Internet Addiction and its Associations with Physical and Psychosocial Well-being among Adolescents in Singapore

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Background & Hypothesis:
There is an increasing trend of Internet addiction among adolescent population due to rapid advancement and easy accessibility of the Internet. Previous studies have demonstrated the associations between Internet addiction and mental health outcomes, such as anxiety, depression, hyperactivity and conduct problems. However, relatively less research has investigated its association with psychosomatic symptoms (e.g. recurring headaches and sleep problems). The current study aimed to examine the prevalence rate of Internet addiction among adolescents in Singapore. Its associations with adolescents' physical and psychosocial well-being were also explored in the local context.

Methods:
A total of 3319 adolescents aged 12 to 17 years (M = 14.4) were recruited from secondary schools, junior colleges and a polytechnic in Singapore. Participants completed the Internet Addiction Test (IAT) and Strengths and Difficulties Questionnaire (SDQ). They also reported their frequency of having recurring headaches, abdominal pain, sleep problems and falling sick.

Results:
Based on the IAT's classification method, 2105 (63.7%) participants were average Internet users, 1139 (34.4%) reported occasional problems, and 63 (1.9%) had significant problems with Internet use. Logistic regression analyses showed that those with occasional or significant problems with Internet use were more likely to be associated with having emotional, conduct, hyperactivity/inattention and peer problems than the average Internet users. Significant associations were also found between Internet addiction and frequent psychosomatic symptoms.

Discussion & Conclusion:
Findings suggest that Internet addiction is an emerging phenomenon among adolescents in Singapore. Its associations with negative outcomes in adolescents' physical and psychosocial well-being highlight the need for prevention and intervention strategies.

PP-AH-34

Improving Takeup Rate for Convidose^{TM} to Improve Medication Adherence in the Outpatient Setting

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Background & Hypothesis:
NHG Polyclinic patients on chronic care follow-up often require complex medication regimens, some involving 15 to 20 tablets taken daily. Poor medication adherence reduces the benefits of pharmacotherapies. However, usage of dosage administration aids has shown improved adherence, especially in the elderly after ConviDose^{TM} was introduced to NHGP patients in 2012 to help improve medication adherence. Takeup and retention rates were unsatisfactory although 100% of patients recruited found that Convidose^{TM} helped them manage their medications better. Other issues also prevented the spread of the service to patients who could benefit from Convidose^{TM}.

Methods:
We utilised quality improvement tools to improve the takeup rate. Seventeen root causes were identified and interventions were tested through the Plan-Do-Study-Act (PDSA) cycles over a period of 6 months. Some targeted areas include the recruitment, packing and dispensing processes, marketing mechanics, medication packaging, education materials and IT system. A survey was conducted upon recruitment and during the follow-up visit to gauge benefits of Convidose^{TM} and patient satisfaction.

Results:
After 6 months, subscription rates increased by 400% with retention rates of 89%, bringing the number of patients on Convidose^{TM} to 121. Survey results showed a reduction of missed doses by 50%, reduction of patient confusion by 77.1% and reduction of difficulties in handling medicines by 59.3%. Patients were also more satisfied with the service, with an overall satisfaction index of 92%, up from 71% previously.

Discussion & Conclusion:
Implementation of a service, although proven to benefit users, requires frequent monitoring and timely reviews. Feedback from the users is invaluable to the continuous journey of improvement.

PP-AH-35

Psychological Adjustment and Well-being of Siblings of Individuals with Autism Spectrum Disorder: A Systematic Review

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Background & Hypothesis:
Siblings of individuals with autism spectrum disorder (SibsASD) have been perceived to present with a heightened risk of behavioural and emotional problems. The current review summarises current findings on siblings' well-being in the literature and discusses key observations and areas of improvement.

Methods:
Literature searches were conducted on 3 scientific databases MEDLINE, PsycINFO and ERIC. Search terms include: autis*, Pervasive Developmental Disorder-Not Otherwise Specified (PDD-NOS), Asperger, AND sibling AND quality of life, well-being, psychological adjustment, and psychological outcomes. The initial search yielded a total of 74 peer reviewed publications. A total of 24 articles were identified via a screen of titles and abstracts. Only 15 articles met the eligibility criteria for inclusion: 1) focus on outcomes of SibsASD, and 2) includes at least 1 psychological adjustment measure.

Results:
Only 4 out of the 15 studies reported significant reduction in the psychological adjustment and well-being of SibsASD, compared with siblings of typically developing children (n = 6), siblings of children with other developmental disorders (n = 7) and normative data (n = 2). A wide range of psychological measures were used in the studies.

Discussion & Conclusion:
There is a paucity of research on this topic. Factors that could impact psychological outcomes of SibsASD were largely unknown. The wide range of measures utilised possibly contributed to a lack of consistent findings. Future research could explore a multidimensional approach in assessing the psychological adjustment of SibsASD. Longitudinal studies should also be conducted to investigate long-term impacts, challenges and coping strategies of these individuals over their lifespan.

PP-AH-36

Factors Influencing the Use of Services for Children with Autism Spectrum Disorder: A Preliminary Finding

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Background & Hypothesis:
Autism spectrum disorder (ASD) is a complex developmental disorder requiring extensive treatment and support. We hypothesised that the variety of therapies used by children with ASD was associated with parental occupation, family size, age and diagnosis of the child, and the number of paramedical services (e.g. academic intervention, counselling) accessed.

Methods:
A sample of 136 participants' data was extracted from a previous study examining the accessibility of healthcare services for children with ASD in an outpatient psychiatric clinic in Singapore. Data was analysed using Poisson regression.

Results:
The number of children in the family, number of paramedical services used, and child's age significantly predicted the variety of services used. The individual with ASD is 0.821 (95% CI, 0.718-0.939) times more likely to use 1 more type of therapy for each additional child in the family, and 1.168 (95% CI, 1.091-1.251) times more likely to use 1 more type of therapy for each additional paramedical services received. For the younger the child with ASD, he is 0.995 (95% CI, 0.992-0.998) times more likely to use more types of therapies.

Discussion & Conclusion:
Our findings suggest that parents with younger children and who seek out more support for their child with ASD are more likely to try different kinds of therapy approaches. The utilisation of services also appears to be related to the amount of resources available to the family. Future research could focus on factors that influence parental decision on therapy choices for their child.

PP-AH-37

Efficacy of Neurofeedback as a Treatment for ASD: A Systematic Review

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Background & Hypothesis:
Neurofeedback (NFB) is a potential treatment method that is increasingly being used and studied in neuro-related disorders. A systematic review is done to examine the evidence of its efficacy for autism spectrum disorder (ASD).

Methods:
Electronic literature searches on PsycINFO, PubMed, and SCOPUS databases using search terms: "Neurofeedback" OR "Biofeedback" OR "Neurotherapy" AND "Autism spectrum disorder" OR "Autistic" OR "Asperger's" were conducted. References of identified articles were manually screened for relevant articles. Ninety-two unique results were generated between 2005 and 2014, of which 30 were relevant to NFB based on a screen of abstracts. Thirteen articles met the inclusion criteria: 1) experimental and, 2) involves sample population of individuals with ASD, and were included in this review.

Results:
Three studies utilised a typically developing control group, 6 used waitlist controls and 3 studies used a single treatment group design. Of the 13 studies, 12 reported statistically significant positive results such as improvements in social behaviour, electrophysiological changes and affective response in children with ASD. The remaining article attained non-significant reductions of symptoms of ASD by means of EEG biofeedback. There were 2 studies that investigated longer term effects and reported sustained improvements at 6 months and at 12 months, respectively.

Discussion & Conclusion:
NFB appears to be a promising form of treatment. Currently, there are variances in the administration of NFB and the objective markers to measure outcomes. Future research could investigate the intensity and frequency of treatment, programme content, and the application of NFB with reference to the targeted symptoms of ASD.

PP-AH-38

Risk Factors for Non-Response to Oral Metronidazole in the Treatment of Clostridium Difficile in a Tertiary Hospital in Singapore

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Background & Hypothesis:
Oral metronidazole is the recommended therapy for mild to moderate Clostridium difficile infection (CDI) and oral vancomycin for severe CDI. We aimed to identify risk factors associated with treatment failure with oral metronidazole in our hospital.

Methods:
This is a retrospective cohort study. Unique CDI episodes from January 2012 to December 2012 treated with only oral metronidazole were included in the study. Non-responders were defined as: 1) persistent diarrhea at day 6; 2) recurrent diarrhea within 2 to 8 weeks after end of treatment; 3) development of complications; and 4) 30-day mortality.

Results:
One-hundred-and-fifty-three episodes were included in the study. There were 78 (51%) episodes that responded to oral metronidazole. Baselines characteristics between the 2 groups were similar. Univariate variables associated with non-response were use of nasogastric tube (OR: 2.37, 95% CI, 1.05-5.34, P <0.05) and severe CDI as defined by the Society for Healthcare Epidemiology of America and the Infectious Diseases Society of America 2010 (SHEA/IDSA) guidelines (OR: 3.10, 95% CI, 1.58-6.10, P <0.01). Charlson's score was negatively associated with non-response (OR: 0.88, 95% CI, 0.79-0.99, P <0.05). After adjustment for covariates, only severe CDI was independently associated with non-response to oral metronidazole treatment (OR: 2.75, 95% CI, 1.32-5.74, P <0.01)]. Subgroup analysis showed that patients with severe CDI had more persistent diarrhea at day 6 (55.2% vs 30.5%, P <0.01).

Discussion & Conclusion:
Severe CDI as defined by SHEA/IDSA guidelines determined non-response to oral metronidazole. Patients in our hospital should receive oral vancomycin when severe CDI was clinically diagnosed.

PP-AH-39

Does a Total Knee Replacement (TKR) Preoperation Programme Help to Improve Patient's Length of Stay (LOS) and Functional Outcomes?

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Background & Hypothesis:
The current postoperation LOS for TKR patients in Tan Tock Seng Hospital (TTSH) is 6 days, with about 40% of these patients staying beyond 6 days. There is currently no standardised TKR preoperation education for the patients to educate and prepare them and their caregivers before their operation. The aim of the study is to evaluate the effectiveness of a transdisciplinary TKR preoperation group education.

Methods:
A transdisciplinary TKR preoperation group education programme was developed and conducted in small groups by an interprofessional medical team. The programme equips the patients and caregivers with the skills and knowledge required for recovery which includes: 1) essential exercises; 2) tips on home preparation; 4) expectations and milestones postoperation; and 5) discharge planning. Thirty TKR patients were referred to the programme prior to TKR.

Results:
A total of 36% more patients who underwent the TKR preoperation programme were discharged within LOS. All patients perceived that they had enough knowledge of surgery and recovery and 67% more patients reported that they felt confident about the surgery and recovery post-TKR preoperation programme. Compared to patients who did not attend the TKR preoperation programmed, 10% more patients were able to climb the stairs with supervision or independent on discharge. Twenty percent more patients achieved 0°-90° knee range of motion on discharge.

Discussion & Conclusion:
TKR preoperation programme seems to have some positive effects on the functional outcomes and subjective perceived knowledge and confidence of the surgery and recovery. We suggest rolling out the TKR preoperation programme to a larger group of patients to evaluate its effectiveness.

PP-AH-40

A Physiotherapy Clinical Pathway for the Management of Chronic Neck Pain

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Background & Hypothesis:
Neck pain is increasingly recognised as one of the most common causes for disability. The Global Burden of Disease Study 2010 ranked it fourth in causing "years of life lived with disability". Studies showed that 50% to 85% of people with neck pain reported persistent symptoms after 1 year and it can incur significant healthcare costs. Despite many studies, there are no consolidated clinical pathways for the treatment of neck pain and evidence of its clinical application and efficacy.

Methods:
The preparation of this clinical pathway was guided by recommendations from the Scottish Intercollegiate Guidelines Network. A computerised literature search and review was conducted on the MEDLINE, EMBASE, PEDro, Scopus, and Cochrane Central Register of Controlled Trials, up until March 2013. Inclusion criteria included randomised controlled trials, study subjects suffering from more than 3 months of neck symptoms.

Results:
A total of 31 out of 421 RCTs were included. There were strong evidences for exercises to be more beneficial than control group for pain relief and reduction of disability, and combined manual therapy and exercise to be more effective than manual therapy alone. Transcutaneous electrical nerve stimulation or low-level laser therapy could be possible adjuncts to treatment. There was weak evidence supporting a cognitive-behavioural-based programme with individualised exercises. No recommendation for optimal dosage of specific treatment modality could be made.

Discussion & Conclusion:
This review recommends that exercises should be incorporated as part of the treatment for patients with chronic neck pain. As there was no specific intervention that was superior to another, choice of treatment should be weighed against potential effects and patient responses.

PP-AH-41

A 12-Month Review of CM Interventions in Managing Patients who Defaulted Appointments

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Background & Hypothesis:
Since 2003, case management service in IMH has pioneered several strategies to improve patients' continuous engagement in treatment and reduction in relapses. This has led to an improvement in attendance rate after discharge. This paper will demonstrate the success of this initiative by showing the effectiveness of the intervention in enhancing the rate of patients' compliance to follow-up, treatment and reduction in the default rates in the outpatient setting.

Methods:
A 12-month retrospective review of patients who defaulted their outpatient appointment was done from February 2014 to February 2015. List of defaulters were obtained from case trackers on a daily basis. Case management strategies were taken such as building therapeutic relationships, identifying and addressing barriers in assessing services early, psychoeducating patients and family on mental illness and medication adherence, and regular appointment reminder phone calls to patients postdischarge. The results were analysed using Microsoft Excel programme.

Results:
Out of all the 1858 patients who were referred and contactable, 75% of them eventually returned to specialist outpatient clinics for their review, with an additional 4% requiring admission as a result of relapse due to non-compliance. Five percent more were managed by other specialised programmes within IMH.

Discussion & Conclusion:
The outcome of this review is encouraging, and it shows that the above-mentioned case management strategies in default tracking has an important part to play in reduction of default rate and relapse prevention.

PP-AH-42

Child Appraisals of Interparental Conflict and Parent-Child Conflict to Antisocial Behaviours in Singapore Children with Behavioural Issues

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Background & Hypothesis:
Interparental conflict and parent-child conflict has been consistently associated with childhood antisocial behaviours in research. A child's perspective of the family dynamics may be more relevant to their well-being than parents' perspective. Little research has been done with a Singapore clinical sample. Hence, this study examined the relationship of child-reported interparental and parent-child conflicts on antisocial behaviours in Singaporean children with behavioural problems. We hypothesised that positive correlations will be found.

Methods:
A total of 282 participants with attention deficit hyperactivity disorder, oppositional defiant disorder and conduct disorder were recruited from a Singapore child psychiatric clinic as part of a larger randomised controlled trial. Children were asked to complete the Conflicts Tactic Scale to assess the frequency of psychological and physical aggression between their parents and from parents towards them when conflicts occur. They also completed the Antisocial Process Screening Device which assessed antisocial processes on 3 subscales: callous/unemotional, narcissim and impulsivity.

Results:
Correlational analyses showed that interparental psychological aggression, mild and severe physical aggression were significantly and positively correlated to narcissism and impulsivity. Parent-child psychological aggression, mild and severe physical aggression were also found to be significantly and positively associated with narcissism and impulsivity. No such relationship was found on the callous/unemotional subscale.

Discussion & Conclusion:
Results reiterate the influence of family conflict on child's antisocial behaviours. Both interparental and parent-child relationship must not be ignored. These results emphasise the importance of parent training and family/marital work in the future treatment of children with antisocial behavioural issues in Singapore.

PP-AH-43

Evaluation of MetLac 12 Panel on Piccolo Express Analyser for Suspected Ebola Patients

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Background & Hypothesis:
In preparation for handling possible Ebola patients, Tan Tock Seng Hospital (TTSH) established a satellite laboratory at the Communicable Disease Centre 2 (CDC2). The Piccolo Xpress analyser (Abaxis USA) was selected to perform the chemistry profiles. We evaluated its performance in this study. Acceptable sample types include whole blood (lithium heparin) or plasma (lithium heparin).

Methods:
Twelve analytes, sodium, potassium, chloride, bicarbonate, BUN, creatinine, calcium, magnesium, phosphate, glucose, albumin and lactate were measured simultaneously with 100 uL of plasma (lithium heparin) using a MetLac 12 Reagent disk. Two levels of manufacturer-supplied QC materials were analysed for 20 days to assess precision. Linearity was assessed using commercially available verification materials. Results from 20 patients were compared between the Piccolo Xpress analyser and the Beckman Coulter DXC 800.

Results:
Between-day precision was <5% for both levels except bicarbonate, low and high level QC (CV 8% at 11 mmol/L, 10% at 26 mmol/L) and creatinine low level QC (10% at 63 umol/L). All assays demonstrated acceptable linearity. Comparison between Piccolo and Beckman showed satisfactory agreement for all assays.

Discussion & Conclusion:
The Piccolo analyser showed acceptable performance with respect to precision, linearity and comparison with the central laboratory analyser. Given its portability, ease of operation and rapid analysis time, the Piccolo analyser is suitable for use to serve the needs of our hospital in evaluating suspected Ebola patients.

PP-AH-44

Performance of Ark Methotrexate Assay on Beckman Coulter DXC 800

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Background & Hypothesis:
Methotrexate (MTX) is an antimetabolite which interferes with folic acid production and cessation of DNA synthesis. High dose MTX is used in the treatment of certain malignancies such as acute lymphoblastic leukaemia and non-Hodgkin lymphoma. Low dose MTX is commonly used in the treatment of psoriasis and rheumatoid arthritis. Patients who are undergoing high dose MTX therapy have to be monitored closely to prevent potentially serious MTX toxicity.

Methods:
The Ark Methotrexate assay on Beckman Coulter DXC 800 utilises a homogenous enzyme immunoassay technique. Precision was assessed at 3 levels for 20 days using manufacturer-supplied QC materials. Analytical sensitivity was determined by running saline in 20 replicates. Linearity was assessed using dilutions of CAP Survey material in saline. Results from 3 patients were compared against Siemen Centaur.

Results:
Day-to-day CV was 13.1% (MTX 0.09 umol/L), 3.7% (0.41 umol/L) and 9.4% (0.71 umol/L). Analytical sensitivity was <0.01 umol/L (claim: 0.01). The assay was linear to at least 1.55 umol/L (claim: 1.30). There was good agreement between methods at low concentrations up to 0.16 umol/L. A single high sample of 55.5 umol/L with DXC 800 gave a result of 47.0 umol/L with Centaur.

Discussion & Conclusion:
The Ark Methotrexate assay on Beckman Coulter DXC 800 shows good performance characteristics with respect to precision, sensitivity and linearity. The assay demonstrated its reliability to measure MTX concentrations at very low levels. This is of clinical importance in achieving non-toxic levels in patients who are undergoing management of MTX toxicity by leucovorin rescue.

PP-AH-45

Evaluation of Troponin I (AccuTnI+3) Measurement on Beckman Coulter Unicel DxI 800 Immunoassay Analyser

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Background & Hypothesis:
Troponin I measurement is used for the diagnosis of myocardial infarction (MI). We describe the analytical performance of the new troponin I (AccuTnI+3) assay on the Beckman Coulter Unicel DxI 800 analyser.

Methods:
Troponin I (AccuTnI+3) was measured using a 2-site immunoenzymatic method. Three levels of manufacturer-supplied QC materials were analysed for 20 days to assess precision. Analytical sensitivity was determined using Limit of Blank Module of EP Evaluator. Linearity was assessed using dilutions of calibrator material in zero calibrator. Results from 100 patients were compared between the current (enhanced) and the new (AccuTnI+3) troponin I assays. A total of 249 samples (124 males and 125 females) were taken from assumed healthy individuals to establish the reference interval (RI).

Results:
Day-to-day CV ranged from 2.2% to 6.6%. Analytical sensitivity was <0.01 ug/L (claim: 0.01). The assay was linear to at least 71 ug/L (claim: 76). AccuTnI+3 readings were generally lower across the entire range (Deming regression: Accu TnI+3 = 0.72*Enhanced - 0.02). The 99% URL for males and females (combined) was 0.04 ug/L (manufacturer's claim: 0.04). The female 98% URL was lower than the male URL (female: 0.02, male: 0.04 ug/L). (Insufficient data for 99% URL calculation).

Discussion & Conclusion:
The troponin I (AccuTnI+3) measurement on the Beckman Coulter Unicel DxI 800 shows good precision, sensitivity and linearity with a wide measuring range.

PP-AH-46

Distribution of the Causes of Normochromic Normocytic Anaemias in an Acute Care Hospital Setting

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Background & Hypothesis:
Anaemia is one of the common clinical conditions encountered in primary care. Anaemia is usually classified as microcytic, normocytic and macrocytic anaemias. Normocytic normochromic anaemia (NCNC) is usually secondary to various underlying clinical disorders and thus poses a challenge in the diagnosis. The aim of this study is to identify the distribution of the probable causes of NCNC in an acute care hospital.

Methods:
Laboratory data from 300 patients with NCNC anaemia (Hb <9.0 and MCV between 85 and 99) during January 2015 were analysed. Patients with anaemia secondary to acute blood loss or are heavily transfused were excluded from the study. Patients' medical history and relevant laboratory tests were used by clinicians to investigate the probable causes of anaemia.

Results:
Of the 300 patients studied, 81% of the NCNC anaemia is probably secondary to chronic inflammatory disorders (anaemia of chronic disease). This includes diabetes mellitus with nephropathy, systemic lupus erythromatosus, chronic kidney disease, cancers of various origins and HIV infections. Bone marrow disorders, namely, myelodysplastic syndrome, myeloproliferative disorders, multiple myeloma, leukaemias and lymphomas ranked second with 16.34%. Megaloblastic anaemia accounted for 2.33% and haemolytic anaemia represents 0.33% of the causes.

Discussion & Conclusion:
Our study shows that anaemia of chronic disorders is the most common cause of NCNC anaemia and our findings in this study will guide the clinicians in the approach towards to NCNC and help to direct to the appropriate investigations and in establishing the probable cause of NCNC.

PP-AH-47

Applying Lean Six Sigma in Reducing Waiting Time in the Radiology Department

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Background & Hypothesis:
Case study in a radiology department of a primary care institution that applied the Lean Six Sigma methodology and tools to reduce overall patient waiting time. The goal of the project was to identify factors that contribute to the overall patient waiting time in the radiology department and opportunities for improvements.

Methods:
Lean Six Sigma Define-Measure-Analyse-Improve-Control (DMAIC) methodology was used in this study. The study was conducted at a radiology department in a primary healthcare institution with an average annual patient volume of 15,657. Quantitative data were collected by analysing the data from RIS to determine arrival and discharge time of patient from the radiology department, total time spent in the department and interaction time between patient and staff.

Results:
Process capability analysis indicated that approximately 26% of patients (259,139 of 1,000,000) wait longer than 60 minutes—an overall Sigma level of 0.48 (3 * Ppk = 3 * 0.16). The low Sigma level suggests that improvements are needed to achieve the established goal of 1-hour patient waiting time. Three non-value-add activities were identified through value analysis. The root cause of patient waiting time has been identified to be originating from the processes of scheduling to the completion of the exam.

Discussion & Conclusion:
The findings revealed key issues that promote long patient waiting time in the radiology department and identified that the period of in-between scheduling and the completion of the examination as the point where most delay occurred. These findings contribute towards the identification of strategies that reduce patient waiting time.

PP-AH-48

Healthcare Workers' Wants vs Patient's Preference on the Instruction on Urine Sample Collection

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Background & Hypothesis:
In this study, we compared the type of instruction healthcare workers would use when: 1) instructing the patient on collection of midstream urine; 2) providing most clarity to patient; and 3) yielding the most suitable sample.

Methods:
Online survey was carried out where HCW would vote among the 3 choices of instruction and where it should be placed: 1) word instruction, 2) realistic pictorial depicting genital, and 3) comic pictorial depicting genital. Urine sample was analysed to determine the number of squamous epithelial cells which would indicate a poor collection of urine samples and potential contaminations from vaginal discharge or skin flora.

Results:
A total of 75 HCW were surveyed with an average age that was younger than their patients. Most chose comic pictorial to be placed in the toilet. Majority of patient surveyed chose realistic pictorial to be placed in toilet. Less than 15% of both categories finds that the realistic pictorial is too explicit and should be placed in toilet, if needed. The instruction was ultimately placed at the laboratory counter in view of the graphical image of the genital.

Discussion & Conclusion:
Word instruction would not work on a small fraction of illiterate patients. The perception that the Asian population is more conservative may be true and HCW needs to balance this with its clinical needs for a right diagnosis. HCW needs to embrace the differences in the age, education level and medical knowledge of patients, especially with a silver tsunami phenomenon and find ways to reach out to all patients in a timely and cost-efficient manner. Incorporating the patient's view in the planning would be imperative.

PP-BSTR-01

Potential Geographical Dispersion of Respiratory Cases in Singapore Following Point-Source Release of Anthrax Spores and its Implications for Geospatial Surveillance Countermeasures

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Background & Hypothesis:
Bioterrorism from aerosolised anthrax can result in many cases presenting with febrile respiratory illness but geographically dispersed from the release site. The potential of geospatial disease surveillance to detect an anomalous event will depend on the timing of release, and the site of release.

Methods:
A cross-sectional survey at 13 randomly selected malls was analysed. Distances between subject residences and survey site, and pair-wise distances between subject residences were used as indicators of geographical dispersion. We used random-intercept multilevel linear regression to assess association between subject and survey characteristics, and distance from survey site. Finally, we calculated the centroid of all subject residences at each survey site to localise the site of release.

Results:
Data included 271 subjects from city centre and 994 from heartland malls; median distances from subject residence to survey site were 10.2 km (6.1-14.1 km) and 1.0 km (0.6-2.2 km), while pair-wise distance between subject residences was 10.9 km (7.0-15.2 km) and 1.7 km (0.9-4.3 km) respectively. Multilevel linear regression confirmed that heartland subjects were less dispersed (β = -1.63; *P* <0.001) than for city centre; also, the most and least dispersed age group were those aged 20-29 (β = 0.21; *P* = 0.02) and 70 or older (β = -0.97; *P* = 0.02) respectively. Centroids for city centre sites were 4.7 km to 8.3 km from the actual survey site (median 6.4 km) compared to 0.1 km to 1.0 km for heartland sites (median 0.5 km).

Discussion & Conclusion:
In point-source release of anthrax, site of release has an overwhelming influence while the timing of release has little bearing. Should satellite towns be targeted, centroids from cases' residential addresses may help localise the source.

PP-BSTR-02

Development and Production of Radiopharmaceuticals under GMP Condition

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Background & Hypothesis:
The Clinical Imaging Research Centre (A*STAR/NUS) develops and produces radiopharmaceuticals for PET (positron-emission tomography) under GMP conditions for use in human clinical research projects at CIRC.

Methods:
A PETrace860 cyclotron generates radionuclides with a short half-life (15O = 2 min, 13N = 10 min, 11C = 20 min, 18F = 110 min) for clinical research applications. With dedicated remote controlled synthesis units, these radionuclides are incorporated in molecules that are used for clinical investigations performed on PET/MR and/or PET/CT scanners. CIRC is performing method development and validation of several C-11 and F-18 labelled radiopharmaceuticals: [11C]PIB Alzheimer's disease [11C] acetate cardiac imaging [18F] DCFPyL prostate cancer [18F] FIAU imaging of viral thymidine kinase activity in EBV-associated nasopharyngeal carcinoma other radiopharmaceuticals in an initial setup stage [13N] NH3 blood vessel perfusion of tissues (cardiac perfusion) [15O] H2O myocardial blood flow.

Results:
The Alzheimer's disease imaging agent [11C] PIB has successfully been synthesised in good radiochemical yield and purity in consecutive productions. Both the prostate cancer imaging agent [18F] DCFPyL and the viral thymidine kinase activity imaging agent [18F] FIAU are in the validation stage.

Discussion & Conclusion:
A portfolio of radiopharmaceuticals is being developed to supply the clinical demand for radiopharmaceuticals to the Singapore community in collaborative human clinical research projects such as oncology, cardiology, neurodegenerative diseases and neuroinflammation. Furthermore CIRC participates in projects to develop radiolabelled analogues of potential drugs to confirm drug binding to targets, elucidate relationships between receptor binding (occupancy) and pharmacokinetic effects or drug passage.

PP-BSTR-03

Aripiprazole As an Adjunct for Weight Loss in Patient's Established on Clozapine and Olanzapine

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Background & Hypothesis:
Aripiprazole is an atypical antipsychotic with a novel partial agonist activity at D2 receptors. Due to its unique pharmacological profile, it has a favourable metabolic and cardiovascular profile. A retrospective study was conducted to ascertain the effect of aripiprazole with antipsychotics on the body weight of outpatient clinic patients.

Methods:
Retrospective analysis of data from outpatient clinic patients at Institute of Mental Health (IMH) Singapore was carried out after obtaining necessary permissions. Ninety-nine patients who were on either olanzapine or clozapine together with aripiprazole in the past 2 years were identified. A detailed examination of the patient medical records was carried out to exclude patients who were not prescribed aripiprazole as an adjunct (whilst being on olanzapine or clozapine), did not have weight measurement at time of initiation of aripiprazole, or at 4-12 weeks discontinued aripiprazole within 4 weeks, or were not compliant to either medications. Twenty-nine patients were included for the final analysis.

Results:
Of the 29 patients, 25 (85%) experienced weight loss when using aripiprazole as an adjunct. The average weight loss was 1.6 kgs and median weight loss was 1.5 kgs. Paired sample t-test to assess the difference in weight between baseline and 4-12 weeks end-point showed a statistically significant difference (two tailed $P = 0.001$).

Discussion & Conclusion:
Based on the preliminary study, a double blind randomised controlled trial of the use of aripiprazole versus placebo as an adjunct for weight loss in outpatients established on olanzapine and clozapine is proposed for further research.

PP-BSTR-04

Coronary Atherosclerosis Characterised by Intimal Collagen Thinning and Disintegration in Periodontitis Rat Model

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Background & Hypothesis:
Intimal collagen construct fibrous cap of atherosclerotic plaque. This structure is very important that determines the stability of atherosclerotic plaque. Thinning and disintegration of its structure can make atherosclerotic plaque become vulnerable to rupture leading to trigger arterial thrombosis. Periodontitis contain inflammatory and bacterial products which readily invade into systemic circulation and potentially induce morphological change of coronary artery leading to accelerate and worsen atherosclerosis.

Methods:
Fourteen rats (Rattus norvegicus), were divided into control and periodontitis group (7 rats each group). Periodontitis rat model was created by means of inserting wire ligature around molar mandibular teeth followed by injecting periodontitis bacteria *Porphyromonas gingivalis* in gingival sulcus. Chronic periodontitis was conditioned by regular injection of *P. gingivalis* thrice a week. The experiment was conducted for 5 weeks. Periodontitis were confirmed by the occurrence of alveolar bone resorption. At the end of the experiment, all rats were sacrificed. Their hearts that contain coronary arteries were removed, trimmed cross-sectionally and prepared for histochemistry assay using collagen staining kit (Picrosirius red) and hematoxilin-eosin staning. Atherosclerosis indicators were intima-media thickening, the existence of atheroma and stenosis. Structure of intimal collagen was analysed qualitatively, as intact, thinning and disintegration.

Results:
Coronary artery of periodontitis rat models demonstrated signs of atherosclerosis such as intima-media thickening, progression of atheroma and stenosis. Intimal collagen showed thinning and disintegrated.

Discussion & Conclusion:
Periodontitis induces and worsens coronary atherosclerosis characterised by intimal collagen thinning and disintegration. This may lead atherosclerotic plaque prone to rupture which may increase the risk of acute coronary syndrome in periodontitis.

PP-BSTR-05

Integrated Plasmid and Bacterial Whole-Genome Sequencing Powers High-Resolution Tracking of NDM Transmission and Evolution for Infection Control

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Background & Hypothesis:
Spread of NDM-positive Gram-negatives is complicated by 3 tiers of gene spread—inter-plasmid gene module transposition, interbacterial plasmid conjugation and interhost bacterial transfer. We aimed to discern NDM transmission pathways in Singapore to inform infection control.

Methods:
All globally available Gram-negative (n = 4000) and NDM (n = 60) full-plasmid sequences from NCBI, and 33 whole-genome (bacterial and plasmid) NDM-bearing clinical isolates from Singapore were analysed using a novel virtual-microarray phylogenetic model.

Results:
NDM-bearing plasmids (n = 60), documented from all continents, was resolved into 9 plasmid clades (*Enterobacteriaceae,* n = 8, mainly *E. coli* and *K. pneumoniae,* and *Acinetobacter sp*., n = 1). Among 33 NDM-positive Singapore *Enterobacteriaceae* isolates sampled from 4 hospitals (period: 2010 to 2014), plasmid *pNDM-ECS01* (Clade 2, countries: Thailand and Australia) accounted for 20 (61%) isolates—*E. coli* (n = 8, varied STs), *K. pneumoniae* (n = 11, varied STs) and *E. cloacae* (n = 1). Plasmid *pPMK1-NDM* (Clade 8, countries: Nepal, Morocco, USA and China) accounted for 7 (21%) isolates, all in 2014 – all *K. pneumoniae ST147*. Extensive clonal bacterial-plasmid transmission between 2 hospitals was observed for *pPMK1-NDM-K. pneumoniae ST147*, whereas *pNDM-ECS01* demonstrated minimal clonal bacterial spread between hospitals.

Discussion & Conclusion:
NDM transmission in Singapore is dominated by 2 plasmid clones with different transmission success and strategies. *pNDM-ECS01* circulates regionally (Southeast Asia and Oceania) and conjugates extensively. *pPMK1-NDM*, an emerging plasmid in Singapore first documented in 2014, is successful at a global level (Nepal, Morocco, USA and China). The *pPMK1-NDM-K. pneumoniae ST147* combination demonstrates rapid interinstitutional spread.

PP-BSTR-06

GSK3ÃŸ Plays a Pivotal Role in LFA-1 Signalling for T-Cell Migration and Effector Functions

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Background & Hypothesis:
T-lymphocytes are critical for host defence and are also major drivers of immune-mediated diseases. Mechanisms mediating diverse functioning of T-cells are well characterised, but therapeutic targeting for safe and reversible modulation of immune responses is still an unmet need. This study aims to investigate potential role(s) of GSK3β, a serine/threonine kinase initially identified as a regulator of glycogen metabolism, in T-cell migration and effector functions.

Methods:
Primary human T-cells and T-cell line HuT78 were stimulated to migrate via LFA-1/ICAM-1 cross-linking. Standard molecular and imaging assays including Western immunoblotting, confocal microscopy and high content analysis were performed.

Results:
LFA-1 signalling for T-cell migration transiently inactivated GSK3β by up-regulating Ser9 phosphorylation (~3-fold) in 10 minutes. LFA-1 stimulation in T-cells also induced GSK3β nuclear translocation. We detected GSK3β-mediated molecular crosstalk between LFA-1 signalling and Notch pathway in migrating T-cells. In silico structural analysis showed a physical interaction between GSK3β and Notch1 intracellular domain, which was further confirmed by co-immunoprecipitation. GSK3β inhibitor increased cellular Notch1 activity in T-cells by ~3-fold. Moreover, LFA-1 signalling promoted Notch-dependent T-cell Th1 polarisation by inducing IFNγ secretion and Tbet expression (~2-fold increase). Of note, peripheral and splenic T-cells isolated from patients with type1 diabetes or thyroiditis showed constitutively high expression of Tbet.

Discussion & Conclusion:
We demonstrate crucial roles of GSK3β in LFA-1-signalling for T-cell migration and in Th1 polarisation. While clinical use of LFA-1 antagonists is limited by toxicity related to immunosuppression, targeting GSK3β pathway could be promising for tunable dampening of T-cell-mediated chronic inflammatory responses.

PP-BSTR-07

Pharmacogenetic Study of Lipid-Lowering Therapy with Rosuvastatin in Coronary Artery Disease Patients

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Background & Hypothesis:
Polymorphic genes involved in the regulation of lipid metabolism may be responsible for interindividual differences in efficiency of hypolipidaemic therapy. In the present prospective and randomised study, we investigated the efficacy of rosuvastatin (10 mg/day) in lipid-lowering therapy in 62 patients with coronary artery disease (CAD) possessing different genotypes of lipoprotein lipase (LPL) gene.

Methods:
One-year therapy with rosuvastatin was carried out under the control of lipid metabolism parameters including total cholesterol, LDL-C, HDL-C, cholesterol unlinked to HDL, triglycerides, atherogenic index at the baseline and 4th, 8th, 24th and 48th week. The +495T >GI polymorphism (*rs320*) of the LPL gene was genotyped in the patients through a real-time PCR TaqMan assay.

Results:
Rosuvastatin exerted a significant hypolipidaemic effect against all investigated lipid metabolism parameters by 24 weeks of therapy. Changes in parameters of lipid metabolism upon rosuvastatin treatment differed in CAD patients with genotype *+495GG* compared with the rest LPL genotypes. A genotype *+495GG* had a greater reduction in total cholesterol at week 8, LDL-C, cholesterol unlinked to HDL and atherogenic index at the 48 week of rosuvastatin therapy ($P < 0.01$) in comparison with the *+495TT* and TG genotypes.

Discussion & Conclusion:
The study findings suggest that the pronounced hypolipidaemic effect of rosuvastatin in homozygotes *+495GG* of the LPL gene could be associated with modulation of lipoprotein lipase activity, as it was previously reported for other statins. The study was supported by the Russian Research Foundation (No.-15-5-10010).

PP-BSTR-08

Genes Involved in Vascular Homeostasis are Responsible for Alterations in Erythrocyte Membrane Proteins in Patients with Essential Hypertension

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Background & Hypothesis:
Alterations in structural and functional properties of the cell membrane may represent disease-associated intermediate phenotypes reflecting the mechanisms of essential hypertension (EH). The study was designed to assess the effects of polymorphisms in genes associated with EH on the variation of erythrocyte membrane proteins (EMPs) in hypertensive patients.

Methods:
Major EMPs content was analysed in blood from 1162 unrelated Russians (235 hypertensive patients, 176 healthy controls and 751 random individuals from the Central Russia population). EH patients were genotyped for 11 polymorphisms of EH susceptibility genes including *ADD1 (rs4961), GNB3 (rs5443, rs16932941), NOS3 (rs1799983, rs2070744), ACE (rs5186), AGTR1 (rs5186), AGT (rs699, rs4762), MR (rs5534),* and *TGFB1 (rs1800471).*

Results:
Gender-specific differences in EMP contents between the cases and controls were observed. Regardless of gender, hypertensives exhibited mainly decreased levels of alpha- (SPTA1) and beta-spectrin (SPTB) and increased levels of glucose transporter (GLUT1) as compared with healthy subjects ($P \leq 0.001$). The EH susceptibility genes showed considerable effects on the levels of spectrins and glucose transporter. A joint variation of the genes explained about half the total polygenic variance in the GLUT1, SPTA1 and SPTB levels in hypertensives.

Discussion & Conclusion:
The study showed that EH susceptibility genes are the important factors of the inherited EMP variation, and their pleitropic effects may be mirrored in the altered expression of genes encoding cytoskeletal proteins and those related to intracellular glucose metabolism. The study was supported by the Russian Research Foundation (No.-15-15-10010).

PP-BSTR-09

The Contribution of *MTHFR C677T* Polymorphism to Peripheral Artery Disease in Diabetic Patients

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Background & Hypothesis:
Disorders in blood coagulation may play a role in peripheral artery disease. The aim of this study was to investigate the association between functional polymorphism *C677T (rs1801133)* of *methylenetetrahydrofolate reductase* (*MTHFR*) gene for and risk of peripheral artery disease in diabetes patients.

Methods:
The study sample included 434 unrelated Russian patients (50 patients with diabetic angiopathy of lower limbs and 384 healthy subjects). Genotyping of the polymorphism was performed by TaqMan assay.

Results:
No statistically significant differences in frequencies of the *MTHFR* alleles and genotypes were found between the study groups, as between entire groups as well as between gender stratified groups (P >0.05). However, we found that the *677TT* genotype showed an association with increased risk of the disease in male smokers (OR = 4.2 95% CI 1.28-13.79, P = 0.01), whereas non-smoker carriers of the *677TT* genotype did not exert the disease risk.

Discussion & Conclusion:
Thus, increased risk of peripheral artery disease (diabetic angiopathy) is attributed to the interaction between the *MTHFR* gene polymorphism and tobacco smoking, pointing out to an importance of gene-environment interactions in disease susceptibility. We suggest that disease risk in patients with "thrombotic genotype" of the *MTHFR* gene is triggered by tobacco smoking exposure. The study was supported by the Russian Research Foundation (No.-15-15-10010).

PP-BSTR-10

Association of Polymorphic Markers *rs243865* and *rs3025058* with the Development of Arterial Hypertension

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Background & Hypothesis:
Essential hypertension is a multifactorial polygenic disease with a highest incidence in the world. The purpose of the study was to assess the relationship between gene polymorphisms *MMP2-1586S>T (rs243865)* and *-1612 5A/6A MMP3 (rs3025058)* with the development of arterial hypertension in population of the Central Chernozem region of Russia.

Methods:
Study group included unrelated 1065 subjects: 534 patients with hypertension and 531 controls. The groups included individuals of Russian origin, who are inhabitants of the Central Chernozem region. Genomic DNA was obtained from study patients and extracted by phenol-chloroform extraction. Genotyping of the polymorphisms study was carried out using real-time polymerase chain reaction with Taq-Man probes.

Results:
The frequency of allele *-1612 6A MMP3* was significantly higher (54, 96%) in hypertensive patients as compared to the control group (46, 05%, $\chi^2 = 8, 57$, $P = 0.004$, OR = 1.43, 95% Cl 1.12-1.82). The frequency of genotypes *-1612 5A/5A* was 22, 28% in hypertensive patients and 32, 11% in controls ($\chi^2 = 6, 72$, $P = 0.01$, OR = 0.61, 95% Cl 0.41-0.89). No significant differences between the groups were found regarding to allele and genotype frequencies of the *1586S>T* polymorphism of the *MMP2* gene.

Discussion & Conclusion:
The allele *-1612 6A MMP3* is a risk factor of arterial hypertension in Russians from the Central Chernozem region of Russia. The study was supported by the project ("Studying of the genetic risk factors for multifactorial diseases").

PP-BSTR-11

Association Study of Genetic Polymorphisms of Vasoactive Hormones with the Risk of Preeclampsia

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Background & Hypothesis:
Vasoactive hormones play an important role in the pathogenesis of preeclampsia. Investigations focused on the molecular genetic mechanisms of preeclampsia are limited. The present study was designed to investigate an association of genetic polymorphisms of vasoactive hormones with the risk of preeclampsia.

Methods:
A total of 459 women comprising 250 patients with a diagnosis of preeclampsia (18-44 years old) and 209 healthy controls (18-42 years old) were recruited for the study. The following genetic polymorphisms of vasoactive hormones were investigated: *+46G/A ADRB2, 4a/4b eNOS, K198N ET-1*. Genotyping of the gene polymorphisms were done using a real-time polymerase chain reaction with TaqMan probes. Statistical analysis was performed with STATISTICA for Windows 8.0.

Results:
It was found that the combinations of the 2 genetic variants such as *-4b eNOS* and *198N ET-1*, and also *198N ET-1* and *+ 46A ADRB2* were 1.4-1.6 higher among pregnant women without preeclampsia (35.89% and 23.65%, respectively) than among women with preeclampsia (25.6%, Pcor = 0.04, 14.46%, Pcor = 0.032, respectively).

Discussion & Conclusion:
The study suggests that combinations of *198N ET-1, 46A ADRB2, 4b eNOS* variants exert protective effects against the risk of preeclampsia. The study was supported by the project ("Studying of the genetic risk factors for multifactorial diseases").

PP-BSTR-12

Prevalence of *BRCA1* and *BRCA2* Mutations in Breast Cancer Patients in Russia

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Background & Hypothesis:
Breast cancer (BRCA) is the most common neoplastic disease in women. Being mostly sporadic, about 5-10% of cases are genetically determined. Women with inherited mutation in the BRCA genes have a significant increase in risk of breast cancer and certain other cancers. *5382insC, 185delAG, 4153delA* in *BRCA1* and *6174delT* in *BRCA2* genes are the most known mutations in these tumour suppressor genes.

Methods:
The study enrolled 217 women (mean age 54.2 ± 7.5 years) with breast cancer from the regional oncology dispensary with histologically verified diagnosis and 160 healthy women (mean age 54.4 ± 11.0 years) as a control group. After extraction of DNA from peripheral blood using phenol-chloroform method, all samples were genotyped for *BRCA1* and *BRCA2* polymorphisms by real-time PCR using TaqMan technology for allele discrimination.

Results:
The analysis of the frequency *BRCA1/2* mutations showed that among 217 patients with breast cancer, 7 women had *BRCA1 5382insC* variant (3.2%) and no one had *185delAG, 4153delA* in *BRCA1* and *6174delT* mutations in *BRCA2*. Screenings for these mutations in 160 healthy women showed the homozygosity status.

Discussion & Conclusion:
Compared with some other published papers, this one confirms frequent occurrence of *BRCA1 5382insC* variant in geographically distant regions of Russia, such as Moscow (3.5%), St Petersburg (4.0%), and Siberia region (1.92%). The presented data point to a conspicuous contribution of *BRCA1 5382insC* mutation in breast cancer development in Belgorod region of Russia that may justify an extended *BRCA1 5382insC* screening among women of our population.

PP-BSTR-13

The Association Study of Functional Polymorphism of Matrix Metalloproteinase Gene with Preeclampsia Risk

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Background & Hypothesis:
There is a limited data on the role of matrix *metalloproteinase-1 1G/2G* polymorphism and preeclampsia development. Moreover, available literature data are inconclusive therefore the present study was designed to examine a possible association of *MMP1 1G/2G* polymorphism with preeclampsia.

Methods:
A total of 650 participants comprising 300 patients with a diagnosis of preeclampsia (18-44 years old) and 350 healthy controls (19-41 years old) were included in the study. Genotyping of the *MMP1 1G/2G* gene polymorphism was performed by a real-time polymerase chain reaction (TaqMan assay). Statistical analysis was performed using STATISTICA for Windows 6.0.

Results:
The frequency of allele *1G MMP1* was 51.34% in patients and 51.73% in controls. The frequencies of 1*G/1G, 1G/2G* and *2G/2G* genotypes were 27.18% 48.32% and 24.50% in preeclampsia patients, and 27.67%, 48.13% and 24.21% in controls, respectively. A comparative analysis of allele and genotype frequencies of the *MMP1 1G/2G* gene polymorphism between preeclamptic woman and the control group did not show significant differences ($P > 0.05$).

Discussion & Conclusion:
Our results suggest that *MMP1 1G/2G* gene polymorphism does not contribute to the genetic risk of preeclampsia. This work was supported by state assignment of the Ministry of Education and Science of the Russian Federation ("Study of the genetic risk factors of multifactorial human diseases").

PP-BSTR-14

Association of Genetic Polymorphisms *rs4374421, rs7759938* and *rs466639* with Uterine Hyperplastic Processes

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Background & Hypothesis:
Uterine hyperplastic processes such as of endometrium, uterine leiomyoma, genital endometriosis are mostly common pathological conditions among gynaecological diseases. The disorders have shared pathogenetic mechanisms and may be diagnosed in combinations.

Methods:
Study sample comprised 1873 unrelated women including 908 women with uterine hyperplastic processes and 965 women of healthy controls. The case and control group were of Russian origin coming from Central Region of Russia. Patients with uterine hyperplastic processes were examined by experienced gynaecologists and instrumental investigations (ultrasound diagnosis, hysteroscopy) have been done. Genotyping of single nucleotide polymorphisms *rs4374421, rs7759938* and *rs466639* was performed using TaqMan assays. APSampler software was utilised to assess the association of genotype combinations with occurrence of uterine hyperplastic processes.

Results:
It has been observed that the combination of genetic variants *C rs4374421* with *C rs7759938* and *C rs466639* occur in 20.81% of affected women and in 27.78% of healthy women ($P = 0.0004$, ĐžR = 0.68, 95% CI, 0.55-0.85).

Discussion & Conclusion:
The study revealed a protective effect of allelic combination of *C rs4374421* with *C rs7759938* and *C rs466639* against uterine hyperplastic processes. The study was supported by the project ("Studying of the genetic risk factors for multifactorial diseases").

PP-BSTR-15

Genetic Variation of Inflammatory Cytokines Contributes to Acute Non-Biliary Pancreatitis in Russians

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Background & Hypothesis:
Interleukins are potential mediators of the inflammatory response, and play a crucial role in the development and progression of various inflammatory diseases including pancreatitis. In particular, increased secretion of the inflammatory cytokines, such as IL1 and IL6 is important factor in promoting the pathological processing of acute pancreatitis. The aim of this study was to investigate whether common polymorphisms *-511C>T (rs16944)* of the IL1 gene and *-174G>C (rs1800795)* of the IL6 gene are associated with susceptibility to acute pancreatitis in Russians.

Methods:
The study sample included 530 unrelated Russian patients (295 patients with acute pancreatitis and 235 healthy subjects. Genotyping of the polymorphisms was done by TaqMan-based assay.

Results:
We found that genotype *-511T/C* of the IL1 gene was significantly associated with increased risk of acute pancreatitis (OR = 2.02, 95% CI 1.41-2.87, P <0.01). No statistically significant differences in allele and genotype frequencies of the IL6 gene were found between the case and control groups, as between entire groups as well as between gender stratified groups (P >0.05). However, we found that the *-174GC* genotype of the IL6 gene is associated with increased risk of the acute non-biliary pancreatitis in females (OR = 2.81, 95% CI 1.19-6.60, P = 0.02).

Discussion & Conclusion:
Polymorphisms of genes encoding inflammatory interleukins such as IL1 and IL6 are important genetic determinants of susceptibility to acute pancreatitis in Russians. The IL6 gene polymorphism exerted gender-specific effect on susceptibility to non-biliary pancreatitis.

PP-BSTR-16

An Association of the Deletion Polymorphism of Glutathione S-Transferase Gene with the Risk of Acute Pancreatitis in Russian Population

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Background & Hypothesis:
It has been found that functionally significant variants of glutathione S-transferase genes might be the proper candidates for genes responsible for pancreatitis. Inconsistent results of association studies investigated the role of glutathione S-transferase genes in pancreatitis may be explained by inter-ethnical differences in disease susceptibility. The aim of this study was to investigate the association between deletion polymorphisms of *GSTM1* and *GSTT1* genes and risk of acute pancreatitis.

Methods:
The study sample included 468 unrelated Russian patients (299 patients with acute pancreatitis and 169 healthy subjects). Total DNA was purified from blood samples of study participants by phenol chloroform extraction and ethanol precipitation according to standard procedure. DNA samples were genotyped by a multiplex polymerase chain reaction method.

Results:
A carriage of homozygous deletion genotype of the *GSTM1* gene is significantly associated with decreased risk of acute pancreatitis (OR = 0.67, 95% CI 0.46-0.99 *P* = 0.04). There was no difference in the frequency of *GSTM1* null genotype between patients with acute pancreatitis and healthy subjects.

Discussion & Conclusion:
The study revealed a protective effect of the deletion *GSTM1* genotype against the risk of acute pancreatitis in Russian population. However, before drawing definitive conclusions, further investigations are required to confirm the contribution of the *GSTM1* gene polymorphism to the risk of acute pancreatitis in other populations.

PP-BSTR-17

Genetic Association between the *CYBA 640A>G* Polymorphism and the Risk of Uterine Myoma

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Background & Hypothesis:
Reactive oxygen species (ROS) have been proposed to play a significant role in the aetiology of uterine myoma. Increased production of reactive oxygen species, especially superoxide anion, significantly may contribute to the oxidative stress associated with myoma. The aim of this study was to investigate the association between functional polymorphism *640A>G (rs1049255)* of the CYBA (cytochrome b-245, alpha polypeptide of NADPH oxidase) gene and the risk of uterine myoma.

Methods:
The study sample included 488 unrelated patients from Central Russia (287 patients with uterine myoma and 201 healthy women). Genotyping of the polymorphism was performed by TaqMan assay.

Results:
The CYBA genotype frequencies were in agreement with Hardy-Weinberg equilibrium in the case and control groups ($P > 0.05$). The frequency of the *640A* allele was higher in patients with uterine myoma (0,542) comparison to control (0,463): OR = 1.37, 95% CI 1.06-1.77, $P = 0.01$. We found that the *640GG* genotype was associated with the lower risk of uterine myoma (OR = 0.65, 95% CI 0.43-0.98, $P = 0.04$).

Discussion & Conclusion:
NADPH oxidases play a major role in the production of superoxide anion radicals. The functional *640A>G* variant might modify mRNA processing and stability. Enhanced ROS production in the carriers of the *640A* allele may result in increased angiogenesis, production of the extracellular matrix, cytokines and growth factors, thus promoting the development of uterine myoma.

PP-BSTR-18

Are Our Children Eating a Balanced Diet? A Food Group Analysis of the Diets of 3-Year-Old Children in Singapore

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Background & Hypothesis:
There is little local data on the diets of toddlers. A pilot study was conducted to assess the diets of 3-year-old children and compare intakes to the food group recommendations by the Health Promotion Board (HPB).

Methods:
Diets of 70 Chinese children were collected using 24-hour food recall. Care was taken to ensure that there were both weekday and weekend diets in the sample. All food and drinks consumed were categorised into the respective food groups and the quantities were compared against serving recommendations from HPB. Composite foods were first broken down into their base ingredients before categorisation.

Results:
On average, the children consumed 3.8 servings of rice and alternatives; 0.8 serving of fruit; 0.5 serving of vegetables; 1.5 servings of meat and alternatives; and 2.2 servings of milk and alternatives. Relatively, more children (33.3%) were able to meet the recommended 3-4 servings of rice and alternatives compared to other food groups. Fruit and vegetable intakes were insufficient, with 55.1% and 81.2% consuming less than the recommended amounts (1 serving each) respectively. Nearly 34.8% did not meet the recommendations for milk and alternatives. For the meat and alternatives group, 2 in 3 children (59.4%) exceeded the recommended servings.

Discussion & Conclusion:
This pilot study suggests that the diets of most 3-year-old children in Singapore are not well balanced. Further research with a nationally representative sample should be conducted to confirm these findings. Such data will influence public health education, physician counselling, nutrition policies as well as food manufacturing and services for children.

PP-BSTR-19

What is the Role of Growing-Up Milk in Children's Diets? Analysis on the Nutrient Contribution of Growing-Up Milk to the Diets of 3-Year-Old Children in Singapore

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Background & Hypothesis:
Growing-up milk (GUM) is a milk-based formula fortified with nutrients for children. This study aims to investigate the nutritional contribution of GUM to the diet of children in Singapore.

Methods:
Diets of 70 Chinese children were collected using 24-hour food recall, with weekday and weekend diets as part of the sample. Analysis was performed on a subset of GUM consumers. Nutrient contribution of GUM to the diet was assessed, and modelling was performed to evaluate the replacement of GUM with unfortified whole milk (WM) and reduced-fat milk (RFM).

Results:
GUM contributes 28.9% of calories, 24.9% protein, 26.7% carbohydrate and 36.6% fat to the diet. GUM accounts for 64.4% calcium, 56.6% vitamin D, 33.8% linoleic acid, 34.3% linolenic acid and 35.0% DHA. Compared to the WM diet, GUM diet provided 5.2% more calories with 10.9% less saturated fat. It also supplied 43.9% more vitamin D, 19.8% more linoleic acid and more folate, iron and zinc. In WM diet, the recommended intakes for vitamin D and folate will not be met ($P = 0.000$). Compared to the RFM diet, GUM diet contributed 48.4% more vitamin D, 33.8% more linoleic acid, 34.3% more linolenic acid and more folate, iron and zinc. In RFM diet, the recommended intakes for linoleic acid, linolenic acid, vitamin D and folate will not be met ($P = 0.000$).

Discussion & Conclusion:
GUM helps children meet nutrient recommendations better than WM and RFM. Being nutrient-dense, GUM is a practical and convenient option to provide key nutrients to support overall growth and development, especially of the brain and bone.

PP-BSTR-20

The Effect of Superstitious Thinking on State Anxiety and Perceived Task Performance

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Background & Hypothesis:
Paranormal belief is defined as belief in phenomena, which are scientifically unsubstantiated (Irwin, 2009). Superstitious thinking, a subset of paranormal belief, refers to the belief that there is a causal link between action and outcome when no such causation exists (Thalbourne, 1997). Superstitious thinking is more prevalent in stressful situations (Burger & Lynn, 2005). However, the evocation of superstitious thinking in response to a psychosocial stressor remains untested. The current study aimed to explore whether the indication that a pen is "lucky" would influence the psychological response to Trier social stress test, and whether the superstitious thinking facilitated the perception of task performance.

Methods:
Participants (n =114) aged between 17 and 59 years (M = 22.98, SD = 4.57) from James Cook University Singapore were randomly assigned to 1 of 4 conditions: 1) no-stress without "lucky" pen; 2) no-stress with a "lucky" pen; 3) stress without "lucky" pen; 4) stress with a "lucky" pen.

Results:
Following exposure to stressor, participants with a "lucky" pen reported lower state anxiety throughout the session, suggesting that the pen may have evoked superstitious thinking and altered the psychological appraisal of stress. Participants exposed to the stressor with a "lucky" pen perceived their performance to be much better than participants exposed to stressor without it.

Discussion & Conclusion:
These results suggest that superstitious thinking may be a unique coping strategy that helps in altering the appraisal of stressful situations. This has implications for understanding how people may engage in repetitive behaviours that have no causal relationship with favourable outcomes.

PP-BSTR-21

Central Arterial Stiffness is Associated with Systemic Inflammation among Asians with Type 2 Diabetes

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Background & Hypothesis:
Atherosclerosis is a main cause of morbidity and mortality in type 2 diabetes (T2DM) patients. Inflammation plays an important role in the development and progression of atherosclerosis. We aim to examine the relationship between inflammation and central arterial stiffness (a proxy of atherosclerotic burden) in a multi-ethnic T2DM Asian cohort.

Methods:
Arterial stiffness was estimated by carotid-femoral pulse wave velocity (PWV) and augmentation index (AI) in the Singapore Study of Macro-angiopathy and Micro-vascular Reactivity in Type 2 Diabetes (SMART2D) (n = 2057). Linear regression model was used to evaluate the association of high sensitivity C-reactive protein (hs-CRP) and soluble receptor for advanced glycation end-products (sRAGE) with PWV and AI. Hs-CRP was analysed as a continuous variable and categories (<1, 1-3, and >3 mg/l).

Results:
There is no association between hs-CRP and PWV. In contrast, AI increases with hs-CRP as a continuous variable ($\beta = 0.279$, $P = 0.072$) and categories ($\beta = 1.140$, $P = 0.009$ for hs-CRP >3 mg/l) postadjustment for age, gender, ethnicity, height, systolic blood pressure (SBP), diastolic blood pressure (DBP) and BMI. There is no association between AI and sRAGE. However, each unit increase in lnsRAGE was associated with 0.260m/s decrease in PWV in all subjects ($P = 0.021$) postadjustment for age, gender, ethnicity, duration of diabetes, haemoglobin A1c, SBP, DBP, heart rate, BMI, low-density lipoprotein-cholesterol (LDL) and urinary albumin-to-creatinine ratio (ACR). Stronger association was observed in the subpopulation with elevated hs-CRP (>3 mg/l) ($\beta = -0.558$, $P = 0.004$).

Discussion & Conclusion:
Elevated hs-CRP and decreased sRAGE are associated with central arterial stiffness. Our results suggest the potential role of systemic inflammation in the pathogenesis of arterial stiffness in T2DM.

PP-BSTR-22

Potential Novel Inhibitors of Trypanosomatid Phosphoglycerate Mutases through Ligand-based and Structure-based in Silico Approaches

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Background & Hypothesis:
The parasitic protozoa from the order Trypanosomatida relies exclusively on glycolysis for its survival in the mammalian hosts. As a corollary, the enzymes in this pathway have been recognised as chemotherapeutic targets. Phosphoglycerate mutase (iPGAM), which is the seventh enzyme in the pathway, is of particular interest because it possesses no structural and biochemical relationship with the corresponding enzyme in human. This enzyme has also been validated as an attractive therapeutic target for the treatment of trypanosomatid diseases. The aim of this work is to identify small molecules or compounds that could potentially be developed into potent inhibitors of trypanosomatid iPGAMs through in silico approaches.

Methods:
In the search for novel inhibitors, a ligand-based virtual screening programme, Ultra Fast Shape Recognition with Atom Types (UFSRAT), was utilised to screen for compounds resembling the substrate/product of iPGAM (3-phosphoglycerate/2phosphoglycerate), before a structure-based approach was applied using AutoDock Vina and COmbining Docking And Similarity Search (CODASS) programmes. The inhibitory effects of selected compounds were subsequently tested by monitoring the oxidation of NADH through a continuous coupled assay system.

Results:
The results revealed that out of this collection of compounds, 7 compounds inhibited iPGAM's activity, with 1 compound from virtual screening analysis exhibited substantial inhibition (14% remaining activity).

Discussion & Conclusion:
Taken together, the findings from this study indicate that compounds which were discovered through in silico approaches have potentials to be developed as novel drugs that specifically target trypanosomatid iPGAMs.

PP-CR-01

Delirium Superimposed on Dementia: Phenomenological Differences between Patients with and without Behavioural and Psychological Symptoms of Dementia in a Specialised Delirium Unit

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Background & Hypothesis:
Overlap between neuropsychiatric symptoms of dementia and delirium complicates diagnosis of delirium superimposed on dementia (DSD). This study sought to examine differences in delirium presentation and outcomes between DSD patients with and without pre-existing behavioural and psychological symptoms of dementia (BPSD).

Methods:
This was a prospective cohort study of older adults with DSD admitted to a specialised delirium unit (December 2010 to August 2012). We collected data on demographics, comorbidities, illness severity, delirium precipitants, and cognitive and functional scores. Delirium severity was assessed using DRS-R-98 (Delirium Rating Scale-Revised-98) and CAM-sev (Cognitive Assessment Method Severity Score). Patients were categorised as DSD-BPSD+ and DSD-BPSD- based on elicited behaviour disturbances.

Results:
We recruited 174 patients with DSD (84.4 +/- 7.4 years) with 37 (21.3%) having BPSD. At presentation, delirium severity and symptom frequency on DRS-R98 were similar but DSD-BPSD+ more often required only a single precipitant (40.5% vs 21.9%, $P = 0.07$) and had significantly longer delirium duration (median days: 7 vs 5, $P <0.01$). At delirium resolution, DSD-BPSD+ exhibited significant improvement in sleep-wake disturbances (89.2% vs 54.1%, $P <0.01$), affect lability (81.1% vs 56.8%, $P = 0.05$), and motor agitation (73% vs 40.5%, $P <0.01$) while all non-cognitive symptoms except motor retardation were improved in DSD-BPSD-. Pharmacological restraint was more prevalent (62.2% vs 40.1%, $P = 0.03$) and at higher doses (chlorpromazine equivalents 0.95 +/- 1.8 vs 0.40 +/- 1.2, $P <0.01$) in DSD-BPSD+.

Discussion & Conclusion:
BPSD may increase vulnerability of dementia patients to delirium, with subsequent slower delirium recovery. Aggravation of sleep disturbance, labile affect, and motor agitation should raise suspicion for delirium among these patients.

PP-CR-02

Benefits of Advance Care Planning for Caregivers of Persons with Mild Dementia of Predominantly Chinese Ethnicity

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Background & Hypothesis:
Advance care planning (ACP) is a continuous process of conversations, discussions and engagement involving patients, caregivers and healthcare providers. For persons with mild dementia, ACP serves as a window of opportunity for ongoing discussions about future health care while still maintaining decisional capacity. We aim to evaluate the benefits of ACP for caregivers of persons with mild dementia of predominantly Chinese ethnicity.

Methods:
We recruited 20 English-speaking patient-caregiver dyads, who were predominantly Chinese. Patient-caregiver dyads underwent ACP counselling by a trained ACP facilitator, completed prepost surveys and participated in postcounselling interviews. We then conducted a concurrent explanatory mixed methods analysis.

Results:
Prior to ACP counselling, 50% of caregivers had heard of ACP and of these, only half had planned for future care. Post-ACP counselling (n = 19), majority found ACP helpful in understanding complications of dementia and exploring preferences for future treatment. Among 10 caregivers who had not heard of ACP, 5 proceeded to have further discussions after ACP counselling. ACP enhances caregivers' understanding of dementia and the persons with dementia, leading to initiation of conversations involving end-of-life care decisions that incorporate the patients' perspectives, planning for future care, and early involvement of other care providers (physicians and family members).

Discussion & Conclusion:
ACP in the mild stages of dementia promotes patient-centred care by enhancing caregiver's understanding and stimulating further conversations between patients and caregivers.

PP-CR-03

Prioritising ECG for Low Risk Chest Pain Patients in Emergency Department

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Background & Hypothesis:
An electrocardiogram (ECG) is an essential investigation for patients who present with chest pain. However, not all patients with chest pain have a cardiac diagnosis, hence ECG need not be done urgently.

Methods:
A retrospective cohort study was performed on emergency department (ED) attendees in the year 2010 presenting with the chief complaint of "chest pain" at triage. Data collected included: 1) demographics; 2) ED diagnosis (for discharged patients) and inpatient diagnosis (for admitted patients); 3) disposition after ED consult; 4) mode of arrival to ED; 5) presence of cardiovascular risk factors; and 6) vital signs at triage. Primary outcome was non-cardiac diagnosis at ED or inpatient. Data was analysed using logistic regression model for significant predictors. A simple and practical decision rule at triage is considered.

Results:
A total of 8081 patients were reviewed; 5717 (70.7%) patients were diagnosed with a non-cardiac cause of chest pain while 3855 (47.7%) were admitted for further investigation. Statistically significant variables which predicted non-cardiac chest pain include younger age (mean difference 11.8, P <0.001), female gender (adjusted OR: 1.273, 95% CI, 1.144-1.416), walk-in mode of arrival (adjusted OR: 1.988, 95% CI, 1.782-2.217), presence of hypertension (adjusted OR: 2.595, 95% CI, 2.095-3.215), and presence of hyperlipidaemia (adjusted OR: 3.435, CI, 2.993-3.943). A clinical decision rule using: 1) presenting complaint of chest pain; and 2) age <20 years old has a sensitivity of 1.9% and specificity of 99.9%.

Discussion & Conclusion:
An ECG need not be performed urgently at triage for patients ≤20 years old with isolated complaint of chest pain. Further validation of this clinical decision rule is needed to confirm its reliability.

PP-CR-04

Correlates of Body Weight and Aggression amongst School-aged Children with Disruptive Behaviour Disorder in Singapore

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Background & Hypothesis:
Childhood obesity is increasing in Singapore and is commonly associated with elevated aggression via activation of the dopaminergic pathways. Disruptive behaviour disorders (DBD) are also associated with increased aggression through this pathway. No study has explored the role of obesity in children with DBD in terms of aggressive behaviours; therefore this study aimed to determine factors that would influence body weight and aggression among school-aged children with DBD.

Methods:
A cross-sectional analysis of 282 children and adolescents with a DBD diagnosis as part of a randomised control trial examining the effects of supplements and social skills training was performed. Data from a range of physiological and psychological measures were explored to examine the relationship between sleep, diet, aggression and body weight.

Results:
A significant, positive correlation was observed between body mass index (BMI) and all components of aggression (anger, physical aggression, hostility and verbal aggression). Specifically, anger was found to be the best predictor of BMI. Lower dietiary intake of thiamin and docosapentaenoic acid was also found to predict higher levels of aggression. Further, those who received less than 8 hours of sleep were associated with greater anger and physical aggression.

Discussion & Conclusion:
The findings are consistent with previous literature on the association between BMI, aggression, sleep and diet conducted in Western samples but in an Southeast Asian context. The findings suggest the need to incorporate weight management, sleep and diet into psychosocial interventions for the treatment of aggression.

PP-CR-05

Clinical and Histopathological Predictors of Systemic Disease in Adult Henoch-Schönlein Purpura

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Background & Hypothesis:
One of the challenges in the management of adult Henoch-Schönlein purpura (HSP) is the difficulty in assessing the risk of systemic involvement, most importantly, renal involvement. Despite growing interest in recent years in investigating the predictive factors of systemic involvement in adult HSP, there are not many published studies in this area and results have sometimes been conflicting. This study sought to determine specific clinical and histopathological features associated with systemic involvement in an adult HSP.

Methods:
We retrospectively reviewed the records of 99 patients with HSP who presented at the National Skin Centre between January 2008 and May 2015. Data extracted included systemic involvement, distribution of cutaneous lesions, presence of blisters or ulcers, light microscopy and direct immunofluorescence findings on skin biopsy.

Results:
Of the 99 patients, 32 were male (32.3%) and the median age was 37 years (range, 18 to 72 years). Renal involvement was found in 56 patients (56.6%), joint involvement in 21 (21.2%), gastrointestinal involvement in 13 (13.1%) and any systemic signs in 67 (67.7%). We found a significant association between age of more than 30 years and renal involvement ($P = 0.01$). Multivariate regression analysis demonstrated that age of more than 30 years is an significant and independent predictive factor for renal involvement after controlling for confounders, with an adjusted odds ratio of 2.97 (95% confidence interval: 1.08-8.16, $P = 0.04$). Joint and gastrointestinal involvements are also associated with each other ($P < 0.01$).

Discussion & Conclusion:
Adult patients with HSP older than 30 years are almost 3 times more likely to have renal involvement compared to younger patients.

PP-CR-06

Baseline Behavioural Symptoms Impact on Clinical Disease Progression in Alzheimer's Dementia

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Background & Hypothesis:
Clinical phenotyping of AD patients is crucial to understanding disease progression and clarifying the role of biomarkers in diagnosis of AD. Current study aims to review the role of baseline factors in determining the rate of clinical progression in a tertiary memory clinic setting.

Methods:
We prospectively studied 101 subjects with mild to moderate AD of predominantly Chinese ethnicity. Baseline demographics, ApoE (ApoE E4+ or E4-) status, neuroimaging findings (vascular burden quantified by validated scale (ARWMC) and AD severity by medial temporal lobe atrophy (MTA) score together with assessments of cognition (CMMSE), functional (Lawton's iADL), behavioural (neuropsychiatric inventory, NPI) and social (Zarit caregiver burden) determinants. Fast progressors were defined by a decline of CDR-SB score of ≥2 points during 1-year follow-up. Logistic regression of significant univariate predictors, a priori determined covariates including age, gender, prior symptom duration, iADL, MTA, ARWMC and ApoE status were performed.

Results:
A total of 94 (93%) subjects completed 1-year follow-up, comprising 74 slow and 20 fast progressors. Significant baseline predictors of fast progression include baseline CMMSE scores, iADLs, Zarit caregiver burden and NPI severity scores (P <0.05). Upon multivariate analyses, NPI severity remained a significant predictor of fast progression (OR: 1.26, CI, 1.05-1.51, P = 0.015). Amongst behavioural symptoms, presence of delusions, depression, anxiety, apathy and aberrant motor behaviour were significantly higher amongst fast progressors (P <0.05).

Discussion & Conclusion:
This local study emphasises the importance of baseline neuropsychiatric symptoms in the prediction of disease progression in AD. Detailed assessment upon presentation, management with both non-pharmacological and pharmacological measures have significant impact on patient outcomes.

PP-CR-07

Pulmonary Tuberculosis Associated with Venous Thromboembolism: How to Diagnose and Treat?

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Background & Hypothesis:
Tuberculosis (TB) is among the most prevalent infectious diseases worldwide. Although venous thromboembolism (VTE) is a rare complication of this disease, it can be a potentially life-threatening event. Review of literature does not reveal any guidelines on diagnosis and management of VTE associated with TB.

Methods:
We report here 2 cases of severe pulmonary TB associated with VTE. In the first case, we report a young male with no apparent risk factors who had extensive unprovoked venous thrombosis extending into inferior venecava as an unusual presenting feature of PTB. In the second case, we report an elderly male, who presented with severe PTB, and was found to have concomitant pulmonary embolism.

Results:
The cases demonstrated that physicians should have a high index of suspicion for the diagnosis of VTE in patients with PTB so that prompt treatment can be instituted in order to prevent fatal outcomes. The cases also illustrate that physicians should consider TB as 1 of the possible risk factors for development of VTE.

Discussion & Conclusion:
Pulmonary TB-induced vascular inflammation is more common than thought about to be associated with a hypercoagulable state. We will highlight in this presentation what are the situations wherein we should suspect pulmonary TB as a possible risk factor for VTE and when we should suspect VTE, especially pulmonary embolism, in patients with pulmonary TB. The treatment is also challenging in view of drug interactions of warfarin with the anti-tubercular treatment. We will conclude with our recommendations on how to treat patients with VTE associated with pulmonary TB.

PP-CR-08

Pulmonary Involvement among Patients from the Singapore Sjogren's Syndrome Study

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Background & Hypothesis:
The study aimed to study the pulmonary manifestations of Sjogren's syndrome (SS) from a Singapore cohort.

Methods:
Computerised physician order entry records of patients with physician-diagnosed SS between 1993 and 2013 from the Singapore Sjogren's Syndrome Study were retrospectively analysed for pulmonary involvement.

Results:
Among 355 patients with SS, 25 (7.0%) had pulmonary involvement of whom 23 (92%) were female, and majority Chinese (20, 80%). The mean age at diagnosis was 52 ± 13 years, and mean disease duration 8 ± 4 years. There were 13 (52.0%) with primary SS and 12 (48.0%) with secondary SS. Among patients with secondary SS, 6 (50.0%) had rheumatoid arthritis (RA), 4 (33.3%) systemic lupus erythematosus (SLE), and 2 (16.7%) SLE/systemic sclerosis overlap (SSc). The most common parenchymal manifestations were interstitial lung disease (ILD) (17), serositis (4), lung cysts (2), and nodules (2). Among patients with ILD, 9 had primary SS; 8 had secondary SS comprising RA (5), SLE (2), SLE/SSc (1), respectively. Among patients with serositis, 2 had SLE-related serositis. Pulmonary hypertension (PH) occurred in 6, of whom 4 were associated with ILD, and none from chronic thromboembolic PH.

Discussion & Conclusion:
Pulmonary manifestations in SS involving the airways, parenchyma, pleura and vasculature may be due to SS or other concomitant rheumatic diseases. ILD was the most common pulmonary manifestation of primary and secondary SS. PH was most commonly associated with ILD. Serositis, lung cysts and nodules were rare manifestations of SS in our cohort.

PP-CR-09

Hepatic and Biliary Complications Arising from DC Bead M1 (70-150 âµm) Transarterial Chemoembolisation (TACE): A Single Centre Experience

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Background & Hypothesis:
Transarterial chemoembolisation (TACE) is an established treatment for unresectable advanced hepatic tumours. Majority of trials have been performed with bead diameters of >300 µm. Smaller particles are said to have an increased risk of perisinusoidal vessel occlusion and biliary wall necrosis but better penetration and decreased premature proximal vessel occlusion. We examined the safety profile using DC Bead M1 (70-150 µm) in TACE, the current smallest available drug-eluting bead.

Methods:
Data of 32 patients who received TACE using DC Beads M1 (70-150 µm) from January 2012 to June 2014 in Tan Tock Seng Hospital were reviewed. Baseline characteristics, procedure details and complications occurring within 6 months after the last procedure were recorded.

Results:
Four patients (12.9%) developed biliary ischaemia. Two patients (6.5%) developed bilomas which remained stable in size on follow-up with no clinical manifestations and did not require further intervention. One patient developed pancreatitis 2 months postprocedure. Albumin and bilirubin remained stable pre and postprocedure. Alanine aminotransferase (AST) and aspartate aminotransferase (AST) showed transient elevation in the non-ischaemic group but persistent elevation in the ischaemic group. Alkaline phosphatase (ALP) and gamma-glutamyl transferase (GGT) were stable postprocedure in the non-ischaemic group but showed immediate and persistent elevation in the ischaemic group.

Discussion & Conclusion:
Incidence of biliary ischaemia (12.9%) using DC Beads M1 (70-150 µm) was slightly higher than reported incidence using other particles (0.5%-12%). However, these displayed no clinical manifestations and did not require further intervention. The other major complication was 1 case of acute pancreatitis. Immediate and persistent elevation of ALP and GGT is an indicator of subsequent biliary ischaemia.

PP-CR-10

Cutaneous Collagenoma in Paediatric Patients and its Diagnostic Challenges

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Background & Hypothesis:
Collagenomas are connective tissue naevi with a predominance of thickened collagen. We report a series of 3 Chinese paediatric patients who presented with an eruption of fleshy hypopigmented papules, with histological proliferation of dermal collagen. We reviewed literature on connective tissue naevi and discuss its diagnostic challenges.

Methods:
Not applicable.

Results:
Patient 1 was an 11-year-old girl, who presented with multiple hypopigmented papules on bilateral limbs. Histological examination revealed focal haphazard increase in collagen fibres in the upper dermis with fragmented elastic fibres. Patient 2 was a 4-year-old boy, who presented with increasing fleshy skin nodules. Histology was consistent with collagenoma. Patient 3 was a 7-year-old girl with increasing numbers of rubbery papules over her face, trunk and limbs. She had varicella 2 years ago and caregivers were certain they did not arise from varicella scars. Histology revealed proliferation of collagen bundles in upper dermis arranged parallel to overlying epidermis. An initial diagnosis of eruptive collagenoma was made. However, this was revised to hypertrophic scarring, as the patient was reviewed 1 year later, and there was no change in the number or appearance of the skin lesions.

Discussion & Conclusion:
Eruptive collagenomas is non-familial and present in pre-adolescent children with multiple flesh-coloured papules. Histology consists of haphazard thickening of collagen fibres in the dermis, with degeneration of elastic fibres. Varicella is also common during pre-adolescence and resultant hypertrophic scarring may be misdiagnosed as eruptive collagenomas. Histological examination and follow-up to assess the progression skin lesions are key to providing discrimination between the 2 diagnosis.

PP-CR-11

Non-Invasive Ventilation Use in the Elderly

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Background & Hypothesis:
Chronic obstructive pulmonary disease (COPD) is among the leading causes of mortality in the elderly and a primary reason for admission. This review focuses on recent studies for non-invasive ventilation use in the elderly.

Methods:
This was a literature review of non-invasive ventilation use in the elderly.

Results:
Patients with COPD are often treated at hospital, and severe patients with hypercapnia may need invasive ventilatory support. The decision is difficult due to the fact that the patients are usually very old with irreversible changes in the respiratory tract. Non-invasive ventilation, which involves the use of oxygen and air without intubation, may avoid the need of intubation, reduce hospital stay and prolong life. Weaning a COPD patient from invasive ventilation is very difficult. In these patients with poor prognostic factors, non-invasive ventilation was preferred especially in patients 80 years of age or older, because invasive ventilation is associated with high mortality and morbidity.

Discussion & Conclusion:
Questions need to be answered include: Can non-invasive ventilation be delivered at home? Another question is ethical: Is non-invasive ventilation considered appropriate and tolerable in the elderly? Does non-invasive ventilation use provide good life quality? The key to the successful application of non-invasive ventilation in the elderly is in recognising its capabilities and limitations. This also requires identification of the appropriate patient for the use of non-invasive ventilation without too much unrealistic expectation.

PP-CR-12

Difference in Distribution of Viral Respiratory Pathogens in Acute Respiratory Illness (ARI) between a Prospective Community Cohort and Inpatients in Singapore

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Background & Hypothesis:
The distribution and severity of disease from viral respiratory pathogens in Singapore is understudied. We compared viral distribution in acute respiratory infections (ARI) between a community cohort and inpatients, and evaluated 3 methods of detecting viral etiologic agents for ARI.

Methods:
Community cohort participants and inpatients with ARI symptoms had nasopharyngeal swabs taken. We used singleplex real-time polymerase chain reaction (SRT-PCR) to detect influenza A/B (FLU-A/FLU-B), and multiplex RT PCR (MRT-PCR) for panel-viruses: FLU-A/FLU-B, respiratory syncytial viruses A/B, parainfluenza viruses 1-3, human metapneumovirus, rhinovirus, adenoviruses, coronaviruses (HCoV) 229E/OC43/NL63. PathChip was then performed on samples returning negative from SRT-PCR and MRT-PCR. The inpatient viral distribution was adjusted by their recruitment probability for comparison with the community cohort.

Results:
There were 130 ARI episodes in the community cohort (n = 507) and 145 inpatients. Panel viruses were identified in 85 (65.4%) episodes for community and 70 (30.2%) for inpatients. One community episode and 7 inpatients had dual-pathogens (FLU-A+rhinovirus), (FLU-A+FLU-B [2], FLU-A+rhinovirus [3], FLU-B+RSV, FLU-B+rhinovirus), and 1 inpatient had triple pathogens (FLU-A+adenovirus+HCoV). For the community cohort, 48 (56.5%) of virus-positive episodes were rhinovirus positive, 13 (15.3%) were coronaviruses positive and 12 (14.1%) were FLU-A-positive. The main viral-infection in inpatients were: rhinovirus (12, 37.0%), FLU-A (36, 28.2%), HCoV (8, 24.7%) and FLU-B (17, 12.2%). MRT-PCR detected 91.9% of FLU-A but only 28.6% of FLU-B detected in SRT-PCR. Higher Ct values for SRT-PCR was observed in MRT-PCR-positive than MRT-PCR-negative samples (FLU-A: 34.0 vs 28.3, *P* = 0.053; FLU-B: 33.6 vs 25.2, *P* = 0.024). PathChip increased panel virus detection rate by 5.2%; 16 non-panel virus types were also detected.

Discussion & Conclusion:
Distribution of respiratory pathogens differs between cohorts. SRT-PCR detects influenza A/B viruses better than MRT-PCR; adding PathChip had marginally increased detection rates.

PP-CR-13

Actinic Prurigo in Singaporean Chinese Patients: Association of the Human Leucocyte Antigen DRB1*03:01 Allele

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Background & Hypothesis:
Actinic prurigo is an uncommon chronic pruritic photodermatoses. Its pathogenesis is poorly understood. Association of HLA alleles with actinic prurigo have been reported in Caucasians and Amerindians. However, there has so far been no reported study in Asian populations, including the Chinese. Our study was to determine if the occurrence of actinic prurigo is associated with specific HLA alleles in the Singaporean Chinese population.

Methods:
All Chinese patients with the clinical diagnosis of actinic prurigo who were treated at the photodermatology unit, National Skin Centre, Singapore from January 2002 to April 2015 were invited to participate in the study. Clinical data and phototest results were collated and HLA typing was performed on their blood.

Results:
Fourteen patients were included in this study. Actinic prurigo was mostly of adult-onset, with a male predominance and with a lack of family history. Mucosal involvement was not a feature. These features differed from previously studied actinic prurigo patients in the Caucasian populations. The frequency of DRB1*03:01 in AP patients was significantly increased compared to healthy control (43% vs 16%, $P = 0.022$, odds ratio: 3.89). Concurrently, the frequency of HLA-B*58:01-DRB1*03:01 haplotype was significantly increased in AP patients (25% vs 7%, $P = 0.004$).

Discussion & Conclusion:
HLA-DRB1*03:01 was associated with the occurrence of actinic prurigo in our cohort of Singaporean Chinese patients. This novel allelic association may possibly be utilised as a biological marker to aid in the diagnosis of actinic prurigo in our Chinese population.

PP-CR-14

Cataract Surgery in HIV Patients

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Background & Hypothesis:
The complication profile of HIV patients undergoing cataract surgery in a tertiary referral hospital was reviewed.

Methods:
A retrospective review of eyes of HIV patients who underwent cataract surgery from 2000 to 2011 in Tan Tock Seng Hospital was performed. Patient demographics, preoperative HIV management, CD4 count, visual acuity, type of cataract surgery performed, postoperative course and complications, if any, were analysed.

Results:
A total of 46 eyes from 28 patients were identified with 25 patients on antiretroviral therapy (CD4 = 201); 41.3% had no ophthalmic manifestations of HIV/AIDS while 17 eyes had quiescent cytomegalovirus retinitis(CMVR)—4 were on maintenance therapy at time of surgery. Five eyes had quiescent immune reactivation uveitis (IRU). There were 82.6% of patients who underwent phacoemulsification; and 10.9% who underwent extracapsular cataract extraction. Sixty-three percent of surgeries followed an uneventful perioperative course. Intraoperatively, 1 eye had a posterior capsule rupture with postoperative raised intraocular pressure. One eye developed new CMVR (CD4 = 19) postoperatively, while 1 eye had reactivation of previous CMVR (CD4 = 92); 1 eye experienced IRU reactivation. Two eyes with new or previous CMVR developed rhegmatogenous retinal detachments within 3 months postoperatively. Three eyes had prolonged postoperative inflammation which settled with topical steroids. There were no cases of endophthalmitis or cystoid macular edema. Postoperative improvement of at least two Snellen lines was achieved in 80.4% of eyes. Visual acuity remained at baseline in 5 eyes due to previous zone 1 CMVR.

Discussion & Conclusion:
Cataract surgery in HIV patients has outcomes similar to the general population, but their health should be optimised prior before surgery. Patients with prior CMVR may be at risk of reactivation or RD.

PP-CR-15

Long-Term Outcomes of Twenty Four Adults with Primary Immunodeficiency from a Single Centre in Singapore

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Background & Hypothesis:
Primary immunodeficiency diseases (PID) in adults are often under-recognised, resulting in a delay in diagnosis, significant morbidity and mortality. We review the long-term outcomes of adults with PID from the Tan Tock Seng Hospital PID Registry.

Methods:
Chart review of adults with PID onset at 18 years and above who were longitudinally followed up from time of diagnosis between 1 January 1989 and 1 May 2015.

Results:
There were 24 patients, 13 (54.2%) males and 11 (45.8%) females. Eighteen (75%) were Chinese, 5 (20.8%) Malay and 1 Indian. The mean age at diagnosis was 46.3 +/- 17.9 years (range, 18.4-69.1). Antibody deficiencies was most common (14 patients, 58.3%), comprising common variable immunodeficiency [CVID] (8), selective IgA deficiency (3), selective IgA with IgG2 and G4 deficiency (1), selective IgG2 and G4 deficiency (1) and hypogammaglobulinaemia (1 with ring chromosome 18). Ten (41.7%) had other PIDs, namely immunodeficiency with thymoma (8), chronic mucocutaneous candidiasis (1) and hyperIgE syndrome (1). Twelve patients had bronchiectasis and 7 (29.2%) had chronic sinusitis at diagnosis. Seronegative arthritis developed in 2 patients. SLE predated selective IgA deficiency in 1. There were 7 (29.2%) deaths; 4 had bronchiectasis at diagnosis and died from chronic respiratory failure with or without pneumonia despite regular IVIG. A CVID patient, irregular with IVIG replacement, died from *Elizabethkingia meningoseptica* bacteraemia following consumption of frogs. Two who died had thymoma and immunodeficiency; one from metastatic thymoma and the other from multiple infections associated with T-cell defects.

Discussion & Conclusion:
The spectrum of PID patients managed is as reported elsewhere. Many of our patients present late with established sinopulmonary complications which contributed to their death.

PP-CR-16

Metabolic Syndrome (MetS) and its Association with Sarcopenic Obesity (SO)

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Background & Hypothesis:
Accumulation of visceral fat mass with aging in SO has been shown to increase the risk of hypertension, hyperlipidaemia and diabetes mellitus. Few studies have been done comparing MetS and SO. Hence, we aim to examine their association.

Methods:
We performed a cross-sectional study of 124 community-dwelling older adults. Sarcopenia was defined using the Asia working group definition. Obesity was defined as waist circumference >90 cm (men) or >85 cm (women). MetS was defined according to the National Cholesterol education programme adult treatment panel III. We subgrouped subjects into normal, obese, sarcopenic and SO. We compared demographics, comorbidities, medications, biochemical markers, anthropometric parameters, functional status and MetS prevalence between the 4 subgroups.

Results:
SO subjects were older (79.8 + 6.5 vs 70.6 normal, 72.1 + 5.9 obese, 73.2 + 4.7 sarcopenia), higher hypertension prevalence (100% vs 48.9% normal, 65% obese, 51.9% sarcopenia), with metabolic derangements (lower HDL) compared to the other subgroups. Functionally, SO individuals had significantly poorer grip strength, knee extension strength and gait speed (P <0.05) compared to other subgroups. The prevalence of MetS was 51.1% in normal, 85% in obese, 29.6% in sarcopenia and 83.3% in SO subjects (P = 0.000). For MetS, there were significant differences in functional measures on short physical performance battery and chairstand test. No significant differences were noted in lean muscle mass, strength measurements and gait speed.

Discussion & Conclusion:
MetS appears to be associated with SO. However, while SO directly impacted strength and gait speed, these differences were not noted in MetS, suggesting that the pathogenic mechanism of SO might go beyond the influence of MetS alone.

PP-CR-17

Treatment of Severe, Disabling Spasticity with Continuous Intrathecal Baclofen Therapy (ITB) following Acquired Brain Injury: An Experience of a Tertiary Institution in Singapore

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Background & Hypothesis:
Intrathecal baclofen (ITB) therapy is a proven, effective treatment for disabling cortical spasticity. We describe the first local series of 5 patients with acquired brain injury (ABI) who received ITB with a mean follow up of ~63.8 months.

Methods:
A retrospective review of medical and rehabilitation records of patients who received ITB therapy was carried out. Data studied included baseline demographic and injury variables, implantation data, spasticity and function, ITB dose over time and complications.

Results:
From 2006 to 2010, a total of 5 subjects received ITB therapy via implanted pumps at ~39.4 months post-ABI. Eighty percent experienced significant reductions in their lower limb spasticity scores and improvements in global function and dependency. Twenty percent had minor adverse events including baclofen-related sedation. The mean ITB dose at 1 year was 182.7 mcg/day (SD 65.6 mcg/day).

Discussion & Conclusion:
Our preliminary study shows encouraging long-term outcomes and safety for ITB therapy for post-ABI-related intractable spasticity. Individual ITB responses over time were variable with gender differences. The outcomes experienced by our centre were comparable to those in the general ABI population, supporting the efficacy ITB therapy for chronic disabling spasticity.

PP-CR-18

Interruption of Tuberculosis Treatment Due to Drug-Induced Liver Injury

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Background & Hypothesis:
Drug-induced liver injury (DILI) is a well recognised adverse drug reaction during tuberculosis (TB) treatment. The reported risk factors included chronic liver disease, increasing age and active alcohol use. We aim to compare patients, with and without hepatitis B/C positivity, whose TB treatment were interrupted by DILI.

Methods:
A retrospective cohort study of 2030 notified TB patients treated at the TB Control Unit in 2014 who had treatment interruption.

Results
A total of 75/2030 (3.7%) patients had TB treatment interrupted due to DILI; 24/75 (32.0%) had underlying chronic liver disease and 16/24 (66.7%) were hepatitis B or C positive (hepB/C+). The median time to treatment interruption/DILI was 5 (range, 1-33) weeks for DILI patients without vs 9 (range, 2-22) weeks for DILI with hepB/C+ ($P = 0.06$). The median maximum ALT/AST was 173/162 U/L vs 327/246 U/L; and the median time to return of liver enzymes to baseline was 3 weeks vs 5 weeks in those DILI without and with hepB/C+, respectively. More patients without hepB/C+ recovered their liver function in ≤4 weeks (60.6% vs 14.3%, $P = 0.03$). DILI patients without [33/51 (64.7%)] vs [12/16 (75%)] with hepB/C+ have completed their treatment ($P = 0.44$); of whom 19/33 (57.6%) vs 7/12 (58.3%) did so in ≤9 months. There was no difference in the adjusted treatment regimens when treatment was re-introduced in patients with DILI without/with hepB/C+.

Discussion & Conclusion:
There was no significant difference in the treatment and outcome of DILI patients who were hepB/C+. Re-introduction of anti-TB drugs after DILI can be pursued in the usual manner even in those who were hepB/C+.

PP-CR-19

Rapid Establishment of a Satellite Laboratory to Support the Management of Suspect or Confirmed Cases of Ebola Viral Disease (EVD) in a National Referral Centre

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Background & Hypothesis:
In July 2014, the rapidly evolving outbreak of EVD in West Africa caught the attention of the world and hospitals initiated preparations for investigating suspect cases of EVD. This hospital was designated as the sole referral centre for the management of such cases in Singapore and required supportive laboratory services for this purpose.

Methods:
As the possibility of a suspect case arriving at our emergency department was real and since there was no biosafety-level 3 facility in this laboratory, a quick alternative had to be improvised. The fundamental principle was to ensure that appropriate investigations were done without compromising staff safety. Staff expectations and uncertainty too had to be managed. Funding and point-of-care equipment had to be sourced.

Results:
Staff were periodically updated on the evolving outbreak and measures taken in this hospital to contain risks. Using local government guidelines, 2 negative pressure ICU rooms were identified for laboratory use; biosafety cabinets, equipment and consumables were sourced, evaluated and installed, with risk assessment done for each procedure. Staff were trained to use appropriate personal protective equipment and cross-trained to handle a small menu of tests. Specimen transport and laboratory disinfection procedures were standardised.

Discussion & Conclusion:
The steep learning curve in the implementation of this satellite laboratory with enhanced safety and a small test menu could be useful for assisting other hospitals in this country in setting up similar satellite laboratories. We hope that the lessons learnt would also be useful in the planning of a laboratory in the proposed dedicated infectious disease hospital.

PP-CR-20

Return to Riding after Motorcycle Orthopaedic Injuries: A Cross-Sectional Survey

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Background & Hypothesis:
Motorcyclists involved in road traffic accidents form a significant proportion of hospital caseload. Twenty-seven percent of these patients return to riding based on available literature. We look at the rate of return to riding of motorcyclists with orthopaedic injuries and the factors associated with this. Our hypothesis is that only a small proportion of motorcyclists return to riding.

Methods:
We did a retrospective study utilising our trauma database to identify motorcyclists with orthopaedic injuries. A phone questionnaire was completed collecting data on demographics and factors that could affect their return to riding.

Results:
A total of 192 motorcyclists were included in the study with a response rate of 98 (51%). Forty-eight (49%) were back on their motorcycle at the time of the interview. Significance testing to assess for correlation between return to riding and the parameters collected (level of employment, level of education, license type, ongoing insurance claim/legal case, open fracture, ethnicity) did not show any significance.

Discussion & Conclusion:
The number of motorcyclists returning to riding after an orthopaedic injury is about 49% which is higher than expected. The higher than expected rates could be due to several unique local factors. Riding a motorcycle might be a main source of income whereas it is considered more recreational in other developed countries. Motorcyclists used to the flexibility of riding motorcycles are likely to return to riding if they do not wish to rely on public transport. Cost of car ownership is high and modifications to motorcycles despite being expensive appear relatively affordable.

PP-CR-21

Outcome of Patients with ICU Length of Stay 30 Days and Greater: A Retrospective Study

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Background & Hypothesis:
With the rapid advances in medical technology, the practice of intensive care has been able to treat and prolong the lives of the patients after their acute illnesses. However, this also reflects an increase in patients who require longer ICU treatment. In our study, we define patients that have stayed in a ICU for more than 30 days as long stayers or chronically critical ill (CCI). We carried out a retrospective comparison of the outcomes at 90 days between CCI and the average patient in one of the government restructured hospital's surgical intensive care units admitted between 1 January 2012 to 30 June 2013. Our goal was to examine characteristics and outcomes of patients with length of stay >30 days.

Methods:
The electronic medical records of the CCI were reviewed and the following data were analysed: admission characteristics, APACHE II scores, functional status and outcomes at 30 and 90 days.

Results:
CCI made up 1.82% of total SICU admissions. Average LOS is 54.5 days whereas average ICU LOS in the control group is 5.6 days. The mean age of the CCI group is 73.5. Mortality for CCI is 26.9% vs 16% for control group. For outcome at 90 days, only 10 were discharged from hospital. Of those discharged, only 5 were discharged back home.

Discussion & Conclusion:
CCI consumed a disproportionate amount of ICU resources, with a higher mortality and morbidity as compared to the control. Their functional outcomes and quality of life are more dependent and require greater nursing needs.

PP-CR-22

A Retrospective Medical Records Review of Sputum AFB Smear-Positive Pulmonary Tuberculosis Cases with Previous Abnormal Chest Radiography

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Background & Hypothesis:
Delayed diagnosis of infectious pulmonary tuberculosis (PTB) cases contributes to the ongoing spread of disease in the community. The objective was to determine the proportion of sputum acid-fast bacillus-positive (AFB) patients with abnormal chest X-rays (CXRs) preceding their PTB diagnosis, indicating possible missed opportunities for earlier TB diagnosis; and to ascertain the circumstances around the previously abnormal CXR.

Methods:
This is a retrospective pilot study. Medical records of 52 sputum AFB smear-positive PTB patients referred to the TB Control Unit in January 2014 were reviewed. The presence (if any) of abnormal CXR in the 5 years preceding the PTB diagnosis was captured. Data collection as to the location and reasons for conducting the previous abnormal CXRs, findings whether possibility of TB was stated in the radiological report, and action taken were captured.

Results:
Of the 52 smear-positive PTB cases seen at the TBCU in January 2014, 46 were new PTB cases. CXRs were available in the 5 years preceding the PTB diagnosis in 18 patients. Of these, 10 had abnormal CXRs: 3 were symptomatic; for the rest, CXRs were done for reasons unrelated to the current episode. None of the radiological reports raised the suspicion of PTB and none (of these patients) underwent sputum AFB smear or culture.

Discussion & Conclusion:
This study shows that a high proportion of smear-positive PTB patients had prior abnormal CXR which did not trigger any investigation for PTB. Following this pilot study, a larger scaled study will be performed.

PP-CR-23

Incidence of Diabetes Mellitus in TB Patients at Tuberculosis Control Unit of Singapore and its Impact on the Clinical Presentation

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Background & Hypothesis:
Diabetes mellitus is a known risk factor for progression to active tuberculosis. Diabetics with tuberculosis are associated with more severe disease and poorer clinical outcomes compared to non-diabetics.

Methods:
We did a retrospective study of case records of all TB patients seen at the TB Control Unit (TBCU) in 2010 to determine the incidence of diabetes mellitus and the effect on the clinical presentation of TB and in these patients.

Results:
A total of 1695 patients were seen at TBCU in 2010. Among the 1027 patients who were citizens and permanent residents, 26.8% were diabetic, of whom 21.7% were newly diagnosed at the time of diagnosis of tuberculosis. The baseline median HbA1c of the known and newly diagnosed diabetics were 8.9% and 10.9%, respectively. There was no difference in the median cough duration (4 weeks vs 4 weeks) and site of disease (93.5% pulmonary disease vs 91% pulmonary disease) between the diabetics and non-diabetics respectively. Diabetics had significantly more smear positive (56.2% vs 30.1%, P <0.001), culture positive (84.6% vs 56.5%, P <0.001) and cavitary disease (33.6% vs 17.2%, P <0.001) compared to non-diabetics. Diabetics with poor control (HbA1c>7%) had significantly higher rate of smear positivity (65.1% vs 40.5%, P = 0.02), culture positivity (89.3% vs 73.2%, P = 0.006) and cavitary lung disease (41.1% vs 9.5%, P <0.001) compared with well controlled diabetics.

Discussion & Conclusion:
There was a high incidence of diabetes mellitus in the resident TB patients seen at TBCU. Diabetics had significantly more bacteriological positive and cavitary disease at presentation.

PP-CR-24

Fasting Afternoon Glucose Samples – Are They Reliable?

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Background & Hypothesis:
It is important to differentiate between random and fasting glucose specimens for correct interpretation. This study examined whether the glucose concentrations of outpatient fasting specimens collected in the afternoon are lower than afternoon random samples as evidence of true fasting status.

Methods:
Anonymised details, including collection time, of all fasting and random glucose requests on outpatients collected over 4 months were extracted from the laboratory information system for analysis in Microsoft Excel and Access. All glucose measurements were performed on Becton Dickinson SSTII gel tubes using Beckman Coulter DxC 800 chemistry analysers.

Results:
There were 8198 random and 1332 fasting glucose samples on outpatients collected between 7 h to 18 h. The percentage of random and fasting samples collected from 7 h to 10 h was 40% and 90% and from 15 h to 18 h was 20% and 0.7%. The median glucose concentrations (mmol/L) were random glucose 7 h to 10 h: 6.1; fasting glucose 7 h to 10 h: 5.9; random glucose 15 h to 18 h: 5.9; fasting glucose 15 h to 18 h: 5.35. Using median tests, median glucose concentration for fasting 7 h to 10 h samples was lower than random 7 h to 10 h samples and median for fasting 15 h to 18 h samples was lower than random 15 h to 18 h samples. Similarly median glucose concentration for fasting 15 h to 18 h samples was less than fasting 7 h to 10 h samples while median for random 15 h to 18 h samples was lower than random 7 h to 10 h (P <0.0001 to 0.0013).

Discussion & Conclusion:
Both fasting morning and afternoon glucose concentrations were less than equivalent timed random samples. The consistent relationship between fasting and random samples seen in morning and afternoon samples suggests that afternoon fasting samples are indeed fasting and justify separate reporting and interpretative comments.

PP-CR-25

Using Thyrotrophin Concentration to Predict Hyperlipidaemia

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Background & Hypothesis:
Some authorities favour lowering the upper limit for serum thyrotrophin (TSH) to 2.5-3.0 mIU/L. This study examined the influence of TSH on lipid concentrations as well as the prevalence of subclinical hypothyroidism (SCH) anticipated at the different cutoffs.

Methods:
Anonymised details of simultaneous TSH and lipid measurements (LDL-C calculated) were extracted from the laboratory database. All measurements were performed on Beckman Coulter DxC 800 and DxI 800 clinical chemistry analysers. The locally derived non-parametric reference interval for serum TSH based on anti-TPO negative individuals is 0.45-3.81 mIU/L.

Results:
There were 5851 records: 49% male, median age 45 years. Three groups were examined: 1) TSH (mIU/L) 0.45-2.5; n = 4751; 2) TSH 2.5-3.0; n = 395; and 3) TSH 3.0-3.81; n = 289. The mean, median and SD for groups 1/2/3 in order were: cholesterol (mmol/L): 5.5/5.4/5.4, 5.4/5.3/5.4, 1.0/0.9/1.0; LDL-C (mmol/L): 3.5/3.5/3.5, 3.5/3.5/3.5, 0.9/0.8/0.9; HDL-C (mmol/L): 1.3/1.4/1.4, 1.3/1.3/1.3, 0.4/0.4/0.4; triglyceride (mmol/L): 1.2/1.1/1.2, 1.0/1.0/1.0, 0.9/0.7/1.0. Multivariable linear regression controlling for age and sex showed higher analyte concentrations for Group 2 vs 1 for cholesterol (0.136 mmol/L, p 0.01), LDL-C (0.098 mmol/L, p 0.03), triglyceride (0.149 mmol/L, p 0.001). The prevalence of SCH would be: 17% (TSH 2.5 mIU/L), 10.4% (3), 5.6% (3.81), 4.8% (4); 1.1% (10).

Discussion & Conclusion:
There are statistically significant but clinically trivial higher cholesterol, LDL-C and triglycerides in individuals with higher TSH concentrations within the reference interval. Lowering the URL to 2.5-3 mIU/L would increase the prevalence of SCH 2 to 3 fold. Given the huge increase in the prevalence of SCH with a lower URL, reducing the URL is not recommended.

PP-CR-26

Gamma Globulin Interference in Serology Testing

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Background & Hypothesis:
Intravenous immunoglobulin is used in a variety of conditions, including immunodeficiency, ITP and Kawasaki disease. With a half-life of 40 days, its in vitro effect on serology tests may be overlooked, leading to false positive results and misdiagnosis. This study examined the effect of 3 different pharmacological concentrations of Intragam P (Singapore) on anti-hepatitis C total, anti-toxoplasma IgG and anti-HIV combi assay results using the Roche e601 immunoassay system.

Methods:
Three different concentrations of Intragam P (stock concentration 60 g/L) were prepared in saline to simulate the range of 0.6-2 g/kg used in clinical practice, and IgG concentrations were measured (Beckman Coulter DxC 800, immunoturbidimetry). Aliquots were then analysed for anti-HCV total, anti-toxoplasma IgG and HIV PT (antigen and total antibody) on the Roche e601 analyser using manufacturer-supplied reagents (ECLIA).

Results:
The final samples had IgG concentrations of 7.7 g/L (sample A), 17g/L (B) and 26 g/L (C). The serology results were: anti-HCV and HIV PT combi both non-reactive for A, B and C; anti-toxoplasma IgG non-reactive for A but reactive with B: 80.82 IU/mL and C: 129.7 IU/mL.

Discussion & Conclusion:
Pharmacological concentrations of Intragam P can give false positive results for anti-toxoplasma IgG with the Roche e601 assay. Anti-HCV and HIV combi PT are unaffected by the presence of Intragam P. Clinicians should ideally delay serology testing 5 to 6 months following Intragam P administration to avoid false positive results.

PP-CR-27

An Epidemiological Update on the Circulating Human Rhinoviruses in Singapore

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Background & Hypothesis:
Human rhinovirus (HRV) is the most prevalent respiratory aetiological agent. More than 100 serotypes have been categorised into *HRV-A* and *HRV-B* by serotyping. Recently, *HRV-C* was discovered using molecular genotyping. Tan et al (2009) examined the epidemiology of HRVs among hospitalised children in Singapore from 2005 to 2007. This study provides an update with a validated 5'untranslated region (5'UTR) genotyping method.

Methods:
Forty-four entero/rhinovirus-positive samples were collected during 2013. A 410-bp region within the 5'UTR was amplified and bidirectionally sequenced. The sequences were tagged with ward location and admission date. A combination of BLAST and phylogeny reconstruction (minimum-evolution method with general time-reversible nucleotide substitution model) was used to perform high-confidence genotype calling. To ascertain the accuracy, the genotyping results on 128 reference genomes were compared between the BLAST/5'UTR and the gold standard viral protein (VP) genotyping methods.

Results:
The BLAST/5'UTR and VP genotyping showed congruent genotype assignment for all the reference genomes. Of the 44 samples, 39 were successfully sequenced. Among them, 26 (66.6%) were *HRV-A*, 3 (7.7%) were *HRV-B*, 9 (23.1%) were *HRV-C*, and 1 (2.6%) was an *Enterovirus D*. Three probable nosocomial transmissions were caused by *HRV-A28*, *HRV-A88*, and *HRV-C25*, respectively

Discussion & Conclusion:
The BLAST/5'UTR genotyping demonstrates 100% concordance against the gold standard. Consistent with earlier study, *HRV-A* is the dominant strain. Surprisingly, a predominance of *HRV-C* over *HRV-B* was observed. *HRV-A28*, *HRV-A88*, and *HRV-C25* could potentially be highly transmissible. A trivalent vaccine targeting these 3 strains may be useful to prevent future episodes of nosocomial transmission.

PP-CR-28

Prevalence and Characteristics Associated with Malnutrition in Hospitalised Elderly Patients

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Background & Hypothesis:
Malnutrition is associated with poor outcomes including mortality and prolonged hospital stay, and can be attributed to many causes, including polypharmacy and depression. The aim of this study is to determine the prevalence of malnutrition in the elderly and its association with other factors.

Methods:
The 3-Minute Nutrition Screening (3-MinNS) was performed on 235 elderly patients, above the age of 65, who were admitted to the general medicine wards over a 4-week period. The cutoff 3-MinNS scores used to identify malnourished patients and patients with severe malnutrition were 3 and 5 respectively. The case notes and electronic medical records were reviewed for polypharmacy, diagnosis of depression and dietician referral. Polypharmacy was defined as having 5 or more medications.

Results:
The age of the patients range from 65 to 104 years old; 92 (39.1%) of the patients were males and 143 (60.9%) were females. Seventy out of the 235 (29.8%) patients were malnourished, of which 21 (30%) had severe malnutrition. Of the 70 malnourished patients, 65 (92.9%) were referred to the dietician, 45 (64.3%) had polypharmacy, and 10 (14.3%) were diagnosed with depression. Six (8.6%) malnourished patients died during their admission, compared to 3 patients in the non-malnourished group.

Discussion & Conclusion:
A total of 29.8% of the elderly patients were malnourished; 92.9% of the malnourished patients were referred to the dietician, 64.3% had polypharmacy, and 14.3% had depression. In addition to a dietician referral, elderly patients should be reviewed for polypharmacy, screened for malnutrition and depression and treated appropriately.

PP-CR-29

Risk Factors Associated with Community Fallers at Six Months Postintervention

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Background & Hypothesis:
A fall is a result of interaction between multifactorial risk factors. Multifactorial intervention programmes have shown a reduction in falls and risk of falling .This study was conducted to explore the factors associated with participants who had falls 6 months after attending a community fall prevention programme.

Methods:
Serial data was collected from 730 participant during the 1-year programme. These participants underwent geriatric screening, physiotherapy and occupational therapy assessment at baseline. The intervention consisted of medical advice, exercise, education and home visits. Fall data was collected through monthly telephone calls. Univariate and multivariate analysis was done to examine the baseline demographic, medical and functional factors associated with fallers 6 months postintervention.

Results:
There were 14% fallers in the first 6 months of the programme compared to 9.2% in the second 6 months. The baseline factors associated with postintervention faller were a past history of fall, number of fall risk factors, diagnosis of OA knees, step test and 6-minute walk test was significant at (P <0.05). Multivariate analysis controlling for other risk factors only past history of fall (OR: 1.9) and diagnosis of OA knees (OR: 1.8) remains significantly associated with postintervention fallers.

Discussion & Conclusion:
The results suggest that the fall programme reduces the number of fallers after 6 months. For those remaining fallers, further attention to fall risk factors like OA knees may be important.

PP-CR-30

Comparative Risk Factors for Nosocomial New Delhi Metallo-Beta-Lactamase (NDM-1)-Producing Enterobacteriaceae and Non-Carbapenemase-Producing (NCP) Enterobacteriaceae

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Background and Hypothesis:
Carbapenem resistance occurs via 2 mechanisms: acquisition of resistance genes (NDM-1, KPC, OXA) or a combination of extended spectrum beta-lactamase production and alteration of the expression of porins (non-carbapenemase producing Enterobacteriaceae or NCP-CRE). We conducted a case control study to identify if NDM-1 Enterobacteriaceae share risk factors with NCP-CRE.

Methods:
Patients admitted for at least 48 hours between September 2010 and July 2013 were included. Case 1: patients with NDM-1 Enterobacteriaceae isolated from either clinical or surveillance cultures. Case 2: patients with NCP-CRE isolated from either clinical or surveillance cultures. Control: patients screened negative for CRE. Patients with both NDM-1 Enterobacteriaceae and NCP-CRE were excluded. Demographic, clinical, microbiological and antibiotics usage data were collected from electronic medical records. We conducted time at risk adjusted bivariate analysis followed by multivariate analysis using STATA 12.0.

Results:
A total of 1934 patients were screened for CRE. A total of 40 NDM-1 Enterobacteriaceae and 43 NCP-CRE patients were compared with 61 randomly selected control patients. There was no significant difference in age, sex and Charlson index between cases and controls. Independent risk factor for NDM-1 Enterobacteriaceae was intensive care unit (ICU) admission in the preceding 3 months (OR: 3.2; 95% CI, 1.2- 8.6; *P* = 0.02) and for NCP-CRE was number of days exposed to carbapenems (OR: 1.2; 95% CI, 1.1-1.3; *P* = 0.002).

Discussion & Conclusion:
NDM-1 Enterobacteriaceae and NCP-CRE do not share similar risk factors in this small single center study. This finding has an implication on infection control strategies for CRE control.

PP-CR-31

Impact of Anti-Tubercular and Corticosteroid Therapy in Patients with Presumed Ocular Tuberculosis at a Tertiary Referral Eye Care Centre in Singapore

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Background & Hypothesis:
We aim to: 1) evaluate the demographics and clinical features of patients with presumed intraocular tuberculosis (IOTB) in Singapore; 2) analyse the treatment outcome of patients on anti-tubercular (ATT) and corticosteroid therapy; and 3) determine the factors affecting treatment outcome.

Methods:
This was a retrospective study of patients diagnosed with presumed IOTB, with a minimum follow-up of 6 months, at a tertiary referral eye care centre in Singapore between 2005 and 2014. Our main outcome measure was recurrence of inflammation and tapering of oral corticosteroids.

Results:
Of the 2000 cases screened, 49 patients, with mean age 45.69 years and male gender 57.14% were included in the study. Clinical features revealed bilateral involvement in 34.69%, with panuveitis and anterior uveitis being the most common presentations. Out of the 49 patients, 40.82% did not receive ATT while 59.18% did, in which most received at least 6 months of treatment. A total of 86.96% and 34.69% patients received topical and systemic corticosteroid respectively, either concurrently with ATT or by itself. Bivariate analysis revealed gender ($P = 0.057$), race ($P = 0.02$), and the use of oral steroids ($P = 0.049$) as factors leading to treatment failure. However, multivariate analysis did not reveal any single covariate affecting treatment outcome.

Discussion & Conclusion:
We conclude that ATT with/without corticosteroid may help improve treatment success in patients with presumed IOTB. However, we note that systemic steroids may adversely affect treatment outcome in patients who are on ATT. A large scale, multicentre, prospective study is advised to devise an appropriate treatment guideline for IOTB.

PP-CR-32

Anti-Tubercular Therapy for Intraocular Tuberculosis: Systematic Review

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Background & Hypothesis:
There is a diagnostic and treatment dilemma in the management of intraocular tuberculosis (IOTB). We aim to gather evidence based on published literature on the efficacy of anti-tubercular therapy (ATT) on patients with IOTB, and analyse the factors affecting treatment outcome.

Methods:
This is a systematic review examining ATT use and its outcome on IOTB. Upon selection of articles using a predetermined selection criteria, data concerning the demographics, clinical features, diagnostic modalities, treatment regimen and its outcome were extracted.

Results:
Of the 1411 records identified through the database, 28 full text articles were included in our review. A total of 1917 patients were reported, with sample size and mean/median age ranging from 10 to 343 and from 21.7 to 66.0 years respectively. The ATT regimen used varied amongst the different studies, with most centres following the standard 4-drug regimen with isoniazid, rifampicin, ethambutol and pyrazinamide. The use of ATT generally resulted in successful outcome in most patients (80.2%). However, African ethnicity, age >50 years, female gender, longer duration of uveitis, delay in diagnosis >500 days, presence of intermediate/posterior uveitis/panuveitis, higher median QuantiFERON-TB Gold values and administration of corticosteroid therapy and immunosuppressants were associated with worse treatment outcome.

Discussion & Conclusion:
Administration of ATT is generally associated with successful treatment outcome, and thus is recommended for patients with presumed IOTB. Current drug regimen used for treatment of pulmonary or extrapulmonary TB may be adopted for that of IOTB. However, more studies need to be undertaken to formulate a treatment guideline for IOTB.

PP-CR-33

Psychological Distress, Quality of Life and Functional Gains among the Spinal Cord Injured

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Background & Hypothesis:
Spinal cord injury (SCI), although relatively uncommon, can have potentially devastating physical and psychological effects. Severe disability and psychological distress are known to contribute to poor quality of life. This study aims to: 1) describe the demographics and psychological morbidity in a group of patients receiving inpatient rehabilitation in Singapore and follow them up over a period of one year; 2) describe their perceived quality of life; and 3) understand the impact of these factors on functional recovery.

Methods:
Data was collected at 5 time points from index admission for inpatient rehabilitation: 1) within 1 week (T0); 2) 1 month/at discharge (T1); 3) 3 months (T2); 4) 6 months (T3); and 5) 1 year (T4). The Hospital Anxiety and Depression Scale (HADS), Euro-Quality of Life Scale (EQ-5D) and Functional Independence Measure were administered.

Results:
This is an ongoing prospective cohort study, and results of the first 6 months of follow-up are presented. Levels of anxiety were as high as 29.3% and depression 19.5% in the first 6 months following admission for inpatient rehabilitation. Quality of life declined over time despite improving functional scores. Pain was an area that those who screened positive struggled with.

Discussion & Conclusion:
Psychological distress was high in individuals following spinal cord injury with poorer quality of life, and remained so in a significant minority up to 6 months postadmission. Screening programmes and early structured interventions may be useful in improving the quality of life for SCI patients through helping them cope with pain and psychological distress.

PP-CR-34

Preoperative Predictors of Outcomes of Orbital Floor Fracture Repair

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Background & Hypothesis:
Orbital floor fracture is a common injury sustained after blunt force impact to the orbit. Although consequences of orbital floor fractures have been well studied, outcomes of surgical repair to ameliorate complications such as enophthalmos and diplopia have not been systematically analysed. Our study aims to investigate for preoperative predictors of favourable surgical outcomes.

Methods:
Retrospective review of 59 consecutive cases of orbital floor fractures that underwent orbital floor repair between January 2000 to December 2009 from the Department of Ophthalmology, Tan Tock Seng Hospital, Singapore. Significant enophthalmos (greater than 2 mm on Hertel's exophthalmometer), significant diplopia (objective diplopia within 30 degrees of primary gaze on binocular single vision test), extensive fracture (greater than 50% on computer tomography) and muscle entrapment (examined intraoperatively) were analysed at presentation, 1 week (POW1) and 6 months (POM6) postrepair.

Results:
Subjects with significant enophthalmos preoperatively were 4.7 times more likely to have significant enophthalmos at POM6 (P <0.01). Fracture extent was not associated with postoperative enophthalmos at POM6 (P = 0.5). Subjects with preoperative diplopia were 1.5 times more likely to have significant diplopia at POM6 (P = 0.3). Postoperatively, significant diplopia and significant enophthalmos reduced by 57% (n = 17/30) and 53% (n = 9/17) at POM 6 respectively, although this was not statistically significant. On multivariate analysis, surgery for muscle entrapment was significantly associated with surgical success at POM6 (P = 0.03).

Discussion & Conclusion:
Presence of enophthalmos and diplopia preoperatively predicted for a higher risk of these complications postoperatively. Orbital floor fracture repair provided modest reduction of significant diplopia and enopthalmos.

PP-CR-35

Discrepancies in Assessing Anterior Chamber Activity amongst Uveitis Specialists

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Background & Hypothesis:
The assessment of anterior chamber (AC) activity is essential to any ophthalmic exam. However, the practice of examining AC activity remains varied. In this study, we aim to evaluate current practices of AC inflammation assessment amongst uveitis specialists.

Methods:
Uveitis specialists were invited to participate in an electronic survey to understand their practice in assessing AC inflammation.

Results:
A total of 65 ophthalmologists participated in the survey; 69.2% (n = 45) reported using the current Standardization of Uveitis Nomenclature (SUN) guidelines (1 mm x 1 mm slit beam). Only 38.5% (n = 25) routinely counted the number of cells. Although 98.5% (n = 64) valued the assessment of flare, 84.6% (n = 55) did not use laser flare photometry. There were 36.9% (n = 24) who agreed that laser flare photometry would change their management, while 16.9% (n = 11) did not see its usefulness. The remaining participants were undecided.

Discussion & Conclusion:
Different classifications in grading AC activity are still being used despite efforts to standardise practice. The use of flare is an area of controversy in uveitis. Although laser flare photometry is an accurate and consistent method to assess AC flare, it is still not widely utilised.

PP-CR-36

Heterogeneity of Joint Deformity in Rheumatoid Arthritis Revealed by Cluster Analysis

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Background & Hypothesis:
Statistical clustering methods applied to clinical diseases may have prognostic implications. We aim to examine the joint deformity cluster pattern in a rheumatoid arthritis (RA) inception cohort.

Methods:
All patients fulfilled the 1987 ACR criteria for RA, had <2 years disease duration at recruitment were followed up till 2014. Joint deformity among the 8 joints at the last study visit was analysed using eigen vectors from principal component analysis. K-means clustering analysis was applied to classify the RA subgroups based on distribution of joint deformity. Joint deformity pattern was analysed at the last visit and correlated with clinical and serological factors.

Results:
The mean age of the RA cohort was 50.4 years, 75.5% were Chinese and the mean follow-up period was 88.4 months. Correlation analysis showed 3 categories of joint deformity: proximal interphalangeal/metacarpophalangeal joint (PIP/MCP), shoulder/elbow/ankle (S/E/A) and wrist/knee/metatasophalangeal (W/K/MTP). Cluster analysis showed 4 patterns of joint deformity: mild involvement of PIP/MCP joints (group I), dominant involvement of S/E/A and W/K/MTP (group II), W/K/MTP involvement (group III) and dominant PIP/MCP/S/E/A/W/K/MTP involvement (group IV). There was no significant difference in mean age, disease duration, clinical activity, functional status and prevalence of rheumatoid factor and anticyclic citrullinated antibody. Group IV patients had significantly longer symptom duration and more radiographic erosions (P <0.05). Unlike other joints, wrist deformity was significantly correlated with prior wrist tenderness or swelling (34.5% of patients).

Discussion & Conclusion:
Cluster analysis showed 4 subgroups of RA patients based on pattern of joint deformity. The presence of baseline wrist synovitis may predict wrist deformity.

PP-CR-37

Anti-Inflammatory Properties of Common Acne Products in Singapore

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Background & Hypothesis:
Acne is a common problem during adolescence and young adulthood, and most young people will try commercially available acne products. Non-medical ingredients are often used in these products, some of which may be effective against acne or may exacerbate the situation. We should be aware of the variety of commonly available acne products and their active ingredients in order to better advise patients. Thus this project was done to explore the active ingredients in common acne products in Singapore and their effectiveness against acne.

Methods:
Convenience sampling of 2 supermarkets and 2 retail pharmacies was conducted. All products which contained the word "acne" on the packaging (excluding the brand name) were included. Ingredient lists on the products' packaging were checked against a list of 17 anti-inflammatory ingredients and any additional "active ingredients" were also recorded.

Results:
A total of 46 acne products were identified. More products were available in the retail pharmacies (82.6%) than the supermarkets (65.2%), and many products contained at least 1 anti-inflammatory ingredient (71.7%). The most common anti-inflammatory ingredients were salicylic acid (30.4%), benzoyl peroxide (17.4%), green tea (15.2%), aloe vera (10.9%) and witch hazel (10.9%). Other "active ingredients" included o-Cymen-5-ol (19.6%), triclosan/triclocarban (15.2%), sulfur (8.7%), magnolia bark (8.7%), oleanolic acid (4.35%), glycolic acid (2.17%), mandelic acid (2.17%) and resorcinol (2.17%).

Discussion & Conclusion:
Common acne products in Singapore contain a variety of anti-inflammatories, antimicrobials and superficial peels. However, frequently, the concentrations of the antimicrobial and anti-inflammatory agents are not stated, and there may be irritant or comedogenic compounds in the acne products.

PP-CR-38

Duration of Cough in Smear-Positive Pulmonary Tuberculosis Cases in Singapore, 2002 to 2014

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Background & Hypothesis:
Singapore's TB incidence rate among citizens and permanent residents (PRs) and long-term stayers increased from 35 per 100,000 population in 2007 to 40.3 per 100,000 population in 2008. It has since remained at between 37 to 42 per 100,000 population. We hypothesised that this increase was partly contributed by community transmission resulting from delayed diagnosis of infectious pulmonary TB (PTB) cases.

Methods:
We analysed the trend of sputum acid-fast bacilli (AFB) smear-positive PTB patients notified to the TB Registry with cough, and the cough duration prior to diagnosis of TB among citizens, PRs and long-term stayers between 2002 and 2014. Cough for >8 weeks was considered as a marker of delayed diagnosis.

Results:
Between 2002 and 2014, 80% to 85% of smear-positive PTB cases had cough. Among these, 21% to 32% had cough duration >8 weeks and 6% to 8% had cough duration >24 weeks. The number and proportion of smear-positive PTB patients who presented with cough duration >8 weeks increased from 140 (21.2%) in 2004 to 196 (30.5%) in 2014. Similarly, the number and proportion of smear-positive cases with cough duration >24 weeks increased from 38 (5.8%) in 2004 to 55 (8.6%) in 2014.

Discussion & Conclusion:
Since 2004, there was an increasing trend in the number and proportion of sputum AFB smear-positive PTB patients who were notified with cough >8 weeks duration. This delayed diagnosis may have contributed to the increase in TB incidence rate among citizens, PRs and long-term stayers.

PP-CR-39

The Effect of Intralesional Fat Content on the Sonographic Visibility of Small Hepatocellular Carcinomas during Ultrasound-Guided Radiofrequency Ablation: A Retrospective Study

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Background & Hypothesis:
The feasibility of ultrasound-guided radiofrequency ablation of small hepatocellular carcinomas (<3 cm in size) is dependent on lesional visibility, which in turn is influenced by various factors. This study thus aims to assess the effect of intralesional fat on the sonographic visibility of small hepatocellular carcinomas (HCC) during radiofrequency ablation. Fatty liver, cirrhosis, lesional size and distance from diaphragm were evaluated as well.

Methods:
Patients referred for ultrasound-guided radiofrequency ablation from January 2010 to April 2015 were included in this study, if they had a new case of HCC, or new foci after prior treatment. Patients undergoing simultaneous treatment (e.g. RFA-TACE), being treated for residual disease, or underwent CT-guided RFA without planning ultrasound scans were excluded. The presence of intralesional fat (MRI-determined fat fraction >5%) was determined retrospectively via in-and-out of phase imaging on MRI scan.

Results:
A total of 97 cases (16 women, mean age 68.11 [SD ± 11.03]) were included in the study out of 246 potential cases. The overall detection rate was 77.3% (75/97). The number of lesions containing fat was 27.8% (27/97). On analysis, intralesional fat was found to have a significantly positive effect ($P = 0.004$) on visibility. Distance from the diaphragm was also found to significantly affect visibility ($P = 0.0099$). In this series, lesional size ($P = 0.128$), background fatty liver, presence of cirrhosis and the lesion's location were not significant in predicting the visibility of the lesion on ultrasound.

Discussion & Conclusion:
The presence of intralesional fat and distance of the lesion from the diaphragm were found to have a significant effect on visibility.

PP-CR-40

Association of Ethnicity, Inflammation and Obesity in Multiethnic Asians with Type 2 Diabetes and Preserved Renal Function

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Background & Hypothesis:
Obesity is associated with elevated systemic inflammation and increased risk for cardiovascular disease (CVD). Our earlier studies showed that Malays and Indians with type 2 diabetes (T2DM) had higher CVD risk as compared to Chinese but the underlying mechanisms remain incompletely understood. We aim to study the relationship of ethnicity, systemic inflammation (C-reactive protein (CRP) as a biomarker) and obesity in multiethnic Asians with T2DM.

Methods:
A total of 1467 T2DM subjects with CKD-EPI eGFR $\geq$60 mL/min/1.73 m^2 were included in this study. Plasma high-sensitivity CRP (hs-CRP) was quantified by ELISA.

Results:
The proportion of Chinese, Malays and Indians was 55%, 21% and 24%, respectively. Hs-CRP concentration was significantly higher in Malay (2.0 (0.7-4.1) µg/mL) and Indian (2.8 (1.1-4.7) µg/mL) as compared with Chinese (1.3 (0.4-3.0) µg/mL, *P* <0.0001). Malays and Indians had higher BMI (Malays 29.5 ± 5.6, Indians 27.5 ± 4.5 and Chinese 26.3 ± 4.4 kg/m^2, *P* <0.0001) and greater waist circumference (Malays 99.2 ± 14.2, Indians 97.8 ± 12.1 and Chinese 93.1 ± 12 cm, *P* <0.0001) than Chinese. Bivariate correlation showed that hs-CRP was positively correlated with BMI (Ï = 0.385, *P* <0.0001) and waist circumference (Ï = 0.372, *P* <0.0001). Interestingly, general linear model revealed that the differences in hs-CRP levels between Malay and Chinese were weakened after adjusting for either BMI or waist circumference whereas the difference in hs-CRP levels between Chinese and Indian was not significantly altered.

Discussion & Conclusion:
High systemic inflammation in Malays and Indians with T2DM may partly explain their high CVD risk. The increased levels of inflammation in Malays may be attributed to obesity. However, the mechanism underlying high inflammation in Indians remains to be elucidated.

PP-CR-41

Soundproofing the Sleep Laboratory

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Background & Hypothesis:
Sleep laboratory should conform to the industry's standard in noise isolation to create a conducive environment for sleep testing. However, major guidelines for sleep laboratory accreditation fail to address the optimal level of noise isolation for sleep testing.

Methods:
Based on previous studies on noise in hospital wards, sleep laboratories and our centre's experience, we identified a list of common noises that present in our sleep laboratory. We simulated these noises and measured their levels within our sleep facility.

Results:
We demonstrated the level of noise produced by events and objects commonly occurring in or found in and around the sleep laboratory. Ambient noise was recorded at 23 dB(A) which is significantly lower than acceptable international standards.

Discussion & Conclusion:
This experiment identified the common noises encountered in the setting of a sleep laboratory. We hope that our results can provide a reference to future in-house, remote or home sleep testing locations' acoustic planning.

PP-CR-42

Comparison between Valuation-Derived and Mapping-Derived EQ-5D-5L Index Scores

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Background & Hypothesis:
Utility values of EQ-5D-5L health states derived from valuation studies (valuation-derived) have not been available. The only current method for deriving the utility-based EQ-5D-5L index score is a mapping function (mapping-derived) using existing EQ-5D-3L utility values. This study aimed to compare these 2 indices.

Methods:
This was an observational study of 269 breast cancer patients whose EQ-5D-5L index scores were derived from both methods. For comparing discriminatory ability and responsiveness to change, bivariate regression models were used to estimate the effect sizes of various health indicators on the index scores. Agreement and test-retest reliability were examined using intraclass correlation coefficient (ICC). The 90% confidence interval (90% CI) was compared to a predefined equivalence margin whenever appropriate.

Results:
The mean difference and ICC between the 2 index scores were 0.015 (90% CI, 0.006 to 0.024) and 0.915, respectively. The scores were equivalent in 6 of 8 comparisons for discriminative ability and in all comparisons for responsiveness to change. However, the mapping-derived index score was lower than the valuation-derived index score in patients experiencing extreme health problems, and the test-retest reliability of the former was lower than the latter, for example, their ICCs differed by 0.121 (90% CI, 0.051 to 0.198) in patients who reported no change in performance status in the follow-up survey.

Discussion & Conclusion:
This study provided the first evidence supporting the validity of the mapping function for converting EQ-5D-5L profile data into a utility-based index score. We caution the use of this mapping function in very ill populations.

PP-CR-43

Literature Review and a Case of Tracheal Stenosis after a Very Brief Intubation

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Background & Hypothesis:
Tracheal stenosis postintubation is a well known complication of endotracheal intubation and tracheostomy. Prolonged intubation is postulated as one of the many risk factors for postintubation tracheal stenosis (PITS). There exist only a few case reports on PITS for patients intubated for less than 48 hours.

Methods:
We present a case of PITS after a very brief (<48 hours) intubation and conduct a literature review of similar cases.

Results:
We summarise, in a table form, the similarities between our patient and those reported in other case reports of this rare complication.

Discussion & Conclusion:
Our case, among few others reported, illustrated that PITS can develop after a very short intubation and susceptible patients had similar characteristics.

PP-CR-44

Incidence of Complications Requiring Intervention during Chemotherapy for Metastatic Colorectal Cancer: A Single Institution Study

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Background & Hypothesis:
Approximately 25% of colorectal cancer patients have distal metastasis at presentation. Twenty percent of them will undergo emergency surgery upfront. Those with minimal symptoms may undergo chemotherapy first. However, complications may occur during chemotherapy. We aim to evaluate the incidence and associated risk factors for complications requiring intervention during chemotherapy.

Methods:
Stage IV metastatic colorectal carcinoma patients who were diagnosed from 1 January 2006 to 31 December 2013 were identified from a prospectively maintained database. Patients who were not suitable for chemotherapy, who underwent surgery before commencement of chemotherapy or radiotherapy or loss to follow-up were excluded.

Results:
From January 2006 to December 2013, 213 patients were diagnosed with metastatic colorectal cancer. Sixty (28.2%) underwent upfront chemotherapy. Of these, 16 patients (26.7%) subsequently required intervention for primary tumour-related complications. Compared to those without primary tumour complications during chemotherapy, there were more circumferential tumours and tumours which were unable to be traversed during endoscopy.

Discussion & Conclusion:
Intestinal complication rates in patients with metastatic colorectal cancer undergoing chemotherapy have been reported to be in the range of 4% to 13.4%. Our results of 26.7% suggest a possible higher complication rate during chemotherapy. Possible explanations are that of tumourlysis during chemotherapy, resulting in perforation, oedema and obstruction, or an inherent aggressive tumour biology. Nonetheless, their occurrences can disrupt the course of chemotherapy and its potential benefits. Furthermore, emergency surgery during chemotherapy is associated with higher morbidity. In conclusion, circumferential tumours and failure to traverse at first endoscopy are associated with increased risk of complications.

PP-CR-45

The Effect of Externalising Problems on Happiness in Children with Disruptive Behaviour Disorders

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Background & Hypothesis:
Life outcomes have often been shown to have an impact on a person's happiness. However, happiness research looking at clinical populations remains the minority. Hence, this study aims to investigate the effect of externalising problems on happiness in children with disruptive behaviour.

Methods:
A total of 119 children aged 11 to 16 years old (M = 12.46, SD = 1.35) with a diagnosis of attention deficit hyperactivity disorder (ADHD) and/or oppositional defiant disorder (ODD)/conduct disorder (CD) using the DSM-IV-TR criteria and their parent(s) were recruited. Children completed the Subjective Happiness Scale (SHS) and the Youth Self-report (YSR); parent(s) completed the Child Behaviour Checklist (CBCL). Externalising problems were measured by the rule-breaking behaviour and aggressive behaviour subscales in the YSR and CBCL.

Results:
A linear regression analysis was conducted to examine the effects of externalising problems while controlling for the effects of age, gender and diagnosis. Interestingly, both parent-reported aggressive and rule-breaking behaviour significantly predicted happiness, whilst only child-reported rule-breaking behaviour was a predictor.

Discussion & Conclusion:
Results showed that symptom severity, in the form of externalising problems, had a negative effect on happiness. Given that parent-reports are often considered to be more objective than child-reports, it is interesting that even an objective measure of externalising problems had an impact on the child's subjective happiness, reiterating the impact of problem behaviour on happiness. As happiness is a cornerstone of well-being, it should not be neglected in therapy, especially for children with greater symptom severity. Future research can explore the effects of problem behaviour on happiness over time.

PP-CR-46

Occult Acetabular Fractures: A Report of 4 Cases and Review of Literature

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Background & Hypothesis:
Acetabular fractures are uncommon and usually result from high-impact trauma. Occult acetabular fractures are rare but can result from low-energy trauma in patients with osteoporosis. Further imaging should be performed in patients who present with persistent hip pain despite normal radiographs.

Methods:
This is a report of 4 cases of occult acetabular fractures and a review of the existing literature.

Results:
All 4 cases presented with persistent hip pain after minor trauma. Three of the patients were elderly (65 years and above). Plain radiographs, including Judet's view, failed to detect any of the fractures in our series. MRI scans were utilised for diagnosis of occult acetabular fracture. Three of the 4 patients were treated conservatively, with 1 patient undergoing osteosynthesis. All patients were able to return to premorbid ambulation at the 6-month follow-up. Review of the literature showed 15 occult acetabular fractures in 8 published English reports. Majority of the fractures involved the anterior column. Eleven of these fractures were treated conservatively, with satisfactory outcome achieved.

Discussion & Conclusion:
Occult acetabular fractures can occur in patients with osteoporosis even after low-energy trauma. Patients with persistent hip pain and normal radiograph findings should have an MRI of their hip, which is effective in detecting occult acetabular fractures. Good functional outcomes can be achieved by either conservative or surgical treatment.

PP-CR-47

Clinical Efficacy and Safety in the Use of Polymer-Free Drug-Coated Stent in Primary Angioplasty for ST-Elevation Myocardial Infarction

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Background & Hypothesis:
The new generation of polymer-free Biolimus coated stent (BCS) may require a shorter duration of antiplatelet therapy due to early strut endothelisation. Major bleeding plays a significant role in predicting outcome postpercutaneous coronary intervention (PCI). Our aim is to assess the efficacy and safety of BCS in the treatment of ST-elevation myocardial infarction (STEMI).

Methods:
Between August 2014 to May 2015, we reviewed 91 consecutive STEMI patients who underwent primary PCI using BCS in Tan Tock Seng Hospital.

Results:
Amongst the 91 patients (92 lesions), 85.7% were males, with mean age 59 ± 12 years. Sixty percent of patient presented with anterior STEMI, with the left anterior descending artery being the most common culprit vessel (50.5%). Mean left ventricular ejection fraction was $42.2 \pm 8.9\%$; 94.5% were carried out via radial approach. Thrombectomy was performed in 48 patients (52.7%) with glycoprotein 2b/3a inhibitors administered in 64 patients (70.3%). Preprocedural thrombolysis in myocardial infarction (TIMI) flow was 0 in 78% of patients. After BCS implantation, TIMI 3 flow was restored in 98.9% of patients. At 30-day follow-up, there was 1 target vessel revascularisation due to definite stent thrombosis, 2 patients had stroke, and 1 patient had TIMI minor bleed (epistaxis). No death was reported.

Discussion & Conclusion:
The use of polymer-free BCS as primary device for STEMI patients in PPCI was feasible and associated with a high rate of final TIMI 3 flow and low 30-day major adverse cardiac event.

PP-CR-48

Common Venous Access Complications: A Pictorial Review

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Background & Hypothesis:
Vascular access devices provide valuable temporary to long-term venous access. They are used in both in and outpatient settings, allowing for easier and more comfortable administration of parenteral nutrition, long-term intravenous antibiotic and chemotherapy as well as for regular blood sampling and dialysis.

Methods:
Not applicable.

Results:
Not applicable.

Discussion & Conclusion:
Image-guided venous access is now the standard of practice in most institutions as it has shown to decrease the risk of complications compared to the landmark techniques. Before the use of ultrasound, the reported occurrence of acute adverse events ranged from between 6.3% to 11.8%. The use of imaging has significantly reduced the immediate complication rates to between 4% to 7%. In this pictorial review, we describe a range of common complications related to venous access which are still encountered and briefly discuss their management.

PP-CR-49

Prognostication and Withdrawal of Care in Patients Presenting to the Medical Intensive Care Unit Following Cardiac Arrest with Non-Shockable Rhythms

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Background & Hypothesis:
Patients who present with cardiac arrest with no shockable rhythm have a poor prognosis. We sought to elucidate the factors which influence decisions on withdrawal of care.

Methods:
A retrospective review of case sheets for 42 consecutive admissions with non-shockable cardiac arrest to a medical intensive care unit in an academic medical centre from January 2014 to May 2015. Details pertaining to patients' biodata and medical data, cardiac arrest data, neuroprognostic tests and withdrawal of care were analysed.

Results:
Of the 37 cases, the average age was 69.8 years. Nineteen were inpatient cardiac arrests and 16 were asystolic arrests. The mean duration from collapse to return of circulation was 34.56 minutes. The withdrawal of care (WOC) group had a shorter time to return spontaneous circulation (30.7 minutes) vs the non withdrawal of care (NWOC) group (39.7 minutes). The age, premorbid functional status, number of comorbid conditions, and initial rhythm similarly did not show any statistically significant difference. Myoclonic jerks were seen more commonly in the withdrawal of care group. The most commonly used technique of withdrawal of care is terminal extubation.

Discussion & Conclusion:
The duration of CPR appears to be long in both groups exceeding 30 minutes. Patients who had a more severe illness received longer CPR but succumbed to their illness more rapidly; hence did not undergo withdrawal of care. Neurological prognostication was largely clinical, with occasional neuroimaging and electrodiagnostic testing to support decisions to withdraw care.

PP-CR-50

A Review of the Management of Hidradenititis Suppurativa in Patients with Metabolic Comorbidities

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Background & Hypothesis:
Hidradenitis suppurativa is a chronic inflammatory skin condition associated with an increased prevalence of individual metabolic conditions of insulin resistance, obesity, dyslipidaemia, hypertension, and also with the metabolic syndrome as a constellation of these risk factors. This review aims to examine this association and how it impacts management.

Methods:
Using the keywords "hidradenitis suppurativa", "insulin resistance", "diabetes mellitus", "obesity", "dyslipidaemia", "hypertension", and "metabolic syndome", the authors conducted a search of English language articles in the PubMed database.

Results:
There is a clear association between hidradenitis suppurativa with the individual metabolic conditions and the syndrome. Affected patients are at an increased risk of early cardiovascular morbidity. The therapeutic options have both beneficial and adverse metabolic effects. Acitretin worsens the lipid profile; anti-androgens may lead to thrombotic events and weight gain, and metformin controls hidradenitis suppurativa with minimal side effects. Conflicting data surround the metabolic effects of biologics, with suggestions of improved lipid profile and lower risk of diabetes mellitus, but also of dyslipidaemia and weight gain. Many encouraging studies have demonstrated resolution of the skin condition after weight loss.

Discussion & Conclusion:
It is critical for physicians to consider the interactions between the disease process and the treatment options in the holistic management of these patients with intrinsically higher risk of metabolic consequences. Other chronic systemic inflammatory diseases such as psoriasis have been studied more extensively with regards to the underlying link with the metabolic syndrome, and we can draw upon the existing knowledge in our management of hidradenitis suppurativa.

PP-CR-51

Elderly Fallers Presenting to the Emergency Department: A Site Comparison between a Singapore and UK Teaching Hospital

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Background & Hypothesis:
The study aimed to provide a cross site comparison of elderly fallers in 2 disparate health economies and to review the impact that healthcare practices may have on resource utilisation.

Methods:
A retrospective case note review of 50 consecutive elderly fallers in the ED of a Singapore and UK hospital was conducted. Data such as patient demographics, types of injuries sustained, ED resources utilised and eventual disposition were collected and analysed.

Results:
In terms of triaging, in the Singapore group, 7 (14%) patients were assigned the highest priority, or Patient Acuity Category Scale 1 (P1), 41 (82%) patients to P2 and 2 (4%) patients to P3. In the UK group, 3 (6%) patients were triaged to the equivalent P1 group, 25 (50%) patients to P2 and 22 (44%) patients to P3. A higher percentage of patients in the Singapore group sustained fractures compared to the UK group. The Singapore group had a higher usage of CT scans for head injuries than the UK group (34% vs 14%), of which 4 (23.5%) patients had a significant scan finding. Patients who were eventually admitted numbered 12 (24%) in the Singapore group and 13 (26%) in the UK group.

Discussion & Conclusion:
Protocolised care for elderly fallers presenting to the ED may improve optimisation of limited resources. Screening risk factors for recurrent falls and implementing appropriate interventions for fall prevention is vital, especially in light of possible increasing incidence of osteoporosis. A more conservative approach to scanning elderly with head injuries may be feasible, but research is needed to determine long-term safety.

PP-CR-52

Risk Factors for Herpes Zoster among Rheumatology Inpatients

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Background & Hypothesis:
This study aimed to study the risk factors and outcomes of herpes zoster (HZ) among rheumatology inpatients.

Methods:
Consecutive admissions over 12 weeks from 1 January 2015 to 31 March 2015 were studied.

Results:
There were a total of 187 admissions among 161 patients, of which 4 (2.1%) admissions were for HZ, all in Chinese females. A 20-year-old with systemic lupus erythematosus (SLE) on prednisolone 15 mg/d and mycophenolate mofetil (MMF) 500 mg/day developed multidermatomal HZ (left C7-T2). Another 51-year-old with SLE, ischaemic cardiomyopathy and asthma, on hydroxychloroquine alone developed disseminated HZ (left T7-T10, L4, right L5). A 39-year-old with Henoch-Schonlein Purpura/gut vasculitis diagnosed 6 weeks earlier, and type 2 diabetes mellitus for 6 years (HbA1c 8.6%) on prednisolone 50 mg/d and azathioprine (Aza) 75 mg/day, developed left T1-T2 HZ. A 69-year-old with microscopic polyangiitis diagnosed 6 months earlier and chronic kidney disease (creatinine 250 umol/L) developed right V1/V2 HZ while on prednisolone 25 mg/d and oral cyclophosphamide (CYP) 50 mg 5 times a week. Time from appearance of vesicles to initiation of antiviral treatment was 2 to 4 days. Intravenous acyclovir was given for 3 to 6 days (3 patients) till cessation of new vesicle formation, followed by oral acyclovir (3)/valacyclovir (1) for a total of 10 to 14 days depending on the severity/extent of HZ. Two patients required pregabalin for postherpetic neuralgia.

Discussion & Conclusion:
HZ that occurred in Chinese females across all ages was multidermatomal, following moderate-high dose prednisolone and MMF/CYP/Aza for recent active systemic disease. Shingles vaccination (Zostavax®) may be useful with careful stratification of patients at risk.

PP-CR-53

Hypohidrosis in Individuals with Exertional Heat Injury: A Prospective Open Cohort Study

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Background & Hypothesis:
Exertional heat injury is typically attributed to exogenous causes. Hypohidrosis is an under-recognised risk factor of heat injury and its prevalence in heat-related illness is unknown. This study aimed to determine the prevalence of hypohidrosis in healthy individuals who developed exertional heat injury.

Methods:
Soldiers from the Singapore Armed Forces who developed heat injury between 1 January 2012 and 31 December 2013 were invited to participate in the study. Subjects were induced to sweat through exercising in a temperature- and humidity-regulated room and atomised starch-iodine powder was administered over their whole body to detect hypohidrosis. If present, investigations to elucidate the cause of anhidrosis were performed.

Results:
Out of 65 males who developed heat injury, 30 consented to participation. One was excluded as an exogenous cause resulted heat injury. Nine (31%) demonstrated hypohidrosis. Of these, 1 (11%) had miliaria profunda, 2 (22%) had acquired idiopathic generalised anhidrosis, and 6 (67%) manifested a new phenotype which we termed acquired symmetrical hypohidrosis (ASH). In all hypohidrotic cases except miliaria profunda, when a cholinomimetic was injected intradermally, sweating was observed in hidrotic areas but not in anhidrotic regions indicating a postsynaptic defect in the sweat glands.

Discussion & Conclusion:
Thirty-one percent of healthy soldiers who developed heat injury had hypohidrosis. Further studies are required to determine the causative role of hypohidrosis in heat injuries. Concurrently, a new clinical phenotype of ASH was identified, and its pathogenesis remains to be elucidated.

PP-CR-54

Dengue during Travel in Singapore: Severe Dengue Associated with Longer Residence in Dengue-Endemic Regions

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Background & Hypothesis:
Dengue is an important febrile infection among international travellers, causing significant morbidity and mortality. Accurate determination of disease burden in travellers requires case ascertainment during travel because of its short incubation period. Severe dengue has an epidemiologic association with secondary infection.

Methods:
Records of 2082 travellers diagnosed with dengue virus infection in Singapore and entered into GeoSentinel from February 2005 to January 2014 were analysed. These included expatriates and foreign workers residing in Singapore as well as temporary visitors, all diagnosed during travel. Demographic and travel characteristics, duration of stay in Singapore, and dengue seasonality during outbreak and non-outbreak years were examined. Chi-square and Wilcoxon rank-sum tests were used to analyse the data when appropriate.

Results:
Of 141 travellers with severe dengue compared to 1941 with uncomplicated disease, significantly more were male (91% vs 77%, $P <0.0001$), older (median 33 years vs 31 years, $P <0.05$), and had resided previously in a dengue-endemic country (66% vs 48%, $P <0.0001$). Patients with severe dengue had significantly longer duration of stay in Singapore (median 1091 days vs 727 days, $P <0.0003$). The data also show a strong seasonal peak in dengue diagnoses in June to July, corresponding to the summer monsoon in Southeast Asia. This seasonal pattern is more distinctly seen during outbreak years, such as in 2005.

Discussion & Conclusion:
Among patients diagnosed with dengue while travelling in Singapore, severe disease was associated with previous residence and longer duration of residence in dengue-endemic regions. Dengue showed a stronger seasonal pattern during outbreak years than during non-outbreak years.

PP-CR-55

Incidence and Risk Factors of Malignancy in Rheumatoid Arthritis Patients: Findings from the Tan Tock Seng Rheumatoid Arthritis Registry

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Background & Hypothesis:
The study aimed to describe the incidence and pattern of malignancy in RA patients in comparison with the general population and identify risk factors of malignancy.

Methods:
Patients who developed malignancies from 2001 to 2013 after the onset of RA were identified. Age-standardised rates (ASRs) of various cancers were analysed and compared with the Singapore Cancer Registry data. Risk factors for developing malignancy, including demographics and disease characteristics at baseline, were analysed using chi-squared test and Student's t-test.

Results:
Of the 1134 patients in the registry, 81 patients developed malignancies at a mean interval of 15.1 (SD: 9.7) years after the onset of RA. The mean age of the 81 patients was 65.9 (SD: 10.8) years, of which 61 (75.31%) were females and 69 (85.19%) were Chinese. There were 70 (86.4%) with solid-organ tumours and 11 (13.6%) haematological malignancies. The ASR of cancer in RA patients was 310.3 for males and 232.5 for females per 100,000 person-years, compared with 229.3 (95% CI, 226.5-232) for males and 218.3 (95% CI, 213.8-216.3) for females in the general population. By cancer type, there is an increased risk of lung cancer, lymphoid neoplasms and stomach cancer in RA compared with the general population. The risks factors for developing malignancy (P <0.05) include male gender, non-Indian ethnicity, onset of RA at an older age, untreated RA and higher disease activity.

Discussion & Conclusion:
The incidence of solid-organ malignancies was higher than haematological malignancies, unlike that in the literature. The overall risk of malignancy is higher in RA patients.

PP-CR-56

Preoperative Evaluation of Liver Function: Role of MR Imaging

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Background & Hypothesis:
Gadolinium ethoxybenzyl diethylenetriaminepentaacetic acid (Gd-EOB-DTPA) is a hepatocyte-specific contrast agent used in magnetic resonance imaging (MRI). Gd-EOB-DTPA has been shown to be useful in the detection and characterisation of focal liver lesions. In addition, the hepatocellular uptake and paramagnetic properties of Gd-EOB-DTPA allow functioning areas of liver to demonstrate shortening of T1 relaxation time, resulting in quantitative assessment of hepatocellular uptake and direct measurement of liver function.

Methods:
We aim to highlight the importance of preoperative evaluation of liver function in major hepatic resection and liver transplantation. The role of MRI in evaluating liver function, with focus on liver-specific MR contrast agent Gd-EOB-DTPA, will be discussed with case examples. Other methods of functional assessment will also be explored, including MELD score, indocyanin green (ICG) and hepatic scintigraphy, with accompanying strengths and limitations.

Results:
The degree of liver impairment correlates with decreased Gd-EOB-DTPA accumulation within the hepatocytes. This is demonstrated in the form of T1 relaxation time, where decrease in reduction rate of T1 relaxation time is strongly correlated with MELD score and ICG clearance. Other than excellent soft tissue resolution and absence of ionising radiation, MRI allows combined anatomical and functional assessment, quantitative evaluation of hepatic perfusion and function as well as detection of liver tumours.

Discussion & Conclusion:
GD-EOB-DTPA-enhanced MR holds great promise to combine both qualitative and quantitative morphological and functional information that not only allows characterisation of focal liver lesions and diffuse liver diseases, but also enables accurate assessment of one's liver function that may impact on surgical planning.

PP-CR-57

Leucine-Rich Alpha-2-Glycoprotein 1 (LRG1) is Differentially Expressed in Healthy and Morbidly Obese Individuals

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Background & Hypothesis:
Obesity confers substantial risk for type 2 diabetes (T2D) and understanding their molecular basis is critical. Leucine-rich alpha-2-glycoprotein 1 (LRG1) is a novel angiogenic factor produced in the liver but has an unknown function in obesity. We aim to compare the circulating levels of LRG1 with the hypothesis that LRG1 will be differentially expressed in healthy versus morbidly obese patients.

Methods:
Morbidly obese (n = 231) and health screening study participants (n = 616) at KTPH were recruited. Patient demographics, anthropometric data and fasting blood were collected. LRG1 protein concentration was determined by using ELlSA. Data analysis was performed using SPSS version 21; data is considered significant when $P < 0.05$.

Results:
For both patient cohorts, comparing lowest tertile of LRG1 versus highest tertile showed lower body mass index (BMI) (26.275Â ± 8.29 vs 31.82Â ± 11.61) kg/m^2. In a substudy of healthy population, plasma LRG1 was significantly higher in Malays and Indians compared to Chinese (20.45Â ± 6.97 and 22.88Â ± 7.96 vs 19.18Â ± 6.86, respectively) µg/mL. Females have higher LRG1 concentration as males (20.8Â ± 6.93 vs 18.4Â ± 7.61) µg/mL. Bivariate analysis of LRG1 in females showed that plasma LRG1 was positively associated with BMI (r = 0.129; $P = 0.007$), high-sensitivity C-reactive protein (Hs-CRP) (r = 0.305; $P < 0.0001$), homeostasis model assessment-estimated insulin resistance (HOMAIR) (r = 0.106; $P = 0.027$) and negatively associated with high-density lipoprotein (HDL) (r = -0.187; $P < 0.0001$) and apolipoprotein A (ApoA) (r = -0.181; $P = 0.013$).

Discussion & Conclusion:
Correlation of LRG1 with gender, ethnicity, HDL, ApoA and Hs-CRP provide insight for the role of LRG1 in obesity and further in-vitro work is needed to understand the clinical significance of these findings.

PP-CR-58

Therapeutic Implications of the Revised Oestrogen Receptor (ER) Status Criteria

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Background & Hypothesis:
Tumour oestrogen receptor (ER) status is determined by immunohistochemistry (IHC) and guides the recommendation for hormonal therapy. In June 2010, the revised ASCO/CAP criteria considered tumours ER positive if at least 1% of tumor nuclei stain positive. We aim to determine how the revised criteria affected treatment recommendations.

Methods:
Retrospective review was performed on 3626 women diagnosed with breast cancer from 1 January 2001 to 31 December 2014. Median follow-up was 68 months.

Results:
From June 2001 to June 2010, 1406 of 2281 (61.6%) women had ER-positive tumours. Median ER staining intensity was 3, in a median of 80% of tumour nuclei. Most patients (1336 of 1406, 95%) received hormonal therapy. There are 521 deaths, 144 local recurrences, 278 distant recurrences and 74 contralateral cancers. After the criteria were revised, 126 additional tumours (9%) were considered ER-positive. Overall, 998 of 1345 women (74.2%) had ER-positive tumours. Of the 126 tumours, 17 were DCIS and the rest were invasive cancers. Median tumour size was 20 mm, 45 (35.7%) were of high grade, 46 (36.5%) were HER2 positive. Eighty-three patients (65.9%) were offered hormonal therapy; 19 received chemotherapy and/or Herceptin. Seven patients were not offerred hormonal thearpy because of advanced age, 2 because of psychiatric conditions; no reason was recorded for the others. Of these patients, 9 developed local recurrence, 19 distant recurrence, 7 contralateral cancers and 11 died.

Discussion & Conclusion:
A small proportion of women are affected by the revision in ER criteria resulting in a small increase in the numbers receiving hormonal therapy.

PP-CR-59

Idiopathic Granulomatous Mastitis – A Case Series

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Background & Hypothesis:
Idiopathic granulomatous mastitis (IGM) is a rare benign condition that mimics carcinoma and abscess. It is often managed with high dose steroids but relapses are not uncommon. The study aims to review the outcome of patients treated for IGM in our unit.

Methods:
We retrospectively reviewed 5 cases diagnosed from December 2012 to June 2015 at our unit.

Results:
Median age at presentation was 44 years (range, 36 to 54). Median BMI was 32.8 (range, 26.9 to 45.1). A painless breast lump was the most common presentation. In 3 cases, initial clinical impression was malignancy, supported by imaging. In the other 2 cases, breast abscess was initially suspected. One patient underwent incision and drainage; imaging showed indeterminate lesions. In all cases, biopsy was negative for malignancy. Multinucleated giant cells and epithelioid histocytes suggestive of granulomas were present in all cases; AFB and fungal stains were negative. High dose corticosteroid was initiated once diagnosis established, starting at 60 mg per day, and tapered over 2 to 3 months. All cases showed dramatic response to steroids, with clinical resolution evident after first week of treatment. Recurrence occurred in 2 cases; one 3 weeks after completion of steroids and the other 6 weeks later. Repeat course of corticosteroid was initiated in one but cytotoxic (steroid-sparing) therapy was initiated in the other due to steroid-induced side effects. Facial puffiness and abdominal discomfort were common. Bilateral mastectomy was performed in 1 patient who experienced frequent recurrences refractory to steroid and cytotoxic medications.

Discussion & Conclusion:
High dose corticosteroids are effective for IGM, reducing unneccesary surgeries.

PP-CR-60

Fox-Fordyce Disease: Bedside Diagnosis with High-Definition Optical Coherence Tomography

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Background & Hypothesis:
Fox-Fordyce disease (FFD) is an uncommon inflammatory disease of the apocrine sweat glands, characterised by intensely pruritic follicular papules involving skin with apocrine glands, such as the axilla and genitalia. The disease is characterised by the obstruction of the apocrine duct at its entrance into the follicular wall. High-definition optical coherence tomography (HD-OCT) for the skin is a recently commercialised imaging modality which enables visualisation of cutaneous structures and even cells. We aim to determine if HD-OCT can be used as a bedside diagnostic tool for the diagnosis of FFD.

Methods:
We identified 3 patients with classical clinical features of FFD. In 2 of these cases, histological analysis revealed hyperplastic infundibulum with hyperkeratosis, parakeratosis associated with spongiosis around the isthmus of the hair follicles, and perivascular and periadnexal lymphocytic inflammation. These features are consistent with the diagnosis of FFD. HD-OCT was performed on the affected axillary and suprapubic skin of the patients. The perilesional unaffected skin was used as controls.

Results:
In all 3 patients, heterogeneously refractile lesions were seen in the epidermis. Central hyper-refractile regions are suggestive of keratin masses in the hair follicles—these correlate with hyperkeratosis and follicular plugging seen on histology. There were hypo-refractile regions around these hyper-refractile components, suggestive of free fluid—these correlate with spongiosis around the isthmus of the hair follicles observed on histology. These HD-OCT features were absent in perilesional normal skin.

Discussion & Conclusion:
The consistent features observed on HD-OCT allow its use as a useful beside diagnostic imaging tool for the diagnosis of FFD.

PP-CR-61

Mild Gastritis: Should I Biopsy Or Not?

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Background & Hypothesis:
Intestinal metaplasia (IM) is a risk factor for gastric malignancy. Mild gastritis is a common endoscopic finding for which many endoscopists do not routinely biopsy for histological examination. Chromoendoscopies are known to increase diagnostic yield for IM but are not uniformly available in many endoscopy units. We aimed to clarify the significance of mild gastritis in a real world Asian cohort.

Methods:
In 2014, 200 consecutive gastroscopies performed by an experienced endoscopist and showing gastritis were biopsied. Different brands of mainly white-light gastroscopes were used.

Results:
Median age was 60 years (range 21-84). Majority of patients were of Chinese ethnic group (86%); 169 patients (85%) had mild gastritis. Among patients with mild gastritis, 91 (54%) had IM histologically; 30 patients with mild gastritis were also deemed to have IM endosopcically, but IM was only present histologically in 24 (80%) of them.

Discussion & Conclusion:
Over half of our patients with seemingly innocuous mild gastritis had IM histologically. Endoscopic IM does not correlate accurately with histologic IM, which is the gold standard. In Asian countries with high prevalence of IM and gastric malignancy, biopsy for histological examination in mild gastritis should be incorporated into routine clinical practice.

PP-CR-62

Tiny Lesions on Gastroscopy: Not So Miniscule in Clinical Significance

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Background & Hypothesis:
During upper endoscopic evaluation, biopsies are often obtained for histological correlation when gross abnormalities are detected. However, routine sampling of tiny lesions is more debatable. Some feel that the expense and time spent obtaining these biopsies is unwarranted, since diminutive findings are unlikely to explain the patient's symptoms.

Methods:
We report herein a case series highlighting 3 cases where biopsies proved that tiny lesions on gastroscopy did have clinical implications.

Results:
Case 1: A middle-aged Chinese lady with Sjogren's syndrome underwent gastroscopy for ongoing dyspeptic symptoms. A focal area of gastritis was biopsied and histology revealed *H. Pylori*-positive MALT lymphoma. A repeat scope 3 months post-HP eradication was endoscopically normal and random biopsies documented clinical remission. However at the 6-month mark, there was recurrence of mild gastritis and histology showed recurrence of disease. She is currently undergoing radiation therapy. Case 2: A middle-aged Chinese gentleman with symptoms of dyspepsia was evaluated endoscopically. A small incisural lesion was biopsied. Histology showed a small B-cell lymphoma with *H. Pylori*-associated chronic gastritis. Further biopsies within 6-months of HP-eradication still showed lymphoid aggregates. He remains on follow-up with gastroenterologist and oncologist. Case 3: A middle-aged Eurasian lady underwent upper and lower endoscopies for anaemia. The only abnormality was a tiny gastric polyp that was biopsied. Histology indicated this was a well differentiated neuroendocrine tumour grade 1. Staging scans were unremarkable. She is planned for surveillance endoscopy.

Discussion & Conclusion:
Seemingly inconsequential findings on upper endoscopy do have clinical significance when examined histologically. Clinicians should have low thresholds to biopsy small lesions.

PP-CR-63

Unmarried Patients with Early Cognitive Impairment (ECI) are More Likely Than their Married Counterparts to Complete Advance Care Plans

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Background & Hypothesis:
Patients with ECI face progressive cognitive decline which impairs their ability to make decisions on healthcare, financial and personal matters. We conducted a study to determine the factors related to completion or non-completion of ACP/LPA in patients with ECI (early dementia or mild cognitive impairment).

Methods:
Patients with ECI at a memory clinic were counselled on the importance of ACP/LPA and followed up longitudinally for up to 12 months to ascertain if ACP/LPA had been completed. Univariate and logistic regression tests investigated factors related to completion and non-completion of LPA.

Results:
A total of 154 patients with mean age 76.3 years (s = 7.23 years) were included in the study, of which 75 (48.7%) were initially willing to consider ACP/LPA after the counselling and psycho-educational session but only 17 (11%) eventually completed ACP/LPA. Among those initially willing to consider ACP/LPA, factors impeding completion of ACP/LPA included patient refusal (72%), lack of family support (49.3%) and operational process factors (50.6%). On logistic regression, patients who were single were 8.9 times more likely to complete ACP/LPA than those who were married ($P = 0.007$). Age, gender, education level and cognitive function did not significantly impact the outcome of ACP/LPA completion.

Discussion & Conclusion:
Unmarried patients are more likely to complete ACP/LPA as they may not have immediate family members to depend on and thus see the relevance of ACP/LPA. Conversely, the overreliance of married patients on their families for future decision-making can hinder completion of ACP/LPA. These findings have important implications in our efforts to promote ACP/LPA among seniors in Singapore.

PP-CR-64

Risk Factors and Causes of Urinary Tract Infection in Home Care Patients of Tan Tock Seng Hospital

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Background & Hypothesis:
Home care is a rapidly growing service in Singapore, especially in the face of an aging population. A major cause of hospitalisation or emergency department visits for home care patients is urinary tract infection (UTI). It is important for home care healthcare workers to understand common symptoms, associated risk factors and micro organisms involved. This study looks at associated risk factors and the micro organisms causing UTI among home care patients.

Methods:
A retrospective study was conducted with data collected from patients under the care of Tan Tock Seng Hospital home care service (PACH) from 1 July to 30 September 2014. We examined factors such as age, gender, functional status, presence of chronic diseases/comorbidities, urinary catheters, symptoms of infection and urinary culture and sensitivities results.

Results:
A total of 105 patients (female: 61%, mean age: 82.1 years, SD: 12.0) were referred to PACH during this period. Prevalence rate of UTI = 28.6% (n = 30) and mean duration of diagnosis postdischarge was 28.8 days (SD: 26.8). Majority (93.3%) had pyuria on UFEME. Commonest presenting symptoms were: cloudy urine (46.7%), fever (43.3%) and foul smelling urine (33.3%). The majority (>75%) of organisms cultured were *E. Coli* (53.3%) and *K. Pnuemoniae* (23.3%). Logistic regression showed that female gender and use of catheter (both *P* <0.05) were independent predictors for UTI. A majority of patients with *E. Coli* UTI were sensitive to nitrofurantoin (80%) and fosfomycin (73.3%).

Discussion & Conclusion:
Female gender and catheter usage are independent predictors for UTI in home care patients in Singapore. The most common micro organisms involved being *E. Coli* and *K. Pneumoniae.*

PP-CR-65

Efficacy and Relapse Rates of Different Treatment Modalities for Progressive Macular Hypomelanosis: A Retrospective Review of Cases Seen in National Skin Centre over Six Years

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Background & Hypothesis:
Progressive macular hypomelanosis (PMH) is an acquired disorder characterised by hypopigmented macules, mostly on the trunk and upper extremities. Many treatment modalities, from topical/systemic antimicrobials to phototherapy, have been studied but these studies were either case reports or small prospective trials. To date, there are no reports comparing the efficacy and relapse rates of these different treatment modalities. Aim: To compare the efficacy and relapse rates of the different treatment modalities for PMH.

Methods:
All cases of PMH diagnosed and treated in National Skin Centre over the last 6 years were reviewed. The diagnosis of PMH was mainly clinical and patient demographics, distribution of hypopigmented macules, treatment efficacy as well as relapse rates were noted.

Results:
A total of 108 patients were seen for PMH, of which 40 were not treated but followed up, 36 were treated with topical antimicrobials and 32 with phototherapy. Of those not treated, 23% recovered spontaneously while 38% in the antimicrobial group and 90% in the phototherapy had remission of their hypopigmentation. After 2 years of follow-up, relapse was noted only in the phototherapy group.

Discussion & Conclusion:
NBUVB appears to be most effective-treatment for PMH but has the potential of relapse. In contrast, antimicrobial therapy's response rates are lower and slow but patients who responded do not suffer a relapse. On the basis of these observations, it would be interesting to explore if a combination of topical/systemic antimicrobial therapy with NBUVB might be the best option to hasten recovery and minimise relapse.

PP-CR-66

Clinical Characteristics, Risk Factors and Outcomes of Southeast Asian Patients with Acute Pulmonary Embolism

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Background & Hypothesis:
The clinical features of acute PE have not been well studied in the Southeast Asian population. We therefore sought to evaluate the clinical characteristics and clinical outcomes (in-hospital) of patients diagnosed with acute PE in our region.

Methods:
From January 2008 to March 2013, 376 patients (53% female, mean age 63 + 16 years) were admitted to our tertiary institution with acute PE. Data were collected retrospectively on baseline clinical characteristics, presenting signs and symptoms, results of electrocardiographic and imaging studies, therapeutic modality and hospital course.

Results:
The most common presenting symptom was dyspnea (74%) followed by chest pain (13%), hemoptysis (4%), syncope (3%) and cardiovascular collapse (1.1%); 42% of patients had tachycardia at presentation and 38% were found to have underlying deep venous thrombosis (DVT). Approximately 36% of the patients had evidence of right ventricular dysfunction/dilatation on transthoracic echocardiogram. The overall in-hospital mortality was 5% with mortality rate associated with cardiogenic shock being 19%. Factors associated with mortality were massive/saddle PE, tachycardia at presentation, underlying DVT, elevated serum troponin, right ventricular dysfunction and cardiogenic shock. Bleeding complications occurred in 9% of the patients (major bleeding in 2.4%) with 2 patients succumbing to fatal intracranial and retroperitoneal bleeding.

Discussion & Conclusion:
Acute PE in the Southeast Asian patients is associated with a mortality rate of 3.5% to 19% depending on clinical presentation. A high index of suspicion is important in the prompt diagnosis of PE as majority of patients are symptomatic. The bleeding complications from treatment are also high.

PP-CR-67

Antidepressant Prescription Patterns and Associated Clinical Features in a Local Tertiary Psychiatric Centre

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Background & Hypothesis:
In view of scanty data on the prescription patterns of antidepressant medications within Asia, we conducted a local study as part of the Research on East Asia Prescription Patterns (REAP) study across 10 Asian countries. We aim to examine the local prescription trends of antidepressants and associated clinical factors within the only tertiary psychiatric hospital in Singapore. We hypothesised that the severity of depressive symptoms and type of specific antidepressant influence patient's compliance to the antidepressants.

Methods:
In this cross-sectional study, 60 patients who were prescribed antidepressant medications were recruited. Socio-demographic profile, clinical features, and concurrent medications were obtained and clinical scales were administered. Differences between groups were tested by independent t-test and ANOVA for continuous variables and χ^2 test for categorical variables as appropriate.

Results:
Overall, 40% of the subjects had primary diagnosis of depression and the rest had substantial depressive symptoms; 96.7% received newer antidepressants. SSRIs were the most frequently prescribed antidepressant type and the most frequently prescribed SSRI was fluvoxamine (40%) followed by escitalopram (21.7%) and fluoxetine (18.3%). No statistically significant difference was seen between the severity of depressive symptoms or specific SSRI and compliance with antidepressant ($P > 0.05$).

Discussion & Conclusion:
The prescription patterns seen are consistent with the clinical guidelines for antidepressant prescription. Antidepressants were prescribed with discretion as most of the subjects either had depression or significant depressive symptoms. Extending this to similar patient populations in other healthcare settings (such as general hospitals, community outpatient settings) would proffer better understanding of our local antidepressant prescription patterns and associated clinical features.

PP-CR-68

Antipsychotics and Electrocardiographic Monitoring in Patients with Schizophrenia

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Background & Hypothesis:
Patients with schizophrenia are more likely to die prematurely compared to the general population. They have a higher risk of cardiovascular related morbidity and mortality. Antipsychotics are also known to be associated with prolongation of the rate-corrected QT (QTc) interval, which is linked to dangerous arrhythmias. We aimed to investigate the practice of electrocardiogram (ECG) monitoring for patients with schizophrenia who were hospitalised in the acute general adult psychiatric wards of the Institute of Mental Health. We also evaluated the prevalence of QTc prolongation in these patients. We hypothesised that 30% of them had ECG monitoring and that the prevalence of QTc prolongation was 30%.

Methods:
We included patients with schizophrenia who were discharged from the wards from 1 July 2014 to 21 July 2014. A retrospective analysis of the medical records was carried out to assess if they had received ECG during their hospitalisation. We also analysed their risk of developing QTc prolongation.

Results:
We had a sample size of 107 patients. There were 31 patients (29%) who received ECG during their hospitalisation. There were 95 patients who had moderate-to-high risk of developing QTc prolongation and 29 of them received ECG. Of the 31 patients who received ECG, 10 of them (32.3%) had QTc prolongation.

Discussion & Conclusion:
The ECG monitoring in the study patients was inadequate. As a result, we were unable to evaluate the prevalence of QTc prolongation with confidence. We recommend performing baseline ECG for these patients and conducting ECG teachings for clinicians who work in the psychiatric service settings.

PP-CR-69

The Prognostic Value of F-18 FDG PET/CT in Hepatocellular Carcinoma Patients Treated by TACE: A Multicentre Retrospective Cohort Study

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Background & Hypothesis:
We evaluated the prognostic value of pretreatment 18F-flurodeoxyglucose positron emission tomography/computed tomography (F-18 FDG PET/CT) in hepatocellular carcinoma (HCC) treated by transarterial chemoembolisation (TACE).

Methods:
A total of 342 patients with HCC treated by TACE between 2009 and 2010 who underwent staging 18F-FDG PET/CT before treatments were retrospectively enrolled from 7 university hospitals. Maximum standardised uptake value (SUVmax) and tumour-to-normal liver uptake ratio (TLR) of the primary tumour were measured from F-18 FDG PET/CT. The prognostic significance of the SUVmax, TLR and clinical variables were assessed with respect to overall survival (OS).

Results:
During the median follow-up of 14.8 months, 222 patients died. In multivariate analysis, stage, Child-Pugh classification, PIVKA-II, SUVmax and TLR were significantly correlated with OS. Patients with high 18F-FDG uptake (SUVmax $\geq$4.0 or TLR $\geq$2.0) showed significantly worse prognosis than those with low F-18 FDG uptake (P <0.001).

Discussion & Conclusion:
Pretreatment SUVmax and TNR from 18F-FDG PET/CT are independent prognostic factors for OS in HCC patients undergoing TACE.

PP-CR-70

Evaluation of Flow Cytometric Detection of Phospho-STAT3 and STAT5 as a Diagnostic Method for Myeloproliferative Neoplasms

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Background & Hypothesis:
Myeloproliferative neoplasms (MPNs) are hematological malignancies resulting in the over-production of 1 or more blood cell lineages. Essential thrombocythaemia (ET), myelofibrosis (MF) and polycythaemia vera (PV) are often associated with Janus kinase *(JAK2)* mutations, resulting in aberrant phosphorylation of signal transducer and activator of transcription (STAT) molecules. The detection *JAK2 V617F* mutation is uninformative in half of ET and MF patients. We therefore explored the use of phospho-STAT expression in MPN diagnosis.

Methods:
EDTA samples from 8 MPN patients in Tan Tock Seng Hospital were tested together with samples from healthy donors. Samples were processed fresh and cells were stimulated with Granulocyte-Macrophage Colony-Stimulating Factor (GM-CSF) and Interleukin-6 (IL-6), labelled with monoclonal antibodies to phospho-STAT3 (pSTAT3) and phospho-STAT5 (pSTAT5) and analysed on a BD FACSCanto™ instrument.

Results:
Neutrophils and monocytes in normal controls have a respective mean 2.0 to 2.2 fold change (range 1.4 to 3.1) and 4.7 to 5.1 fold change (range 3.3 to 7.7) in pSTAT5 expression upon stimulation with GM-CSF. Five and 2 MPN patients exhibited respectively a reduction and increase in the fold change in pSTAT5 expression within the monocytes or neutrophils as compared to normal controls when similarly stimulated by GM-CSF. Differences in pSTAT3 expression can also be found in monocytes, neutrophils and lymphocytes upon stimulation by IL-6.

Discussion & Conclusion:
Analysis of pSTAT expression in MPNs patients upon stimulation with GM-CSF and IL-6 may be a method to diagnose MPN in patients in whom *JAK2 V617F* mutation is uninformative. This study needs to be validated by a larger cohort of samples.

PP-CR-71

Cefepime-Induced Encephalopathy in Elderly Patients with Chronic Renal Impairment: A Clinical Case Series

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Background & Hypothesis:
Cefepime-induced encephalopathy has been reported among the critically ill and patients with renal impairment. It is potentially fatal and often unrecognised. We aim to summarise the clinical course of 4 elderly patients who have been diagnosed with cefepime-induced encephalopathy in our institution.

Methods:
This is a case series of 4 elderly patients who developed encephalopathy after administration of cefepime.

Results:
All 4 patients were admitted to the Department of Geriatric Medicine in Tan Tock Seng Hospital from November 2014 to June 2015. Three of the patients were male. Age ranged from 85-91 years old. All were treated for urinary tract infection with intravenous cefepime which was dose-adjusted according to their renal function, calculated creatinine clearance ranging from 5-18 ml/min. All of them developed drowsiness and confusion. Three had myoclonic seizures. One had oral and limb dyskinesias. The onset of neurological deterioration developed between 3 to 7 days after the start of treatment. Electroencephalography was performed on all patients, showing diffuse encephalopathy except for 1 patient which showed electrographic seizure activity. Other causes of encephalopathy were excluded through investigations of serum biochemistry, brain imaging and spinal fluid examination. There was complete neurological recovery in all patients within 2 to 6 days after stopping cefepime.

Discussion & Conclusion:
Cefepime-induced encephalopathy should be considered when an elderly patient with renal impairment develops change in mental state or seizures during the course of treatment. Early recognition of cefepime-induced encephalopathy is vital as it resolves completely on cessation of the offending drug.

PP-CR-72

Liberal Use of Whole Body CT Scan for Trauma Patient is Not Necessary – A Single Centre Experience

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Background & Hypothesis:
The benefits of whole body CT (WBCT) for evaluating trauma patients include faster diagnosis, fewer missed injuries and mortality benefits. Critics of WBCT cite radiation exposure, erosion of doctors' acumen and rising healthcare cost as pitfalls. We set out to study the outcome differences between WBCT and organ specific CT (OSCT) at a major trauma centre in Singapore.

Methods:
We studied multitrauma patients admitted to the General Surgery Department who had either OSCT or WBCT from January 2008 to December 2009. We compared the Injury Severity Score (ISS) and survival rates between the 2 groups. In a subset analysis, we looked into the additional CT scans required in the OSCT group and also the number of missed injuries.

Results:
A total of 266 patients were included (54 WBCT and 212 OSCT).The mean probability of survival (TRISS) for OSCT is 95.3% and actual survival 97.2% (206/212). The mean TRISS for WBCT is 77.7% and actual survival - 81.5% (44/54). Of 212 OSCT, 38 needed additional CT to complete the work-up. Twelve had either missed injuries or needed a change in management based on the new scan findings. Most were small pneumothoraces which could have been managed conservatively.

Discussion & Conclusion:
We did not find a survival benefit for WBCT. Our centre does not recommend the liberal use of WBCT for trauma as the mortality advantage for WBCT is still not validated. Even though OSCT patients may need additional scans subsequently, we deem it to be an acceptable inconvenience as it does not worsen the treatment outcome.

PP-CR-73

Effectiveness of Brain-Computer Interface-based Programme Boosters for the Treatment of Attention Deficit Hyperactivity in Children – A Preliminary Analysis

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Background & Hypothesis:
Children with attention deficit hyperactivity disorder (ADHD) are found to exhibit unique electroencephalography (EEG) patterns. The use of brain-computer interface (BCI)-based programme as a form of neurofeedback treatment for ADHD has been examined in 2 small trials. Forty children who went through the intensive BCI-based programme in the previous trials had shown significant improvements in ADHD symptoms. The study aims to examine the effectiveness of booster sessions following the intensive programme period. We hypothesised that participants with boosters will improve more on their ADHD symptoms than the group without.

Methods:
Forty children with ADHD inattentive or combined subtype (M = 8.21, SD = 1.45) were recruited from the Child Guidance Clinic. Upon completion of the intensive BCI-based programme (week 8), participants returned for a follow up 3 months later (week 20). During this 3-month period, 20 participants did not go through any BCI-based booster, whereas another 20 did. ADHD rating scale (ADHD-RS) completed by parents at weeks 8 and 20 were used as the primary outcome measure.

Results:
Repeated measures ANOVA analyses were conducted, and participants who dropped out before week 20 were excluded. No statistically significant change was found in ADHD symptoms at week 20 as compared to week 8, in children with and without booster sessions.

Discussion & Conclusion:
From our preliminary analysis, booster at this dose does not appear to help in improving ADHD symptoms after the intensive period. Nonetheless, the current sample size is relatively small. To interpret the results more meaningfully, a larger randomised controlled trial is currently underway.

PP-CR-74

Stigmatisation and Self-Stigmatisation of Patients with Mental Disorders Committed Suicide Attempts

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Background & Hypothesis:
This study aims to determine clinical characteristics of stigmatisation and self-stigmatisation of patients who committed suicide attempts on the basis of "mental illness" and "suicide".

Methods:
We examined a sample of 125 patients committing suicide attempts (2.3 per 1 patient), 61 patients with schizophrenia or schizoaffective disorder (the first group) and also 64 patients with personality disorder, dysthymia, and adjustment disorder (the second group) using by the clinical-psychopathological and psychometric methods.

Results:
In the first group patients were evaluated stigmatising attitudes because of a suicide attempt on the part of friends in 46.9% – females in 52.2%, and men in 34.7% ($P <0.05$). The level of discrimination due to mental disorder was estimated as 44.5%; in females – 52.1% and male – 27.8% ($P <0.01$). In the second group, stigmatising attitudes because of suicide attempt patients were evaluated in 50.9%, and due to mental disorder – in 29.5% ($P <0.001$). Their own negative experience of discrimination because of suicide attempt and mental disorder, patients evaluated the same (respectively 33.5% and 28.5%). In the first group, the level of discomfort due to a suicide attempt patients is estimated as 31.8%, and due to mental illness – as 36.7% (females – 42.6% and male – 23.7% [$P <0.05$]). In the second group, respectively, as 46% and 41.4% (without gender distinction).

Discussion & Conclusion:
The stigmatising value of suicide attempt and mental illness is high in both groups, but in case of psychotic mental disorders, the stigmatising value of mental illness is higher. Females experienced stigma heavier than male patients.

PP-CR-75

Physical Restraint in the Provision of Medical Care in Somatic Hospital: Ethics and Law

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Background & Hypothesis:
The ethics and legality of the use of physical restraint (PR) in the case of patients with acute mental disorders in general practice are discussed.

Methods:
Anonymous survey among 42 physicians (16 neurologists and 26 resuscitators) was carried out using sociological method. We studied the prevalence, legality and ethical assessment of PR.

Results:
A total of 62.5% of neurologists noted agitation in 10% of their patients, and the rest 37.5% – more than 25% of patients; 75% of physicians consider the need of use of PR for 50% of patients, and the others 25% – in 70-100% of cases (including dementia); 65.4% of resuscitators noted agitation in 40% of their patients, and the rest 34.6% – in 50-80% of cases; 61.4% of resuscitators considered it necessary to use these measures in 70% of cases, the remaining 36.8% – 20-40%. There is no legislative regulation of the use of PR in neurology and reanimatology, so physicians are guided by "common sense". More than 63% of neurologists and resuscitators estimated the importance of PR in 8-10 points on a 10-point scale, and the rest showed 5-7 points.

Discussion & Conclusion:
Between 10% and 80% of neurological patients has a PR which prevents negative consequences of uncoordinated behaviour. It should be designed on legislative basis for the use of PR, similar to the psychiatric law. During the transition, consultation with a psychiatrist period should be provided, which has rights to appoint such short-term measures in acute psychoses endangering the patient or others.

PP-CR-76

The Association of *rs12444979* and *rs2241423* Genotype Combination with the Risk of Uterine Hyperplastic Processes

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Background & Hypothesis:
A lot of women of fertile and predecidual age have hyperplastic processes of endometrium having a risk of malignization in 10-50% of cases. The present study investigated an association between *rs12444979* and *rs2241423* polymorphisms and risk of uterine hyperplastic processes in Russian women.

Methods:
Study sample comprised 1873 unrelated women including 908 women with uterine hyperplastic processes and 965 women of healthy control. The case and control group were of Russian origin coming from Central region of Russia. Patients with uterine hyperplastic processes were examined by experienced gynaecologists and instrumental investigations (ultrasound diagnosis, hysteroscopy) had been done. Genotyping of single nucleotide polymorphisms *rs12444979* and *rs2241423* was performed using TaqMan assays. APSampler software was utilised to assess the association of genotype combinations with occurrence of uterine hyperplastic processes.

Results:
The frequency genotype combination of *C rs12444979* with *G rs2241423* was 95.9% in patients with uterine hyperplastic processes and 93.71% in control group (Pperm = 0.05, ĐžR = 1.57, 95% CI 1.03-2.40).

Discussion & Conclusion:
The combination of alleles *C rs12444979* and *G rs2241423* is the risk factor of developing uterine hyperplastic processes in Russian women. The study was supported by the project ("Studying of the genetic risk factors for multifactorial diseases").

PP-CR-77

Predictors of Survival in Moderate to Advanced Dementia: A Retrospective Review

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Background & Hypothesis:
The rising prevalence of dementia is a global problem. Family, economic and healthcare resources will be further tested by the age-related increase, estimated to double to 65.7 million by 2030. The aim of this study was to evaluate factors affecting the survival of patients with moderate to advanced dementia, and to understand the resource utilisation in our local setting.

Methods:
This was a retrospective review of 233 patients diagnosed with moderate to severe dementia admitted to a tertiary care hospital between October 2013 to September 2014. Medical charts were reviewed for factors potentially impacting patient survival, including length of hospital stay (LOS), frequency of hospital admissions, emergency room (ER) attendances, biochemical and comorbidity indices. Patients were followed to the point of demise or study end. Continuous variables were studied using descriptive analysis, whilst count data was evaluated using frequencies. Cox regression survival analysis was applied for predictive variables.

Results:
A total of 87 of 233 patients died by the end of study. LOS significantly affected survival, with a hazard ratio of 1.017 (P <0.01). LOS in patients who died was significantly longer (median = 14 days, P <0.05). The use of a feeding tube was associated with poorer survival (median = 58 days, P <0.05) compared to patients without (median = 152 days). Palliative care referrals considerably reduced number of ER visits (P <0.05).

Discussion & Conclusion:
Prolonged LOS and enteral feeding adversely affected survival whilst palliative support reduced ER visits. Early palliative care intervention could potentially further reduce healthcare utilisation.

PP-CR-78

A Human-Trained Numerical Observer Model for PET Lesion Detection Tasks

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Background & Hypothesis:
A study is described that investigates the capacity for mathematical observer models to mimic the performance of human observers in a PET lesion detection task.

Methods:
FDG-PET data from 17 tuberculosis patients presenting diffuse hyper-metabolic lung lesions were selected for the study, to include a wide range of lesion sizes and contrasts. All subjects were scanned on a simultaneous PET/MR system (Siemens mMR) with 1 bed position over the lungs, after a 4.8 ± 1.6 mCi injection and 60-minute uptake period. Various noise levels were simulated by discarding events in the PET list mode. Thirty-three lesions were selected in the 17 patients, as well as 1 background region in each. A lesion detection task including these 550 images ((33 lesions + 17 backgrounds) × (1 original image + 10 simulated noise levels)) was developed and presented to 5 experienced image viewers (2 nuclear medicine radiologists and 3 postdoctoral researchers). The humans' decisions were used to train linear observer models. Various fractions of the decision data were used for training, and accuracy was evaluated as the model's ability to predict the remaining decisions, i.e. those not used for training, for 100 realisations.

Results:
The findings show that good performance, in terms of matching human accuracy, was achieved with only 20% training. The model was robust, with similar trends for all human observers.

Discussion & Conclusion:
The application of mathematical models as surrogates for human observers has been investigated, and the findings here suggest that a numerical observer trained with decisions from human observers can yield good predictive utility.

PP-CR-79

Treatment Delay in Door-to-Balloon Time (D2B) in Southeast Asian Patients Undergoing Primary Percutaneous Coronary Intervention (PPCI) for ST-Segment Elevation Myocardial Infarction (STEMI): A Key Process Analysis of Patient Factors

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Background & Hypothesis:
The timeliness of reperfusion via PPCI is important in determining mortality in the management of patients with STEMI. Current guidelines recommend a D2B of <90 minutes. Programme or patient-related factors may reduce mortality benefit of PPCI and clinical predictors of delay can vary.

Methods:
From January 2009 to December 2012, 1268 patients presented for STEMI and underwent PPCI. A key process analysis was performed on our PPCI programme and divided patients into 2 groups: non-delay, defined as D2B <90 mins and delay group defined as D2B >90 mins. Data on baseline clinical characteristics, mode of presentation, angiographic findings, therapeutic modality and hospital course was collected retrospectively.

Results:
Median D2B for the overall study group was 60 mins and delay occurred in 16% of patients. The delay group was more likely to be female, older, a higher prevalence of prior MI and tend to self-present rather than use the emergency service. The proportion of anterior MI were comparable in both groups but the incidence of posterior MI was higher in the delay group (4% vs 1%, $P = 0.006$). There was no socio-economic or ethnic differences between both groups. Overall in-hospital mortality was 5.6% with a trend towards a higher in-hospital mortality for the delay group (8.4% vs 5%, $P = 0.06$).

Discussion & Conclusion:
Our registry showed that delay in D2B occurring in 16% of our patients undergoing PPCI for STEMI was associated with a higher in-hospital mortality. Patient-related factors for delay unique to the hospital and the Southeast Asian population were identified and warrant further studies/intervention.

PP-CR-80

What Predicts Increased Survival in Dementia?

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Background & Hypothesis:
Dementia decreases life span and extant literature shows people with dementia (PWD) have significantly decreased survival compared to their counterparts without dementia. The median survival of PWD from the time of diagnosis has been found to range from 3.5 to 4.5 years. This study explores the factors associated with increased dementia survival of ≥4 years.

Methods:
Between January 2007 and June 2014, PWD diagnosed and followed up in a tertiary hospital clinic and had died were included. These subjects were stratified into those who died <4 years and those ≥4 years from time of diagnosis. Various demographic and clinical variables were subjected to univariate and multivariate analysis to determine the factors associated with survival ≥4 years.

Results:
Out of 1312 PWD, 189 died of which 46 (24.3%) survived ≥4 years. More PWD (54%) died in the hospital than in their own homes (36.5%). Both univariate and multivariate regression analyses revealed that 2 factors, better dementia functional stage (OR = 0.64, P = 0.021, 95% CI 0.43-0.93) by FAST score and lesser comorbidities (OR 0.77, P = 0.043, 95% CI 0.22- 1.10) by Charlson index, were associated with lowered odds of death. Surprisingly, cognitive status (MMSE), age of dementia onset and use of cognitive enhancers did not impact survival.

Discussion & Conclusion:
Functional status of PWD but not cognitive status impacts dementia survival. As functional disabilities are more amenable to rehabilitative interventions than cognitive deficits, these findings have important implications for care of PWD.

PP-CR-81

Pilot Study to See Postural Variation of Augmentation Index in Hypertensive Patients on Different Antihypertensive Medications

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Background & Hypothesis:
Augmentation index (AI), is a measurement of arterial stiffness, associated with increased cardiovascular risk. The current study focused on the variations in AI in both supine and sitting position for patient with hypertension and to look for effects of different antihypertensive medications on postural variations in AI.

Methods:
This study analysed AI in both supine and sitting position for patients with hypertension (n = 17). Variations in AI with posture were compared between hypertensive patients using ACE inhibitors, angiotensin receptor blockers (ARBs), beta blockers, calcium channel blockers (CCB) and diuretics to see effects of different antihypertensives on postural AI variations. Measurement was be done by SphygmoCor, gold standard for non-invasive central pressures assessment. Statistical analysis were done via paired T-test and student's T-test. A value of $P <0.05$ was accepted as statistically significant.

Results:
Significant postural changes of AI were not seen in hypertensive patients. AI decreased from sitting to supine was observed in hypertensive patients on ACE inhibitor/ARBs ($P <0.05$). However, beta blockers, calcium channel blockers and diuretics did not show significant variation of AI with postural changes.

Discussion & Conclusion:
There was no significant postural variation in AI in hypertensive patients except for patients on ACE inhibitors/ARBs. The decrease in supine AI on ACE inhibitors or ARBs may have a clinical significance in reducing early morning cardiovascular events.

PP-CR-82

Augmentation Index Variation with Posture in Non-Hypertensive Subjects Versus Hypertensive Patients on ACE Inhibitors

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Background & Hypothesis:
Augmentation index (AI), is a marker of arterial stiffness and cardiovascular mortality. The current study is focused on the variations in AI in both supine and sitting position for subjects with non-hypertension subjects versus patients with hypertension on ACE inhibitors or angiotension receptor blockers (ARBs) and to look for effects ACE inbitors or ARBs on postural variations in AI.

Methods:
This study was to analyse AI in both supine and sitting position for subjects without hypertension (n = 10) versus hypertensive patients on ACE inhibitors or ARBs (n = 10). Measurements were done by SphygmoCor which is the global gold standard for non-invasive central pressures assessment and AI. Statistical analysis: differences between characteristics at supine and sitting position were compared using non-parametric paired test of Wilcoxon signed-rank test in normotensives and via paired T-test and student's T-test in hypertensive age group. A value of $P < 0.05$ was accepted as statistically significant.

Results:
In non-hypertensive subjects, aortic AI significantly increased from sitting to supine position ($P < 0.05$), whereas AI decreased significantly in supine position from sitting position in subgroup of patients on ACE inhibitors ($P < 0.05$).

Discussion & Conclusion:
Our findings suggested that AI increased from sitting to supine position displayed in non-hypertensive subjects. On the other hand, in hypertensive patients on ACE inhibitors or ARBs, there is significant decrease in AI in supine position. Early morning reductions of supine AI could be significant on ACE inhibitors or ARBs contrary to increase in supine AIs in patients who are not on antihypertensives.

PP-CR-83

A Comparison Study to See Differences in Postural Variation of Augmentation Index in Non-Hypertensive and Hypertensive Subjects on Medications

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Background & Hypothesis:
Augmentation index (AI), is a measure of arterial stiffness and cardiovascular mortality. Postural variation of AI has not been described in literature. We observed that the AI increased in supine position in most non-hypertensive volunteers. The current study compares measurement of AI with posture in hypertensive and non-hypertensive subjects.

Methods:
This study analysed AI in both supine and sitting position for patients without hypertension (n = 21) and hypertensive subjects (n = 21). Variations in AI with postural changes were compared between hypertensive and non-hypertensive subjects; and subsequently compared among hypertensive patients using ACEI/ARB, beta blocker, calcium channel blocker and diuretics to see effects of different antihypertensives on postural AI variations. Measurements were done by SphygmoCor, gold standard for non-invasive central pressures assessment. Wilcoxon signed-rank test and paired T-test were used for statistical analysis. A value of P <0.05 was accepted as statistically significant.

Results:
In normotensive subjects, aortic AI significantly increased from sitting to supine position (P <0.05), whereas significant postural changes of AI was not seen in hypertensive patients. AI on the contrary, significantly decreased with posture from sitting to supine in subgroup of patients on ACE inhibitors (P = 0.05).

Discussion & Conclusion:
AI increases in supine posture in subjects who are not on treatment. These findings may suggest that patients who are prehypertensive's or hypertensives not on treatment may have a greater increase in supine AI; thus predisposing them to early morning cardiovascular events but this effect is abolished or blunted when patients are on antihypertensives.

PP-CR-84

Hip Fractures in Singapore: Predictors Affecting Functional Outcomes After Inpatient Rehabilitation

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Background & Hypothesis:
Incidence of hip fracture in the elderly is rising as a result of aging population. Hip replacement surgery is often needed and intensive inpatient rehabilitation thereafter may optimise physical functions.

Methods:
A retrospective study (January 2012 to December 2014) evaluating 70 patients admitted for inpatient rehabilitation using the hip fracture pathway was conducted. Aim was to correlate outcome measures with clinical predictors after hip surgery.

Results:
The mean age of the patients was 75.9 years ± SD 9.1. Majority (72.9%, n = 53) were female; 68.6% (n = 48) were neck of femur fractures. Hemi-arthroplasty was the most common surgery performed (57.4%, n = 39). The average number of days from sustaining a hip fracture to surgery was 4.8 ± 4.2 days. The mean rehabilitation LOS was 20.5 days ± SD 10.0. The mean FIM scores on admission and discharge were 85.0 ± SD 14.1 and 97.6 ± SD 15.9, respectively. Mean FIM gain was 12.7 ± 7.5. Mean FIM efficiency per week was 4.84 ± SD 3.55. Age >75, time from fracture to surgery and type of hip fracture were significant predictors. Lower FIM efficiency was seen in age >75 ($P = 0.037$) and those ≥3 days from sustaining fracture to surgery ($P = 0.020$). Patients with intertrochanteric fractures required longer rehabilitation LOS ($P = 0.001$).

Discussion & Conclusion:
Larger prospective trials are needed to verify clinical predictors with outcome measures. Strategies to optimise these predictors may improve outcome.

PP-CR-85

Chronic Pain and Health-Seeking Behaviours among an Elderly Asian Population

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Background & Hypothesis:
Chronic pain is a common symptom in older adults and is often associated with significant negative functional and psychosocial effects. There is paucity of literature on chronic pain in older Asian adults especially those focused on pain characteristics and health-seeking behaviour. The objective of this study is to describe the epidemiology of chronic pain amongst older adults who attend primary care clinics and to evaluate their pain characteristics as well as health-seeking behaviour.

Methods:
This is a cross-sectional study of 65 years or older adults who attended 3 primary care clinics under the National Healthcare Group. Eligible patients were sampled based on a sampling frame stratified for gender and age to ensure adequate representation in each subgroup.

Results:
A total of 53.6% of respondents have chronic pain which increases with age. The oldest age group of 85 years and above tends to have daily pain and constant pain and was less independent in self-care. Pain intensity, pain locations or causes of pain were not associated with age. About two-thirds of patients sought 2 or more types of treatment for their pain and one-third required 2 or more healthcare visits a month. The oldest old seeks treatment for pain more frequently but were less likely to consult a general practitioner.

Discussion & Conclusion:
Chronic pain drives older adults to seek treatment frequently. This implies that older adults with chronic pain utilises significant health care resources and improvement can be made to our current system to manage this problem more effectively.

PP-CR-86

Intramedullary Nailing of Abnormally Bowed Femurs

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Background & Hypothesis:
The mismatch in curvature between a nail and an abnormally bowed femur may result in a higher rate of complications including nail perforation and fracture blowout. This study describes our technique and experience with nailing abnormally bowed femurs with standard intramedullary devices.

Methods:
Patients with abnormally bowed femurs were identified and individual case records were retrieved and examined. Preoperative and postoperative radiographs were analysed. Intramedullary fixation methods used to address abnormally bowed femurs were identified.

Results:
Four patients were identified who had abnormally bowed femurs with fractures that were surgically managed with intramedullary fixation. The patients included in the study included patients with atypical femoral shaft fractures from prolonged bisphosphonate use. Two patients were fixed with piriformis-start nail and 1 patient was fixed with a trochanteric-start nail. The remaining patient had fractures on both sides at different times, with the left side fixed with s piriformis-start nail, and the right fixed with a trochanteric-start nail. There was uncomplicated bony union in all of these cases. The fractures fixed with piriformis-start nail united with a more anatomical morphology whereas those fixed with the trochanteric-start nail often led to a straightened morphology when united. There were no cases of cortical penetration.

Discussion & Conclusion:
Complications as a result of intramedullary fixation in abnormally bowed femurs may be minimised by the use of piriformis-start femoral nail inserted through the tip of the greater trochanter, with a more anterior entry point and smaller implant sizes.

PP-CR-87

Terrible Triads Injuries of the Elbow: Our Clinical Experience

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Background & Hypothesis:
The terrible triad injury of the elbow is one of the most challenging injuries to treat, and has been associated with high complication rates and poor clinical outcomes. The objective of this study is to evaluate the clinical outcomes and complications following surgical management of these injuries.

Methods:
Patients with terrible triad of the elbow treated between 2010 and 2013 at Tan Tock Seng Hospital by a single surgeon were retrospectively reviewed. Our surgical treatment involved fixation or replacement of the radial head o, repair of the anterior capsule or coronoid fractures and lateral collateral ligaments. Outcomes measured include range of motions, Disabilities of the Arm, Shoulder and Hand (DASH) Questionnaire Score and the Mayo Elbow Performance Scores.

Results:
There were 11 patients (11 elbows) included in the analysis, and the mean follow-up period was 30.5 months (range 14 to 46 months). The group comprised of 7 males and 4 females. The average age of the patients was 47.2 years old (range 35 to 79 years old). Only 2 patients had poor functional outcome scores. One patient was complicated by radio-ulnar synostosis, and the other patient suffered from recurrent elbow instability.

Discussion & Conclusion:
Our surgical strategy for terrible triad of the elbow incorporates both bony and soft tissue fixation, allowing good functional recovery of the elbow, with minimal complications.

PP-CR-88

First Multicentre National ICU Nutrition Survey in Singapore

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Background & Hypothesis:
Underfeeding in intensive care is associated with increased morbidity and mortality. We seek to audit intensive care nutrition practice and delivery performance across surgical and medical ICUs in Singapore, to focus future quality improvement strategies.

Methods:
A retrospective audit of 263 patients in 5 ICUs across 2 general hospitals was done based on these ICUs results in the International Nutrition Survey (INS) 2013. Results were compared to INS 2011. Performance indices and key areas of deficiencies, especially common across ICUs, were identified and prioritised for quality improvement.

Results:
In 2013, all ICUs had prescription of nutritional calories and proteins spot on as per international guidelines. Calories delivered were between 52.2-63.6%, with protein delivered between 52-60.7% only. Feed interruption duration average per day was 6-11 hours, with gastric residual volume (GRV) issues and inappropriate fasting for various events the primary reasons. Enteral nutrition was initiated >90% of the time in all ICUs before 72 hours, an improvement in performance from 2011. Calorie and protein delivery targets actually dropped from 2011 to 2013 and was attributed to less use of parenteral nutrition.

Discussion & Conclusion:
ICU dieticians ensure appropriate nutrition prescriptions but achieving target delivery remains elusive. Key areas to revise in local feeding protocols will target GRV management, fasting guidelines, and judicious indicated use of PN to achieve nutrition goals. We encourage all other ICUs to audit their practice and will repeat our audit after implementing a new ICU feeding protocol.

PP-CR-89

Adrenal Tumours: Correlation between Contrast-Enhanced Computer Tomography and Chemical Shift Magnetic Resonance Imaging

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Background & Hypothesis:
Current protocol requires dedicated multiphasic adrenal CT for evaluation of incidentally-detected adrenal nodules. The aim of this study is to determine whether chemical-shift (limited sequence) MRI could reliably diagnose adrenal nodules.

Methods:
From January 2010 to December 2014, 62 adrenal nodules (50 adenomas and 12 non-adenomas) were studied by single portal venous phase CT (PVP-CT) and chemical-shift MRI (CS-MRI). Attenuation on PVP-CT, signal-intensity index (SII) and adrenal-to-spleen chemical shift ratio (ASR) were measured and calculated for each adrenal tumour. Qualitative analysis (QA) for loss of signal between in- and out-of-phase images was also performed.

Results:
The sensitivities and specificities for adrenal adenoma using SII ($>16.5\%$), ASR (<0.71) and qualitative analysis were 84% (42/50) and 91.7% (11/12), 70% (35/50) and 100% (12/12), and 70% (35/50) and 100% (12/12). The average attenuation value on PVP-CT showed no significant difference between adenomas and non-adenomas. On MRI, the mean SII for adenomas was higher than non-adenomas (42.9% vs 3.9%, $P <0.001$) and the mean ASR was lower (58.6 vs 96.4, $P <0.001$). For adenomas, there were strong correlations between the attenuation on PVP-CT and SII/ASR on CS-MRI (r = 0.6, $P <0.001$).

Discussion & Conclusion:
MRI-based SII provided higher diagnosis accuracy than ASR and QA. Significant correlation between attenuation on PVP-CT and SII/ASR on CS-MRI was found for adenomas. Limited sequence MRI may replace dedicated multiphasic adrenal CT as the firstline modality for evaluation of adrenal adenomas, reducing risks associated with ionising radiation and iodinated contrast administration.

PP-CR-90

Understanding Prostate MRI: How are Lesions Assessed in Clinical Practice?

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Background & Hypothesis:
MRI is standard of care for evaluation of patients with known or suspected prostate cancer. Recent advances in MRI technology have improved diagnostic accuracy for tumour lesion detection and staging. In this poster, we highlight the pertinent facts about this imaging technique and demonstrate with clinical examples how lesions are assessed for their likelihood of harbouring clinically significant disease according to the Prostate Imaging and Reporting and Data System (PIRADS).

Methods:
In this exhibit, the reader will learn about the recommended imaging protocol for MRI of the prostate gland. We will illustrate the imaging features that constitute the various PIRADS scores for each of the components of multiparametric MRI (standard T2-weighted, diffusion weighted, and perfusion weighted MRI).

Results:
Using case examples, we will demonstrate how PIRADS scores are assigned and how it has implications on the subsequent management of the patients.

Discussion & Conclusion:
Standardisation of interpretation of multiparametric MRI is important but evolving. Through this exhibit, we intend to show how clinical cases can be appropriately evaluated and managed based on the latest version of PIRADS.

PP-CR-91

Investigating Relationships between Aggression Beliefs and Reactive/Proactive Aggression in Children with Externalising Disorders

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Background & Hypothesis:
Children with externalising disorders display more aggression, which is associated with psychosocial maladjustment. Normative beliefs about the appropriateness of aggression have been found to predict aggressive behaviours. However, beliefs may have different pathways to aggression depending on belief content (general/retaliatory) and function of aggression (reactive/proactive). Examining these pathways can facilitate our understanding of maladaptive aggression in referred children. It is hypothesised that retaliatory beliefs will predict reactive aggression while general beliefs will predict overall aggression (reactive and proactive aggression).

Methods:
A total of 282 clinically referred children aged 7-16 years old (M = 10.6, SD =1.9) who were referred to the Child Guidance Clinic in Singapore and fulfilled DSM-IV-TR criteria for attention deficit hyperactivity disorder (ADHD), oppositional defiant disorder (ODD) and/or conduct disorder (CD) were recruited as part of a larger randomised controlled trial. Participants completed the Normative Beliefs about Aggression Scale (NOBAGS) [subscales: retaliatory beliefs, general beliefs] and the Reactive Proactive Aggression Questionnaire (RPQ) [subscales: reactive aggression, proactive aggression].

Results:
Controlling for gender, diagnosis and age, linear regression analyses showed that general beliefs significantly predicted proactive aggression but not reactive aggression. Retaliatory beliefs did not significantly predict reactive aggression.

Discussion & Conclusion:
General beliefs predict proactive aggression. This may be due to the instrumental nature of proactive aggression, whereby beliefs are accessed more readily. Conversely, reactive aggression is impulsive in nature and hence is more likely to be triggered by environmental events rather than aggression beliefs. Thus, aggression is multifaceted and effective aggression management in children must target the various causes depending on aggression function, including normative beliefs.

PP-CR-92

Extravasation of Contrast Medium during CT Scanning – Tracking and Reduction of Rate Of Extravasation

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Background & Hypothesis:
Contrast-enhanced CT is performed by the intravenous injection of a large volume of contrast at a high rate by an electric power injector. While not common, extravasation of contrast can be serious. It is an adverse outcome for patients. It causes pain and swelling. Serious complications may occur such as tissue necrosis and compartment syndrome. It has potential medico-legal consequences. We tracked the rate of extravasation of contrast during CT from 2007 to 2014. In 2008, we implemented several measures to try to reduce the rate of extravasation of contrast.

Methods:
By analysing the processes using a flow chart, we were able to identify the most likely causes for extravasation. We summarised the main causes to be addressed using the Pareto chart. A strategy for change was devised by changing processes, equipment and incorporating the latest technology. For example, the radiographer stayed to observe the injection site for routine CT studies, standardising larger-sized venula for CT angiographic studies and utilising the extravasation detection sensor. This strategy was progressively implemented by multiple PDSA cycles.

Results:
The incidence of extravasation of contrast ranges from 0.03% to 1.3% in the literature. We were able to progressively reduce the rate of extravasation of contrast from 0.16% in 2007 to 0.07% in 2014.

Discussion & Conclusion:
Extravasation of contrast has potentially serious consequences. Reducing its incidence can be achieved by changing processes and adopting new technology. Leadership and motivation at every level is necessary.

PP-CR-93

Pattern of Allergic Diseases among Military Servicemen Referred to a Clinical Immunology/Allergy Service in Singapore

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Background & Hypothesis:
We aimed to study the pattern of allergic diseases in servicemen from the Singapore Armed Forces (SAF).

Methods:
Referrals to the Tan Tock Seng Hospital Clinical Immunology/Allergy Clinic from 1 January 1998 to 15 May 2015 were retrospectively reviewed.

Results:
There were 247 referrals comprising 90.7% males, predominantly active full-time National Servicemen (NSF). The mean age at diagnosis was 24 +/- 6 years, with 88.3% Chinese. The most common referring diagnoses were for insect venom allergy (37.5%), urticarial/angioedema (18.3%), anaphylaxis (17.8%); drug allergy (15.4%), and food allergy (9.1%). Following evaluation by the allergist, insect venom allergy (36.5%), anaphylaxis (24.0%), allergic rhinitis (23.8%) and NSAID hypersensitivity (20.7%) were the most common conditions. Of the 32 servicemen diagnosed with insect venom anaphylaxis, 9 (28.1%) underwent allergen specific immunotherapy (AIT), of whom 6 were regulars and 3 NSF. All received yellow jacket and paper wasp AIT, and 1 received honey bee AIT in addition. No serviceman developed systemic reactions. To date, only 1 serviceman has completed 5 years of AIT, the mean duration of all servicemen on AIT being 2.2 +/- 1.3 years.

Discussion & Conclusion:
Insect venom allergy, anaphylaxis, allergic rhinitis and NSAID hypersensitivity were the most common referrals from the SAF. Medical officers in the military should be trained and equipped to manage military servicemen with these conditions at primary care level, in particular knowledge of the anaphylaxis action plan, and when and how to use epinephrine autoinjectors. Knowledge of NSAID hypersensitivity reactions is also important especially since non-selective NSAIDs are commonly used in the treatment of musculoskeletal injuries during training.

PP-CR-94

Recognition and Prompt Management of Haemophagocytic Lymphohistiocytosis (HLH)

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Background & Hypothesis:
HLH is a rare, aggressive life threatening syndrome of uncontrolled immune activation leading to rapid end-organ dysfunction and death. Primary HLH is caused by gene mutations e.g. at FLH loci. Secondary HLH can be associated with EBV, lymphomas, autoimmune and rheumatological conditions.

Methods:
Patients admitted since 2014 with features compatible with HLH are included.

Results:
Case 1: A 69-year-old female, who was well 6 days earlier, presented with Behcet's like symptoms (oral ulceration, eye swelling and erythema nodosum), fever, progressive pancytopenia, grossly deranged liver function tests, hyponatraemia, raised LDH, triglycerides, ferritin, and refractory disseminated intravascular coagulation (DIC) without evidence of sepsis. A pan CT scan showed no lymphadenopathy, hepatosplenomegaly or nasal pathology, but the bone marrow biopsy showed haemophagocytosis with NK cell leukaemia. Case 2: A 27-year-old female presented with features suggestive of HLH (persistent fever, hepatosplenomegaly, progressive bicytopenias, hypofibrinogenaemia, hyperferritinaemia, hypertriglyceridaemia, raised LDH, abnormal liver function tests and gross electrolyte disturbances). Although bone marrow biopsy demonstrated haemophagocytosis and flow cytometry is suggestive of HLH, no apparent cause was found from pan CT scans, bone marrow, virology or autoimmune workup. Both cases sufficiently satisfied the criteria for diagnosing HLH and were promptly treated with etoposide chemotherapy and dexamethasone, prior to establishing the underlying cause, and with improvement of their cytopenias, coagulopathy and liver function tests.

Discussion & Conclusion:
Prompt recognition of the clinical features with initiation of HLH treatment is crucial to bridge the gap till the underlying cause and its definitive treatment can be initiated.

PP-CR-95

Healthcare-Associated Pneumonia (HCAP): Identification of Low- And High-Risk Patients

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Background & Hypothesis:
We aimed to identify low- and high-risk subgroups of patients admitted for healthcare-associated pneumonia (HCAP).

Methods:
We conducted a retrospective study of adults aged 55 years or older who were admitted for HCAP. Demographic, patient profile, comorbidity, clinical, laboratory and chest radiograph data were used to construct logistic regression models that employed Pneumonia Severity Index (PSI) or CURB-65 to predict 30-day mortality and guide the creation of low- and high-risk subgroups.

Results:
Among 798 hospital episodes for HCAP, the median age was 80 years and 67.9% of patients had premorbid ambulation impairment. The 30-day mortality was 35.3%. For the subgroup (3.5%) of patients with PSI class II with no premorbid ambulation impairment, 30-day mortality was 0%. At the other end, CURB-65 score of 4 or 5 with premorbid ambulation impairment identified a subgroup (3%) of patients with 30-day mortality of 83.3%.

Discussion & Conclusion:
Combining either PSI or CURB-65 with premorbid ambulation status, we were able to identify very low- and high-risk mortality subgroups among HCAP patients. In the appropriate clinical context, early discharge may be considered for the very low-risk subgroup, while de-escalation of antibiotic therapy and symptom palliation may be considered for the very high-risk subgroup.

PP-CR-96

Diagnosing Lung Cancer: Choosing the Best for Your Patient

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Background & Hypothesis:
In diagnosing lung cancer, the first procedure should ideally provide both diagnosis and information about staging, safely and with minimal delay. Specific radiological features on presentation could direct us towards choosing the best first diagnostic procedure for each patient. We wanted to assess the congruence between radiological features and diagnostic procedure performed, and the respective diagnostic yield of each procedure in patients with suspected lung cancer.

Methods:
A retrospective review was done for 204 patients who were diagnosed with lung cancer at our centre between January 2011 and December 2013.

Results:
A total of 72% of patients had ≥2 radiological features described by ACCP (peripheral/central tumour/mediastinal lymph node/mediastinal infiltration/pleural effusion/bronchus sign) concurrently on first presentation to hospital. Trans-thoracic needle aspirate (TTNA) was the most frequently performed first procedure (detection rate: 95%) followed by bronchoscopy (detection rate: 68%). Bronchoscopy coupled with endobronchial ultrasound-transbronchial needle aspirate (EBUS-TBNA) increased detection rates to 93%. However, TTNA was associated with more complications and longer delay in diagnosis versus EBUS-TBNA [18 (1-137) days vs 9 (2-99) days ($P = 0.009$)].

Discussion & Conclusion:
In most patients, the radiological abnormality found was amenable to 2 or more diagnostic modalities, providing an opportunity to choose the best first procedure for diagnosis and staging in a single attempt. TTNA and EBUS-TBNA were associated with the highest detection rates, mandating that we should direct resource allocation towards these modalities. Of these, EBUS-TBNA appears more effective, with fewer complications, earlier diagnosis, and staging.

PP-CR-97

Quality Assessment of Diagnostic Methods Employed for Suspected Lung Cancer

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Background & Hypothesis:
In diagnosing lung cancer, choosing the procedure that is safe, least invasive, and provides information about stage of the cancer is important. This study was done to assess the quality of practice patterns for diagnosing lung cancer.

Methods:
Retrospective review of patients diagnosed with lung cancer from January 2011 to December 2013 was conducted.

Results:
Intraparenchymal mass and mediastinal abnormality were the common intrathoracic radiological abnormality seen in 80 (64.5%) and 71 (57.2%) of patients respectively. TTNA was the most commonly performed procedure. No radiological difference in size and location of the mass was found in TTNA or bronchoscopy group. The yield of TTNA was higher than bronchoscopy (95% vs 68%, $P = 0.001$) and the cost per patient lower (S\$581 vs S\$1122, $P = 0.001$). However TTNA correlated with missed opportunity of nodal staging in 52.5% of patients, greater complication rate (48%), and delayed diagnosis by 14 (1-337) days. In bronchoscopy, the delay was shorter, and complication rate was lower. However, 72.7% of patients missed opportunity of nodal staging, and number of procedures needed per patient for diagnosis was higher (1.34 vs 1.05, $P = 0.02$).

Discussion & Conclusion:
Bronchoscopy was timely and a safer technique than TTNA, however needed for repeated procedures with higher cost. TTNA was more diagnostic and inexpensive than bronchoscopy but had high rate of complication, and delayed diagnosis. Reserving TTNA for small peripheral lesions without mediastinal abnormality or bronchus sign, greater adoption of convex probe EBUS-TBNA, and availability of daily TTNA were the factors identified to improve quality.

PP-CR-98

Superior Vena Cava Obstruction in Lung Cancer. Who Should Be Stented?

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Background & Hypothesis:
We aimed to evaluate the role of superior vena cava stenting in superior vena cava obstruction (SVCO) from lung cancer.

Methods:
A retrospective analysis of patients who underwent superior vena cava stenting during January 2006-August 2014 for SVCO from lung cancer was conducted.

Results:
Forty-four patients were identified with SVCO. Median age was 65 (39-83) and 31/44 (70%) were males; 73% had ECOG status of 1 and 82% had advanced stage lung cancer. Median interval between diagnosis of SVCO and stenting was 6 (1-65) days. The median survival was 8 (2-1039) days; 35 patients underwent stenting out of 44. Most common indication was shortness of breath with facial/neck swelling and distended neck/upper limb veins. No difference was seen between histological type of cancer, ECOG status, stage of lung cancer and cancer therapy in stented versus non-stented group. Survival was lower in the stented group, 68 (2-452) versus the non-stented group 104 (21-1039) days ($P = 0.42$) without reaching statistical significance. No relationship between time of stenting and survival was seen ($P = 0.22$). Within the stented group, 30 had a significantly shorter median survival after stenting of <2 months, 57 (2-179) days, whereas 5 survived for 338 (217-448) days ($P = 0.0004$). More patients 3/5 (60%) had small cell carcinoma (SCLC) and none had received radiotherapy (RT) in the longer survival group ($P = 0.06$, $P = 0.009$) respectively.

Discussion & Conclusion:
Stenting for malignant superior vena cava obstruction may provide survival benefit in patients with SCLC, or those with no prior RT. This holds true regardless of the timing of the procedure.

PP-CR-99

The Feasibility, Efficacy and Safety of a Multidisciplinary Care Pathway for Inpatient Treatment of Acute Exacerbation of Bronchiectasis

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Background & Hypothesis:
Patients admitted with acute exacerbations of bronchiectasis are a distinct population who has a significant morbidity and mortality. There are no known evidence-based clinical pathways for the inpatient management of these patients. We aimed to evaluate the safety and efficacy of an evidence-based clinical pathway specifically designed for in-hospital management of patients with acute exacerbations of bronchiectasis.

Methods:
A retrospective analysis was performed on all patients admitted with acute exacerbations of bronchiectasis between November 2013 and April 2014. Age, sex, length of hospital stay and comorbidities were established. Patients were divided into 2 groups: 1) care pathway group (CP); and 2) non-care pathway group (non-CP). The efficacy is defined as the event rate of recurrent hospitalisation with acute bronchiectasis exacerbation within 30 days postdischarge. The safety outcome is defined as the rate of mortality during the study period.

Results:
A total of 125 patients were identified; 34 patients were in CP and 91 patients in non-CP group. There were no significant differences in age, gender and comorbidities between the 2 groups. The median (IQR) length of hospital stay was significantly lower in the CP than the non-CP (4 (3-6) vs 6 (3-10) days; $P = 0.023$). The readmission rate was 9% in the CP and 20% in non-CP (P = NS). The mortality was similar in both groups (9% vs 10%, P = NS).

Discussion & Conclusion:
Our data suggests that managing patients with acute exacerbations of bronchiectasis using a clinical pathway specifically designed for this group of patients is both safe and effective in reducing hospital length of stay.

PP-CR-100

Community-Acquired Urosepsis Due to Multidrug Resistant Organisms Can Have Comparable Outcomes to Infections Caused by Non-Resistant Bacteria

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Background & Hypothesis:
Urinary sepsis is a major cause of morbidity and mortality in tertiary hospitals worldwide. We audited urosepsis cases referred to the infectious diseases team (ID) in a tertiary hospital.

Methods:
We retrospectively audited the medical records of 100 inpatients referred to ID for urosepsis. The demographics, clinical features, microbiological investigations and outcomes were analysed. Multidrug resistant organisms (MDROs) were defined according to the European Centre for Disease Control (ECDC) definitions.

Results:
Overall there were 37 males and 63 females. The median age of the patients was 61.5 (IQR; 46-72). Fever (70, 70%) and vomiting (35, 35%) were the commonest presentation. Blood cultures were positive in 61 (61%) cases. There were a total of 102 isolates from 87 patients. Eleven patients had polymicrobial infection of which 2 were by MDRO and 9 by non-MDRO. *Escherichia coli* (49%) and *Klebsiella pneumoniae* (19%) were the commonest pathogens. Overall, 17 of the isolates were quinolone resistant, 38 were third generation cephalosporin resistant, 37 were cotrimoxozole resistant, 44 were beta-lactam/beta-lactamase inhibitor resistant and 4 were carbapenem resistant. Twenty-eight patients had MDRO infections by definition. There were no significant differences in any risk factors or outcomes (0 vs 3 deaths) for patients with MDRO and non-MDRO infections.

Discussion & Conclusion:
While MDROs are increasingly common in community-acquired urosepsis and are challenging to treat, this audit shows that good outcomes can be achieved with integrated multidisciplinary management.

PP-CR-101

Patterns and Standards for Fetal Abdominal Circumference and Estimated Fetal Weight in Chinese Population

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Background & Hypothesis:
Differences in abdominal circumference (AC) and estimated fetal weight (EFW) between Chinese and Caucasian remain unknown. Therefore, we aim to construct standards for AC and EFW estimated by ultrasound scan in a Chinese population.

Methods:
This was an observational study involving 2528 Chinese pregnant women receiving antenatal care from 2009 to 2013 in Shanghai, China. Singleton pregnancies with a healthy profile defined by maternal, pregnancy and fetal characteristics and birth outcomes were selected for analysis. Gestational age was confirmed by ultrasound and EFW was estimated by Hadlock algorithm. Mixed effect model was used to construct reference standards for AC and EFW.

Results:
A linear increase of AC was observed from 16 to 35 weeks, after which the increase slightly flattened out. An accelerating increase of EFW was observed from 16 to 27 weeks, after which the increase became linear and then slowed down around 36 weeks. At 20th, 36th and 40th week respectively, median AC was similar to another central-south Chinese cohort but lower than a UK cohort, and median EFW was lower than cohorts from UK, Norway and France.

Discussion & Conclusion:
We observed a difference in AC and EFW between Chinese and Caucasians. Therefore, we suggest Chinese reference standards of AC and EFW be used for clinical purpose and research.

PP-CR-102

A Pilot Clinical Trial on a Variable Automated Speed and Sensing Treadmill (VASST) for Hemiparetic Gait Rehabilitation in Stroke Patients

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Background & Hypothesis:
Impairments in walking speed and capacity are common problems after stroke, which may benefit from treadmill training. However, standard treadmills are unable to adapt to the slower walking speeds of stroke survivors and are unable to automate training progression. This study tests a variable automated speed and sensing treadmill (VASST) using a standard clinical protocol. VASST is a semi-automated treadmill with multiple sensors and micro controllers, including wireless control to reposition a fall-prevention harness, variable preprogrammed exercise parameters and laser beam foot sensors positioned on the belt to detect subject's foot positions.

Methods:
An open label study with assessor blinding conducted in 10 community-dwelling chronic hemiplegic patients who could ambulate at least 0.1 m/s. Interventions included physiotherapist supervised training on VASST for 60 minutes, 3 times per week for 4 weeks. Outcome measures of gait speed, quantity, balance and adverse events were assessed at baseline, weeks 2, 4 and 8.

Results:
Ten subjects (8 males, mean age 55.5 years, 2.1 years poststroke) completed VASST training. Mean 10-metre walk test speed was 0.69 m/s (SD 0.29) and mean 6-minute walk test distance was 178.3 m. After 4 weeks of training, 70% had significant positive gains in gait speed (0.06 m/s, SD 0.08 m/s, $P = 0.037$); and 90% improved in walking distance (54.3 m, SD 30.9 m, $P = 0.005$).

Discussion & Conclusion:
This preliminary study demonstrates the initial feasibility and short-term efficacy of VASST for walking speed and distance for people with chronic poststroke hemiplegia.

PP-CR-103

Length of Stay, an Important Mediator of Hospital-Acquired Methicillin-Resistant *Staphylococcus Aureus*

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Background & Hypothesis:
Length of stay (LOS) and antibiotic exposure are often modelled as confounders rather than mediators when analysing hospital-acquired methicillin-resistant *Staphylococcus aureus* (HA-MRSA). The primary aim for the study was to decompose the risk factors for HA-MRSA based on conceptual clinical pathways. The secondary aim was show the amount of effect attributable to antibiotic exposure and LOS.

Methods:
The study population consisted of patients admitted to Tan Tock Seng Hospital between January and December 2006. Inclusion criteria was patients tested negative from MRSA blood culture in the previous 5 years presenting with clinical signs or symptoms of infection. A total of 600 randomly selected MRSA infections were compared with 600 non-*Staphylococcus aureus* infections. HA-MRSA was defined as positive culture 2 days after admission (n = 337). Generalised structural equation model (GSEM) was used to address the presence of intermediate variables and take into account indirect effects.

Results:
The median age was 69 years, 56% of them being male. Length of stay (aOR: 15 [8.7-25]), prior hospitalisation (aOR: 6.2 [3.3-11]) ,and cumulative antibiotic exposure (aOR: 3.5 [2.3-5.3]), directly affected HA-MRSA acquisition. LOS accounted for majority of the effects due to age (100%), male (22%), immunosuppression (67%) and surgery (96%) on HA-MRSA infection.

Discussion & Conclusion:
Our model enabled us to account and quantify effects of intermediaries. LOS was found to be an important mediator of age, immunosuppression and surgery on MRSA infection. Traditional regression approaches will not only give different conclusion but also underestimate the effects. Hospitals should minimise the LOS of patients when possible to reduce the risk of MRSA.

PP-CR-104

Glucose-6-Phosphate Dehydrogenase Deficiency and Dengue in Singaporean Males: A Case Control Study

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Background & Hypothesis:
Clinical presentations of dengue infection range from asymptomatic, non-severe to severe disease. We aim to test the hypothesis that patients with glucose-6-phosphate dehydrogenase (G6PD) enzyme deficiency may present with severe disease and hemolysis.

Methods:
We analysed a cohort of adult dengue patients treated at Tan Tock Seng Hospital, Singapore from January 2005 to December 2008. Dengue infection was confirmed by positive polymerase chain reaction or dengue serology with World Health Organization (WHO) probable dengue definition. Singaporean males with documented G6PD status were defined as cases. For each case, 3 controls were selected by matching citizenship and year of infection. Hemolysis was defined as low haemoglobin concurrent with low serum haptoglobin, or high reticulocyte or lactate dehydrogenase or bilirubin.

Results:
Compared with cases (n = 30), controls (n = 120) were significantly younger (median 26 vs 35 years, P <0.001), but had similar rates of comorbidities, hospitalisation and duration of fever at presentation (P >0.05). During their clinical course, cases had significantly higher rates of jaundice (10% vs 1%, P <0.05), serum bilirubin (median 27 vs 10 ummol/L, P <0.001), aspartate transaminase (median 148 vs 91 U/L, P <0.05), and lower hematocrit (45% vs 46%, P <0.001), haemoglobin level (13 vs 14 mg/dL, P <0.001). There was no difference in rates of dengue hemorrhagic fever (23% vs 22%, P >0.05). However, cases had higher tendency to develop severe dengue and hemolysis than controls ([23% vs 12%] and [14.29% vs 2.7%] respectively) although the difference was not significant (P >0.05).

Discussion & Conclusion:
The observed differences should be prospectively validated in larger cohorts and in different populations.

PP-CR-105

Elevation of Plasma Long-Chain Acylcarnitines in Obese Patients with Non-Remission of Type 2 Diabetes after Bariatric Surgery

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Background & Hypothesis:
Dysregulation of fatty acid oxidation plays a critical role in the pathophysiology of obesity and type 2 diabetes (T2DM). Evidently, long-chain acylcarnitine (AcylCN) species are increased in obese and T2DM individuals. Bariatric surgery is an effective weight loss surgery also known to rapidly improve diabetes remission in obese patients. We hypothesise that bariatric surgery alters plasma acylcarnitine profile differently in patients with and without T2DM remission.

Methods:
Twenty T2DM patients (mean age: 41 ± 11 years; body mass index: 41.8 ± 6.5 kg/m^2) who underwent bariatric surgery received oral glucose tolerance test pre and postsurgery. The patients were subgrouped according to their diabetes remission status. Diabetes remission was defined as fasting plasma glucose = 6.9mmol/L and 2 h postchallenge glucose = 11mmol/L. Metabolite analysis was carried out by liquid chromatography-mass spectrometry.

Results:
Diabetes remission was observed in 10 (50%) patients after bariatric surgery. The concentrations of the long-chain AcylCNs were significantly increased in the fasting (C14:1, $P = 0.007$; C16, $P = 0.005$; C18:1, $P = 0.013$) and postload (C14:1, $P = 0.022$; C16, $P = 0.007$; C18, $P = 0.007$; C18:1, $P = 0.017$) plasma of patients without diabetes remission after surgery. In contrast, diabetes-remit patients exhibited no significant change in plasma AcylCN levels postsurgery. Among the AcylCNs, change in fasting C18 (postsurgery minus presurgery) predicted change in fasting glucose after adjustment for gender, ethnicity, age, T2DM duration and body mass index (B = -0.088, $P = 0.025$).

Discussion & Conclusion:
Elevation of long-chain AcylCNs after bariatric surgery might be associated with non-remission of T2DM after bariatric surgery. Understanding metabolic changes underpinning T2DM remission will allow future non-invasive therapies to mimic surgical interventions.

PP-CR-106

Using Admitting Diagnoses to Determine Influenza Testing and Pre-emptive Isolation

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Background & Hypothesis:
Late recognition of influenza infections can result in nosocomial transmission in hospitals with high bed occupancy. We sought to determine admitting diagnoses predictive of influenza infection, by assessing diagnoses on admission from the emergency department.

Methods:
We conducted a case control study in a 1500-bed adult tertiary care hospital in Singapore, from 1 January 2010 to 31 March 2015. Cases were inpatients with positive influenza PCR tests; controls were inpatients with negative tests. Demographic and clinical data were obtained via electronic linkages of databases.

Results:
Of 40,516 inpatients tested, 4924 (12.2%) were confirmed with influenza. Two-thirds of influenza patients were aged ≥65 years. Pneumonia (ICD-9 480-487) and unspecified infectious diseases (ICD-9 136) contributed to 42% of admitting diagnoses for influenza-positive patients. General symptoms (ICD-9 780) accounted for another 11%. After adjusting for age, gender, and year of admission, an admitting diagnosis of general symptoms (OR 2.09, 95% CI 1.86-2.34, P <0.001), unspecified infectious diseases (OR 1.51, 95% CI 1.37-1.65, P <0.001), pneumonia (OR 1.29, 95% CI 1.17-1.41, P <0.001), and other non-airway respiratory diseases (OR 1.78, 95% CI 1.57-2.01, P <0.001), were positively associated with influenza infection. A diagnosis of chronic obstructive pulmonary disease was negatively associated (OR 0.83, 95% CI 0.73-0.94, P = 0.005). For patients aged ≥65 years, asthma was also positively associated with influenza infection (OR 1.37, 95% CI 1.15-1.63, P = 0.001).

Discussion & Conclusion:
Besides pneumonia and non-airway respiratory diseases, patients presenting with general symptoms and unspecified infectious diseases should be actively tested for influenza and pre-emptive isolation considered, particularly when approaching influenza seasons.

PP-CR-107

Hospital-Onset Influenza Hospitalisations in Adult Tertiary Care Hospital in Singapore, 2013-2014

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Background & Hypothesis:
Healthcare-associated influenza (HAI) is associated with significant morbidity and mortality in hospitalised patients.

Methods:
We conducted a retrospective review study on all patients admitted with laboratory-confirmed influenza from January 2013 to December 2014. We analysed the potential risk factors associated with hospital-onset (HO) influenza cases (positive PCR >3 days after admission) compared with community-onset (CO) cases (positive PCR ≤3 days after admission).

Results:
A total of 2442 inpatients were confirmed with influenza in the study period: 54.2% – influenza A/H3, 26.1% – influenza B, 13.2% – influenza A/H1N1-2009, and 6.5% – influenza A/subtype-undetermined. The study population was predominantly elderly (66% aged >65 years) with equal gender distribution; 93% had Charlson comorbidity score <3. Ninety-five (4%) were HO influenza cases. On univariate analysis, HO and CO cases did not differ by age ($P = 0.116$) or gender ($P = 0.766$). On multivariate analysis, factors independently associated with HO cases were presence of congestive heart failure (CCF) (AOR 3.53, 95% CI 1.95-6.40), cerebrovascular disease (AOR 4.64, 95% CI 1.50-14.32) and any malignancy (AOR 7.08, 95% CI 2.77-18.13). Chronic pulmonary disease (AOR 0.30, 95% CI 0.13-0.70) appeared to protect against HO influenza. After adjusting for ethnicity and other medical comorbidities in a multivariable logistic regression model, predictors for in-hospital all-cause mortality were age (AOR 1.03, 95% CI 1.01-1.05), male gender (AOR 1.54, 95% CI 1.001-2.36), CCF (AOR 3.84, 95% CI 2.21-6.66), HO cases (AOR 3.0, 95% CI 1.55-5.81) and LOS after influenza diagnosis (AOR 1.02, 95% CI 1.01-1.03).

Discussion & Conclusion:
Chronic conditions increase the risk of hospital-onset influenza which is associated with poorer clinical outcome.

PP-CR-108

Predictors of Severely Ill and Fatal Influenza, Singapore, 2011-2014

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Background & Hypothesis:
Influenza is associated with substantial morbidity and mortality.

Methods:
We performed a case control study using patients from January 2011 to December 2014. Cases were severely ill influenza cases who required intensive care and/or died. Controls were randomly selected from inpatient population, matched by admission year. We analysed the potential clinical risk factors associated with severely ill cases and in-house mortality.

Results:
We identified 289 cases and selected 867 controls. The study population was predominantly elderly (67% aged ≥65 years) and male to female ratio was 1.1:1; 92% had Charlson score <3. Cases and controls did not differ by age ($P = 0.860$) and gender ($P = 0.072$). Cases were more likely to have influenza A/H1N1-2009 ($P = 0.010$), nosocomial influenza (influenza positive 3 days after admission) ($P < 0.001$) and higher Charlson score ($P < 0.001$). After adjusting for age, gender and recent hospitalisation, factors associated with severely ill influenza were influenza A/H1N1-2009 (AOR 1.84, 95% CI 1.23-2.76), nosocomial influenza (AOR 3.19, 95% CI 1.72-5.91), cerebrovascular disease (AOR 3.24, 95% CI 1.99-5.29), congestive heart failure (AOR 3.91, 95% CI 2.70-5.67), renal disease (AOR 2.29, 95% CI 1.48-3.54) and any malignant tumour (AOR 4.01, 95% CI 1.99-8.07). Predictors of in-hospital all-cause mortality were age ≥65 years (AOR 2.17, 95% CI 1.43-3.29) and Charlson score (AOR 1.62, 95% CI 1.46-1.80) after adjusting for gender, hospitalisation within the past 6 months and influenza subtypes.

Discussion & Conclusion:
Nosocomial influenza cases were more likely to become severely ill, and increasing age amongst older individuals was an independent predictor of fatality.

PP-CR-109

Burden of Community-Acquired Influenza in a Tertiary Hospital

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Background & Hypothesis:
Influenza circulates year-round in Singapore with bimodal peaks around the southern and northern hemisphere influenza seasons. While influenza is a self-limiting illness, it can lead to complications and hospitalisations.

Methods:
We describe the inpatient burden of community-acquired influenza admissions (CAIA) in a 1500-bed adult tertiary care hospital from 1 January 2010 to 31 December 2014. We define CAIA as presence of positive laboratory test for influenza within 2 days after admission. Demographic and clinical data were obtained through electronic linkages.

Results:
There were 4725 CAIA admissions during the study period. The median age was 73 years old but 34.7% of the cases were less than 65 years old. Gender distribution was equal. The most frequent admitting diagnosis was pneumonia (ICD-9 code 486) which accounted for 21.5% of all admitting diagnoses. The median length of stay was 5 days; 30.8% of the admissions lasted more than 7 days. These admissions resulted in 39,791 person-days in total. The admissions were distributed in a bimodal pattern. The May-July peak accounted for 41.9% of CAIA and the November-January peak another 24.3%; 3.6% of CIA resulted in death. Influenza A/H3 accounted for 50.3% of the CIA, followed by influenza B (27.3%) and influenza A/H1N1 2009 (17.5%); 4.9% of CIA were influenza A viruses whose subtype could not be determined.

Discussion & Conclusion:
Influenza admissions poses significant burden to our hospitals. There are 2 peaks in CAIA that correspond to northern and southern hemisphere influenza season. Influenza vaccination can be an important strategy to reduce CAIA.

PP-CR-110

Factors in Proximal Femoral Nail Antirotation (PFNA) Failures

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Background & Hypothesis:
Proximal femoral nail antirotation has been accepted as an implant of choice for intramedullary fixation of unstable and potentially unstable intertrochanteric fractures. There are few studies which calculate the fixation failure predictors in fractures fixed with PFNA.

Methods:
A total of 127 cases of intertrochnateric fractures fixed with PFNA in the year 2011-2 were included in the study as a retrospective analysis. Minimum follow-up was defined as till fracture union or failure. Subtrochanteric and pathological fractures were excluded from the study. Tip apex distance (TAD), neck shaft angle and blade position in neck was measured in the intraoperative images or immediate postoperative X-rays in the CPACS systems. Demographic data was collected on patient age and AO classification of fractures.

Results:
When the TAD was compared in ranges, there was a statistically significant difference in the frequency of cutout between TAD of more than 28 mm and less than 28 mm. Age and AO classification were not significant predictors of cutout. The neck shaft angle was significant in predicting cutout ($P = 0.03$), with varus neck shaft angles less than 132.7 with the highest specificity and sensitivity for predicting cutout.

Discussion & Conclusion:
Our findings suggest that varus neck shaft angles less than 132.7 degrees as well as a TAD of more than 28 mm are associated with a higher incidence of blade cutout. More data needs to be collected to further refine the ideal TAD and neck shaft angle.

PP-CR-111

Challenges in the Development of Investigator-Initiated Trial in Addiction Medicine

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Background & Hypothesis:
National addictions management service (NAMS) is a tertiary care provider which specialises in addictions. In the course of improving treatment while considering the patients' needs and welfare, research is required to inform and educate clinicians on the next best step. Investigator-initiated trials (IITs), as compared to those by pharmaceutical companies, are preferred as they emphasise scientific ideas over marketing agenda, avoiding conflict of interests.

Methods:
The lofexidine trial is NAMS' first IIT. It adopts a double-blind, double-dummy inpatient phase-IV approach to compare the efficacy of lofexidine and diazepam in the management of opioid withdrawal. However, there are several challenges in the process. They include obtaining of funds and difficulty in the execution of complex study design due to the study team's minimal experience with clinical trials. While many IITs in other fields also face recruitment and retention difficulties, these challenges are particularly so for substance abuse.

Results:
Given that Singapore adopts a zero-tolerance stance towards substance use, many potential patients face legal concerns which affect their motivation to come forth and their eventual attendance for treatment. Opiate-assisted detoxification done overseas have been proven to improve retention in treatment. Hence, the unavailability of opiate-assisted detoxification locally is expected to further strain the retention of patients in this study.

Discussion & Conclusion:
These obstacles cannot be easily overcome with design and external control. With that, statistical consideration was given to address these concerns. Intensive training was also carried out prior to the start of the trial and whilst the study was ongoing to ensure protocol compliance.

PP-CR-112

A Retrospective Study Looking at the Sociodemographic Profile of Patients with First Episode of Acute Psychosis and Mania

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Background & Hypothesis:
Many patients with first episode of acute psychosis and mania in Singapore presents to the emergency room of Institute of Mental Health (IMH) which is the only tertiary psychiatric hospital in Singapore. Many of these patients are sent out to general hospitals for organic workup including neuroimaging. Profile of these patients had not been studied locally. Studying the profile of these patients can help identify the groups of people who are at risk of having the latter conditions. We aimed to examine the sociodemographic and clinical profile of patients with first episode of acute psychosis and mania.

Methods:
This is a retrospective study with information obtained only from electronic medical records and case notes of IMH. Data for all patients diagnosed to have first episode of acute psychosis or mania presenting to the emergency room of IMH in 2012 were collected. A semi-structured data collection form was used to collect details regarding sociodemographic and clinical data.

Results:
There were a total of 217 patients included in this study; 56.2% of them were foreigners, people on work permits such as construction workers and domestic workers. The rest are locals – Singapore citizens/permanent residents; 27.2% of all 217 patients worked as foreign domestic workers.

Discussion & Conclusion:
This appears to show that foreign workers (especially FDW) are at higher risk of developing first episode of acute psychosis or mania. This is consistent with a recent survey conducted by the Humanitarian Organisation for Migration Economics that more than 2 out of every 10 FDW (24%) suffer from poor mental health.

PP-CR-113

Lumbosacral Plexopathy in Pelvic Injury – A Cause of Hip Instability in Acetabular Fractures

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Background & Hypothesis:
Lumbosacral plexopathy is a rare clinical entity that results in potentially severe neurological deficit. The clinical presentation of lumbosacral plexopathy includes motor and sensory deficits. To the best of our knowledge, hip instability secondary to lumbosacral plexopathy has not been reported in current literature. We believe this is due to inadequate hip muscle tension from the associated lumbosacral plexopathy.

Methods:
We report 2 cases of pelvic injury in which recurrent hip subluxation followed open reduction and internal fixation of acetabular fractures. Both cases were followed up for at least 6 months following surgery. Electromyographic studies were done to demonstrate lumbosacral plexopathy.

Results:
Both patients developed recurrent hip instability secondary to lumbosacral plexopathy. X-rays demonstrated subluxation of the femoral head in both patients. The first patient was initially managed conservatively to allow the plexopathy to recover before proceeding with a total hip replacement (THR). He recovered well post-THR. The second patient underwent a revision ORIF of his acetabular fractures. He was managed conservatively while awaiting his acetabular fracture to unite and plexopathy to recover. He was eventually counselled for a THR.

Discussion & Conclusion:
Patients with acetabular fractures and pelvic injury may have varying degrees of lumbosacral plexopathy. In patients with acetabular fractures, this may lead to debilitating hip joint instability. Both cases illustrate the poor prognosis associated with this combination of neurological and bony injury, with the inevitable development of post-traumatic hip joint arthropathy requiring THR. Careful planning for surgery after complete resolution of the neurological injury is advised to reduce postarthroplasty complications.

PP-CR-114

Examining the Impact of Nutrition on Physical Performance and Sarcopenia in Functionally Independent Community-Dwelling Older Adults

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Background & Hypothesis:
The impact of nutrition on sarcopenia (age-related loss of skeletal muscle mass and strength) beyond mere muscle mass remains unclear. This study examines the influence of nutritional status on physical performance, muscle mass and sarcopenia in older adults.

Methods:
We recruited 200 functionally-independent adults = 50 years. Nutritional status was assessed, with subjects classified as normal, at-risk of malnutrition or malnourished. Physical performance was assessed on Short Physical Performance Battery (SPPB, score = 8 defined as poor performance), 4.5 m gait speed, grip and knee extension strength. Sarcopenia was defined using Asian Working Group for Sarcopenia. Serum albumin, lipid profile, vitamin D and lean muscle mass on DEXA were measured. We examined the relationships between nutritional status with outcome variables of physical performance measures and sarcopenia.

Results:
Fifty (25%) subjects were sarcopenic, and they were significantly older (72.0 + 8.1 vs 66.6 + 7.3, P <0.001); 14 (7%) of subjects were at risk of malnutrition and none malnourished. Sarcopenia was associated with lower body mass index (21.7 + 2.4 vs 24.7 + 3.8, P <0.001), lower triglyceride level (P <0.001) and risk of malnutrition (14% vs 4.7%, P = 0.025). While strength and muscle mass were similar between subjects of different nutritional status, the at-risk group exhibited trend for slower gait speed (P = 0.089), and poor SPPB (14.3% vs 3.8%, P = 0.067). In multiple logistic regression adjusted for age, being at-risk of malnutrition was associated with 2.37 higher odds for sarcopenia (P = 0.157, 95% CI 0.72-7.86).

Discussion & Conclusion:
Amongst functionally independent older adults, being at risk of malnutrition confers risk for sarcopenia, with poorer physical performance despite similar muscle mass.

PP-CR-115

Switch-Control Radiofrequency Ablation With and Without Chemoembolisation for Hepatocellular Carcinoma of 3.1-7 cm

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Background & Hypothesis:
This randomised-controlled trial compares clinical efficacy of combining transarterial chemoembolism (TACE) and switch-control radiofrequency (SWC-RFA) versus SWC-RFA alone for hepatocellular carcinoma with size of 3.1-7 cm.

Methods:
The primary aim is to examine the clinical outcome in terms of primary technical effectiveness, overall survival analysis and progression-free survival. Hospitalisation days, readmission rate and major complications were also reviewed.

Results:
Twenty-nine patients were recruited into the combination TACE/SWC-RFA cohort (mean tumour size 4.51 cm, maximum 6.6 cm) and 26 patients into the SWC-RFA-only cohort (mean tumour size 4.18 cm, maximum 5.8 cm). No statistically significant difference was noted in clinical outcome, with both groups achieving near 90% complete remission. Both cohorts recorded clinical complications with more major complications observed in the combination TACE/SWC-RFA cohort. At the end of the study, mortality rate was 7 patients (26.92%) in the SWC-RFA cohort and 4 patients (13.33%) in the combination TACE/SWC-RFA cohort. Log rank test on overall survival analysis revealed no significant difference between the 2 groups ($P = 0.4751$). The tumour-free survival at 6 months, 1 year and 2 years was SWC-RFA only at 84%, 68%, 48% and combination TACE/SWC-RFA at 79.31%, 55.17%, 31.03% ($P = 0.1682$).

Discussion & Conclusion:
The study demonstrated equivalent clinical outcome between TACE/SWC-RFA and SWC-RFA-only cohort. However combination TACE/SWC-RFA therapy was associated with more severe clinical complications. Hence SWC-RFA-alone may be a sensible alternative treatment procedure in HCC with mean tumour size of 4 cm and perhaps larger size with various ablation outcome.

PP-CR-116

Serum a-Klotho Levels in Diabetes Mellitus with Chronic Kidney Disease

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Background & Hypothesis:
Klotho is an upcoming biomarker arising from renal tubules and purported to correlate well with renal function. This is a pilot study to look at serum a-Klotho concentrations in Malay and Indian diabetics with varying stages of chronic kidney disease.

Methods:
We measured serum a-Klotho concentration in 25 diabetic outpatients (and 6 non-diabetic controls) using IBL enzyme-linked immunosorbent assay (ELISA), and reviewed the demographics as well as laboratory parameters (lipid results, HbA1c, urinary albumin:creatinine ratio (UACR) or protein:creatinine ratio (UPCR), creatinine and estimated glomerular filtration rate (eGFR) using CKD-EPI equation). Statistical analysis was done using Microsoft Excel and SPSS v17.0.

Results:
There were 24 Malay and 7 Indian patients with median age 59 years old and male:female ratio of 1:1. There were 24 and 6 patients with CKD stages 1-3 and 4-5 respectively, with 1 patient without a recent creatinine measurement. Klotho levels correlated well with creatinine and eGFR, but not with UACR/UPCR. Median Klotho for diabetics was 537.8 pg/ml and similar to non-diabetics. Median Klotho concentration for CKD stages 1-3 were higher than those with CKD 4-5 (746.7 and 450.5 pg/ml respectively, *P* <0.05). Median Klotho were higher in patients on ACE or ARB treatment (566.5 versus 509.9 pg/ml), and in males compared to females (556.9 versus 510.0 pg/ml).

Discussion & Conclusion:
Serum Klotho concentrations have a decreasing trend in Malay and Indian diabetic patients with worsening renal function in our pilot study. Further studies with more patients and longitudinal follow-up will be helpful to delineate the relationship better.

PP-CR-117

Assessment of Choroidal Thickness in Diabetic Patients Undergoing Cataract Surgery: An Enhanced Depth Imaging Study

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Background & Hypothesis:
Diabetic retinopathy is a leading cause of blindness worldwide. In routine cataract surgery, patients with diabetes tend to have poorer outcomes. Recent studies found that diabetic eye disease was associated with changes in choroidal thickness (CT). We aim to study the effects of cataract surgery on CT in diabetics.

Methods:
This is a prospective case controlled study of 15 diabetic and 17 non-diabetic patients undergoing cataract surgery. Enhanced depth imaging optical coherence tomography (OCT) scans of the macula were performed using spectral-domain OCT before and after surgery, at 1 and 3 months. Horizontal 6 mm line scans centred on the fovea were obtained. The CT was measured at 3 points (subfoveal, 500 microns temporal and nasal to the fovea). The CT between subjects and controls were compared using the independent samples T-test, and the differences in CT within groups were compared using repeated measures ANOVA, and Bonferroni posthoc pairwise comparisons done if the overall ANOVA results were statistically significant ($P <0.05$).

Results:
The mean age of the patients was 68.8 years ($\pm$ 6.5 SD). All patients had increased CT following surgery (diabetics: 150.7μm vs 163.8μm, $P = 0.043$; controls: 177.9μm vs 200.0μm, $P = 0.011$). The CT in diabetics was thinner than controls (visit 1: 152.8μm vs 195.0μm, $P = 0.037$; visit 2: 150.7μm vs 199.5μm, $P = 0.024$; visit 3: 151.7μm vs 194.2μm, $P = 0.038$).

Discussion & Conclusion:
There was an increase in CT following cataract surgery in both diabetic and non-diabetic patients. Diabetic patients also had thinner choroids than controls.

PP-HPE-01

Mortality and Morbidity Workshop for Medical Fellows

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Background & Hypothesis:
Medical fellows are expected to perform at level 5 of the milestones for System-based Practice. This entails reporting adverse events, conducting root cause analysis (RCA) and finding solutions to patient safety problems. The M&M workshop seeks to facilitate self-directed and peer learning using a systematic approach towards analysing an adverse event through incorporating human factors and systems thinking.

Methods:
The M&M workshop is an interactive small group, case-based discussion of a medical case involving patient mortality resulting from multiple failed care processes. Participants applied the knowledge from the preworkshop reading materials to determine the severity of the adverse event, formulate causal statements using RCA process tools, generate actionable improvements using human and system factors. The facilitator guided the medical fellows to adopt systems thinking during the workshop.

Results:
Thirty-six medical fellows attended the workshop. Preworkshop, 72% of them were somewhat satisfied with their existing quality improvement (QI) training, 68% and 28% had attended the patient safety and QI courses respectively, 78% had identified and reported errors in patient care, 56% were involved in the M&M rounds and only 17% were involved in RCA of an actual adverse event. Postworkshop, 97% of them felt that the workshop was interesting and relevant, 91% were confident in conducting RCA and completing M&M reviews. All postworkshop assignments (40% submitted) were considerably better than the preworkshop assignments.

Discussion & Conclusion:
The M&M workshops have helped medical fellows to think beyond their clinical role and equipped them with a system perspective to improve patient care. The next important step would be to look at motivating them to initiate QI projects.

PP-HPE-02

Frameworks and Utilisation of the Clinical Decision Support System (CDSS): A Critical Review

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Background & Hypothesis:
The Clinical Decision Support System (CDSS) is believed to support healthcare professionals to practise evidence-based medicine. Many studies have been conducted to understand factors that influence utilisation of the CDSS. The findings of these studies were diverse and inconsistent. This review aimed to identify the guiding frameworks to explore healthcare workers' acceptance and use of the CDSS so as to reveal possible gaps that can inform future study.

Methods:
An extensive search was made and studies that met the initial selection criteria were critiqued. A total of 16 articles were critically reviewed after an intensive appraisal using the Critical Appraisal Skills Programme (CASP) framework.

Results:
The review identified 15 theoretical and conceptual frameworks used in hybrids. The Technology Acceptance Model was the most commonly used baseline framework combined with other frameworks such as the Diffusion of Innovation, and et cetera. The review yielded multiple concepts and factors which were recondensed into 9 concepts that were, the information system, person (user or patient), social, organisation, perceived benefits, emotions, trust-ability, relevance (fit-ness) and professionalism.

Discussion & Conclusion:
Ostensibly, none of the articles reviewed found all the 9 concepts. That said, most of them have identified the factors related to the information system, organisation and person concepts as the leading concepts influencing the acceptance and use of the CDSS. The factors within each of the concepts were markedly different, highlighting the multifaceted issues related to utilisation of the CDSS. A proposed pluralistic framework was constructed to serve as an overarching framework for future study on adoption of the CDSS.

PP-HPE-03

Bridging Knowledge Gaps among Doctors

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Background & Hypothesis:
Alcohol withdrawal (AW) and delirium tremens (DT) are not uncommon conditions in a general hospital. Knowledge gaps among physicians on how to identify exist.

Methods:
The Department of Psychological Medicine, Tan Tock Seng Hospital created an e-learning module to target knowledge gaps in: 1) theoretical aspects of pathophysiology, identification, investigations, management, monitoring of patients with AW/DT; and 2) a series of 3 videos that demonstrate the progression of AW/DT and how to score the Clinical Institute of Withdrawal-Alcohol scale (CIWA-Ar) based on severity of withdrawal. Pre- and post-test scores were obtained in the form of 10 multiple choice questions (MCQs) and assessments of severity of AW based on a series of videos were made using CIWA-Ar charting.

Results:
Seventy-seven doctors completed pre- and post-test MCQs. Full marks indicated score of 10, mean pre-test MCQ score was 7.2 compared to 8.9 post-test with a mean increase of 1.7 points. Improvement in scores was seen in 83% (n = 64). Sixty-eight doctors completed the pre- and post-test assessments for assessing severity of AW using CIWA-Ar charting. Fourty-three (63%) and 53 (78%) categorised the severity of AW correctly during the pre- and post-test assessments respectively. More than half (51%, n = 35) categorised the severity of AW correctly for both pre- and post-test assessments. Of those that categorised the severity of AW incorrectly during the pre-test assessment (n = 25, 37%), 72% (n = 18) categorised it accurately at the post-test on a repeated attempt.

Discussion & Conclusion:
The e-learning module was effective in bridging knowledge gaps.

PP-HPE-04

The Pilot Use of a Qualitative Patient Feedback Form for Physiotherapy Trainee

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Background & Hypothesis:
Clinical education involves mentorship and experience building. The judgment among mentors varies and can be subjected to bias. The use of patient feedback form could help address the mentor bias and also provides immediate feedback to both the trainee and mentor.

Methods:
A total of 39 patients with musculoskeletal conditions were managed by a physiotherapy trainee during a 5-week placement in the National Healthcare Group Polyclinics physiotherapy centre. An anonymous feedback form was given to each patient who was willing to provide written feedback. The 3 sections are 'Commendations for trainee', 'Areas to improve for trainee', and 'How the educator could improve'. Only constructive feedbacks were pooled and categorised to common terms.

Results:
A total of 24 patients provided constructive feedback and 1 patient gave general feedback (64%). The trainee was a challenge because of major weakness in communication (n = 6) and confidence (n = 5) in the first 4 weeks, similar to the awareness of the mentors. Nonetheless, the trainee's main strengths included competence (n = 18) and empathy (n = 18). The formative assessment supported a pass grade for the trainee, which the mentors had originally felt otherwise.

Discussion & Conclusion:
The preliminary study findings showed that the use of qualitative patient feedback provided immediate constructive feedback to the trainee and was useful as a formative feedback. Majority of the patients who provided feedbacks were constructive. The patients were blinded to the discussion of the mentor and trainee at different intervals of the session and hence the patients might have over-rated on the trainee's competence.

PP-HPE-05

Resident/Senior Resident Training in General Medicine during an Inpatient Rheumatology Rotation

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Background & Hypothesis:
We aimed to study the amount of general medicine exposure and training internal medicine residents and rheumatology senior residents receive when rotating to a rheumatology, allergy and immunology (RAI) inpatient service.

Methods:
Retrospective audit of the demographic profile and diagnoses of all RAI inpatients admitted to Tan Tock Seng Hospital from 1 January to 31 March 2015 was performed.

Results:
There were 157 patients with 183 admissions, of whom 65% were female; and 65.6% Chinese. Elderly aged ≥65 years comprised 31.2% of admissions. The average length of stay (ALOS) among the elderly was 4.9 ± 5.0 days and non-elderly 4.0 ± 3.9 days. Systemic lupus erythematosus (SLE) (20.8%), rheumatoid arthritis (RA) (13.1%), Sjogren's syndrome (8.2%), gout (6.6%) and inflammatory myopathies (6.6%) were the most common rheumatological conditions. Eight patients were newly diagnosed with connective tissue disease (5), inflammatory myopathy (2) and inflammatory arthritis (1) following an undifferentiated presentation. General medical conditions requiring active management were most commonly related to infectious diseases (22.4%), dermatology (17.5%), nephrology (14.2%), cardiology (13.7%), gastroenterology/hepatology (12%), pulmonology (12%), haematology (10.4%) and endocrinology (9.3%). Oncology and palliative medicine encounters were less frequent (<2%). Hypertension (23.5%), hyperlipidaemia (16.4%), type 2 diabetes mellitus (13.7%), osteoporosis (13.1%), chronic kidney disease (11.5%) and anaemia (9.8%) were the most frequent comorbidities managed.

Discussion & Conclusion:
Residents/senior residents encounter a wide range of general medical conditions among elderly and non-elderly patients during their inpatient rotation. Knowledge, training and competencies in general and geriatric medicine can be acquired when managing rheumatology inpatients with multiple organ-systems involvement and comorbidities.

PP-HPE-06

Virtual Reality Environments for Pre and Postregistration Health Professional Education. What's the Evidence Base?

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Background & Hypothesis:
Currently, there is a paucity of healthcare professionals worldwide, especially in developing countries. Addressing the shortfall through adequate training requires innovative methods to reach out to a large population. This study focuses on virtual reality environments (VRE) as e-learning interventions for healthcare professionals (HCPs) highlighting the increasing evidence base for VRE as an e-learning modality.

Methods:
A Cochrane systematic review was conducted to synthesise the evidence on VRE as education tools for HCPs. Medline (Ovid), Embase (Elsevier), Cochrane (Wiley), Psychinfo (Ovid), ERIC (Ovid), Cinahl (Ebsco) and Web of Science Core Collection (Thomson Reuters) were searched for studies on VRE from 1990 to 2015. Only randomised controlled trials (RCT) or cluster RCTs were included. The number of studies by year of publication and type of participants was quantified.

Results:
The search strategy yielded 21,846 RCTs and cRCTs on e-learning for HCPs. Of these, 2668 articles were included for full text screening with 72 articles fulfilling our inclusion criteria for VRE. Only 1 article was published in 1997. Close to 60% of the articles were published in the last 5 years (2011-2015). Thirty-seven articles focused on preregistration medical doctors, 12 on undergraduate allied health professionals, 16 on postregistration medical doctors while 3 articles focused on postregistration healthcare professionals other than medical doctors.

Discussion & Conclusion:
Preliminary results suggest that there has been an exponential increase in the number of studies focusing on VREs as e-learning tools for HCPs. Detailed analysis from the systematic review will give further insights into effectiveness and ease of implementation.

PP-HPE-07

The Professional for Tomorrow's Healthcare (PTH) – A Model for Healthcare in the 21st Century

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Background & Hypothesis:
Healthcare systems worldwide face unprecedented challenges in the 21st century. Many countries have embarked on healthcare reforms as current systems of healthcare delivery are unsustainable. Before reforms can be instituted, however, an understanding of key capabilities needed in the future is necessary. To address this, the National Healthcare Group sought views of educators from various healthcare sectors on the capabilities needed in a healthcare worker of the future.

Methods:
Small group discussions were held with various stakeholders in the National Healthcare Group (NHG) Singapore. These included educators (encompassing undergraduate, preprofessional, postgraduate and allied health education) and practitioners (clinicians, nurses, allied health professionals). Participants were asked to list capabilities that would be important to function in healthcare in the future.

Results:
The capabilities articulated during discussions were grouped and distilled to 5 components. These are similar to those in an equation developed by Sir Michael Barber, in 2009. The equation developed by NHG describes the attributes of the ideal Professional for Tomorrow's Healthcare (PTH): PTH E [(K1 + K2) x F x L] Where E represents ethical and professional conduct; K1 and K2 stand for core (professional) and systems knowledge, respectively; F represents future-oriented thinking and L stands for engaging leadership skills.

Discussion & Conclusion:
The PTH equation will be an invaluable aid to align education and service goals in healthcare institutions. The capabilities sketched out here, though not exhaustive, are an important part of an ongoing discourse on articulating the important capabilities that will serve healthcare in the 21st century.

PP-HPE-08

Nurses' Attitudes and Knowledge on Physical Restraints Use at Pre and Postworkshop in Singapore Nursing Homes

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Background & Hypothesis:
The prevalence of physical restraints use has been reported to be high in nursing homes of Singapore. This study examines nursing students' pre-post workshop perceived importance and knowledge regarding the use of physical restraints.

Methods:
The iCARE workshop uses interactive lecture and experiential learning approaches in understanding dementia, encouraging reflection, and managing change in behaviour. The experiential activity allows the participants to experience what it was like to be physically restrained and to depend on others for care. Twelve participants rated pre-post importance of using physical restraints for various reasons using a tool adapted from the Perception of Restraint Use Questionnaire (PRUQ). Ten true/false statements were designed to assess pre-post knowledge. In addition, the survey included a 4-item questionnaire for the nurses to rate their feelings using a 4-point scale.

Results:
More participants perceived physical restraint use as not important at postintervention for the following reasons: substituting for staff observation (-75%), preventing residents from taking things from others (-50%), and preventing residents from falling out of bed (-17%). Reasons perceived as important were: protecting staff or other persons from physical abuse (+16%), and managing agitation (+16%). The average pre-test score was 54% correct while the post-test results showed a correct response of 88%. Most nurses expressed frustration (80%) and helplessness (75%) when they applied physical restraints on residents. However, most (78%) felt that it was justified.

Discussion & Conclusion:
The workshop has helped to improve nurses' knowledge. Physical restraint use is perceived as more important in mainly limiting challenging behaviour.

PP-HPE-09

Online e-Learning for Postregistration Healthcare Professionals - A Bibliographic Analysis of the Literature

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Background & Hypothesis:
Online e-learning such as continuing medical education (CME) and continuing professional development (CPD) has been used widely as a mode to train healthcare workforce and to enhance patient care. This study is a bibliographic analysis of literature on this topic.

Methods:
A systematic review is underway to synthesise evidence on online e-learning for healthcare professionals (HCPs). Medline (Ovid), Embase (Elsevier), Cochrane (Wiley), Psychinfo (Ovid), ERIC (Ovid), Cinahl (Ebsco) and Web of Science Core Collection (Thomson Reuters) were searched for studies on online eLearning for postregistration professionals from 1990 to 2015. Only randomised controlled trials (RCT) or cluster RCTs were included.

Results:
Of the 2668 articles included for full text screening, 252 fulfilled our inclusion criteria; 55% of these articles were published in the last 5 years, and the number of articles has increased by 278% from 2004-2014. The years 2012 (n = 43) and 2013 (n = 35) had the highest numbers of articles. The 252 included articles were published in 172 journals, of which 43 journals published 2 or more articles. The majority of these studies were conducted among doctors (52%) and nurses (26%) and were published in the surgical (8%), paediatric (8%), emergency medicine (5%) and nursing journals (5%). Among the doctors, 58% physicians, 17% surgeons, 15% paediatrics, 5% each from obstetrics and gynaecology and psychiatry.

Discussion & Conclusion:
There is a substantial body of evidence on use of online e-learning for training postregistration professionals, specifically doctors. However, its effectiveness and quality of evidence is yet to be ascertained.

PP-HSR-1

"You've Got Mail!" – Increasing Compliance with Hand Hygiene Measures

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Background & Hypothesis:
Hand hygiene is the primary method for preventing the spread of healthcare-associated infections, and for reducing antimicrobial resistance; however, rates of compliance with optimal hand hygiene practices among healthcare workers remain low.

Methods:
This was a pilot study conducted over a 1-year period (April 2014 to April 2015) investigating the effectiveness of email and short messaging service (SMS) text message reminders on compliance with hand hygiene measures among healthcare workers in a 36-bed, mixed-gender, subsidised-care ward in a busy hospital. On the first and third week of their month-long rotation, healthcare workers assigned to that ward received a hand hygiene reminder. In the first week, the reminder comprised 1 email and 1 text message; in the third week, they received a text message reminder. To track hand hygiene compliance rates, unobtrusive direct observation methods were employed, in accordance with World Health Organization guidelines on hand hygiene monitoring and feedback.

Results:
Our preliminary results show that, on average, with email and text message reminders, compliance rates with hand hygiene measures was 46.5%. However, without email and SMS reminders, compliance rates were only 27%.

Discussion & Conclusion:
This pilot study shows promising results in the use of email and SMS reminders to increase compliance rates with hand hygiene measures. It is easily implemented, especially in healthcare settings in urban areas where smart phone ownership among healthcare staff is high and where the cost of such technology is reasonable.

PP-HSR-2

Diabetic Patients' Knowledge about Diabetes Mellitus and Hypoglycaemia: A Follow-Up Study after 10 Years

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Background & Hypothesis:
Despite decades of effort by Ministry of Health (MOH) Singapore on diabetes mellitus (DM), it is still the second heaviest disease burden. One of the efforts is the use of HbA1c to monitor DM control, perhaps leading to an increase incidence of hypoglycaemia. In 2004, a study showed that DM patients' knowledge about their disease and complications had room for improvement. The objectives of this study are to determine if there is an improvement of DM knowledge compared to 2004, and to determine knowledge of hypoglycaemia among DM patients.

Methods:
This is a cross-sectional study using convenient sampling carried out in Tan Tock Seng Hospital Emergency Department (ED). DM patients who met inclusion criteria were recruited and non-DM patients who matched for age, gender and race were recruited for control for questionnaire survey. The questionnaire was similar to the 2004 version with a maximum score of 43 with additional hypoglycaemia questions.

Results:
A total of 100 diabetics and 100 non-diabetics were surveyed. The DM patients' and non-DM patients' mean score was 34.9/43 and 29.7/43 respectively (P <0.001), and compared to mean of 29.2/43 among diabetics in 2004. DM patients' score (5.2/6) was significantly higher than that for non-diabetics (3.6/6) for hypoglycaemia knowledge (P <0.001). Counselling significantly improved diabetic knowledge (P = 0.005) but not hypoglycaemia knowledge (P = 0.15) among diabetics.

Discussion & Conclusion:
Diabetics' DM knowledge has improved significantly over 10 years. Their hypoglycaemia knowledge is better than controls. The non-diabetics' knowledge currently is comparable to that of diabetics 10 years ago. These are possible returns on MOH's investment in improving DM.

PP-HSR-3

Accessibility of Care for Prosthetics and Orthotics Patients in Singapore

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Background & Hypothesis:
The health delivery landscape in Singapore is continually evolving. As healthcare providers, it is important to provide the rightsiting of services to provide direct access to care such as prosthetics and orthotics (P&O). The objective of this study was to identify the level of accessibility of P&O services based on the patients' residence.

Methods:
Actualised P&O patient visits to Tan Tock Seng Hospital (TTSH) were extracted from Nauticus from the period of January 2012 to December 2014. Data extracted included patient demographics such as age, gender, class status, visit type, referral source and home address. The data was matched with GeoSpace and MOH 2013 and 2015 Regional Health System (RHS) Regions before they were further analysed.

Results:
P&O patients residing in the central region of Singapore showed the smallest percentage growth (17.8%) among the other RHS from 2012 to 2014. The western region showed the largest increase (61.9%) followed by south (38.9%), east (27.1%) and north (21.9%). In 2014, 30.3% of referrals were from non-TTSH sources, of which 56.9% of them were from SingHealth cluster.

Discussion & Conclusion:
Only TTSH in central RHS provides P&O services. Patients residing in other clusters have shown a larger growth rate over the last 3 years. Cross-RHS referrals would add longer wait time, extra cost and fragmented care for patients. Development and rightsiting of P&O services is urgently needed to ensure patients are timely seen and care remains integrated as part of population-based care.

PP-HSR-4

Use of Potentially Inappropriate Medications among Hospitalised Geriatric Patients in Tan Tock Seng Hospital

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Background & Hypothesis:
Studies have shown a high prevalence of potentially inappropriate medication (PIM) use and a significant association with adverse drug event (ADE) among older persons, however, local data is limited. This study aimed to investigate the prevalence of PIM use, based on the 2012 Beers criteria, and its association with ADE among hospitalised geriatric patients in Tan Tock Seng Hospital.

Methods:
Data from patients discharged from the geriatric medicine department in Tan Tock Seng Hospital from 1 to 31 October 2012 were retrospectively collected. The number of PIMs and ADEs on admission were obtained from the electronic medication records and inpatient discharge summaries respectively. The prevalence of PIM use and its association with ADE were analysed using the Statistical Package for Social Sciences (SPSS) software version 20.

Results:
A total of 248 patient records were reviewed. One or more PIM was prescribed to 102 (41.1%) subjects prior to admission. The top 3 PIMs were famotidine (17.8%), quetiapine (11.6%) and hydroxyzine (19.6%). Thirty-five patients (14.1%) had ADEs on admission. Among the ADEs, 3 (7.3%) were due to PIMs. The most common drug causing ADEs was hydrochlorothiazide (14.6%), a non-PIM. Statistical analysis revealed no significant association between use of PIM and ADE ($P = 0.375$).

Discussion & Conclusion:
PIM use is common among geriatric patients. About 1 in 7 hospitalised elderly experienced ADEs. The majority were however due to non-PIMs. Beers criteria remains a good guide to review drugs where risks outweigh benefits. Clinicians need to be aware of side effects of drugs outside the Beers list.

PP-HSR-5

Is the Doctor the Best Source of Referral?

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Background & Hypothesis:
Traditionally in public healthcare, the doctor performed the gatekeeper role for referrals to specialty services. With advances in education and information, patients are in a better position to direct themselves to medical services. A successful referral also depends on other factors such as patient's motivation, wait time and accessibility to services. This study analyses the different referral outcomes to the National Addictions Management Service from different referral sources.

Methods:
A descriptive analysis of 1 year of referrals from various sources and their clinical outcomes. The clinical outcome was whether the patient presented for the appointment.

Results:
Referrals from restructured hospitals and polyclinics had extremely high default rates (>60%) while referrals received via the patient hotline had good rates (<30%) of patient presenting for their appointment. Emergency room referrals for gambling addiction cases also had extremely high default rates (>70%).

Discussion & Conclusion:
In certain specialties, the doctor may not be the best gatekeeper and contribute to default rates in public services. When referring cases, doctors should assess a patient's motivation and explain the benefits of the service they are referring the patients to.

PP-HSR-6

Exploring Receptiveness towards Group Counselling Sessions with Patients in Outpatient Setting

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Background & Hypothesis:
A plethora of research studies have provided evidence for the effectiveness of group counselling even when compared with other modes of therapy. An added advantage is the utilisation of lesser manpower since groups are usually conducted by 1 or 2 therapists. Given the loss of valuable manpower when patients default and to better allocate the clinic's resources, group sessions may prove to be useful.

Methods:
Patients were asked to complete an anonymous, paper-and-pen questionnaire. Questions included their willingness to continue with treatment if they had to first attend 3 group sessions before individual sessions. They were also asked to provide some reasons should they prefer not to.

Results:
The first-time (n = 40) and repeat-visit patients (n = 72) responded in similar pattern. They both showed lesser preference for group sessions with 73.6% of the first-time and 54.4% of the repeat-visit patients indicating "No". The top 2 endorsed reasons were "Lack of privacy" and "Uncomfortable with group setting".

Discussion & Conclusion:
While similar in responding pattern, it is interesting that the repeat-visit patients seem to be less resistant to the idea of group sessions. Their prior experience with counselling and being at a different phase in treatment could have made them more open to group sessions as they become more insightful and less guarded. Regardless, the implementation of group sessions into treatment should be carefully thought through, with much consideration given on increasing a sense of safety regarding self-disclosure and access of patients into the group.

PP-HSR-7

A Pilot Study to Evaluate Alcohol-based Hand Gels in a Tertiary Hospital

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Background & Hypothesis:
Selection of well accepted hand antiseptic product is one of several factors to improve hand hygiene compliance in healthcare workers. We conducted a study in Tan Tock Seng Hospital, engaging healthcare workers, to evaluate 6 alcohol-based hand gels.

Methods:
We conducted a cross-sectional study in November 2014. Six alcohol-based hand gels were selected based on ethanol concentrations of 60% to 80% v/v, compliance to antimicrobial efficacy European Committee for Standardisation (CEN) standard (EN1500), and the availability of the products during our study period. Participants evaluated all 6 hand gels (labeled A to F) in a single sitting using a self-administered anonymous questionnaire modified from World Health Organization's (WHO) protocol for evaluation of alcohol-based handrub. Hands were washed with soap and water in between the products. Hand wipes were available as an alternative to washing. Chi-square and Wilcoxon signed-rank tests were used for comparison of differences.

Results:
Of 134 participants, 83 were nurses, 37 were allied health professionals (including prosthetist and orthotists, podiatrists, medical social workers, physiotherapists and occupational therapists) and 14 were doctors. Product A (48%) and Product D (15.7%) were the top 2 preferred hand gels ($P <0.01$). Furthermore, Product A was also rated better than Product D in terms of overall rating (median score 4 vs 3, $P <0.01$) and speed of drying (median score 3 vs 2, $P <0.01$).

Discussion & Conclusion:
Product A is the most preferred hand gel. This study enabled us to select products for more extensive testing in the inpatient wards and outpatient clinics.

PP-HSR-8

Patients Presenting with Non-Specific Symptoms: Can They Be Redefined?

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Background & Hypothesis:
Patients diagnosed with non-specific complaints comprise of a large proportion of emergency department (ED) attendances. It is uncertain if the diagnosis is truly non-specific or it can be further redefined. We hypothesised that patients with an ED diagnosis of non-specific signs and symptoms (ICD 798 to 799) can be further recoded and redefined.

Methods:
Retrospective case review of ED patients from 1 January to 31 December 2013 with an International Classification of Disease (ICD) code 9th edition from 798 to 799 was performed. Variables collected include: 1) patient demographics; 2) ICD9 code; and 3) descriptive diagnosis. Cases were reviewed and classified whether they can be: 1) recoded; 2) redefined; or 3) cannot be recoded or redefined.

Results:
A total of 1949 cases were identified. Out of those cases, 303 (16%) died on arrival to ED (ICD9 798); 48 cases (2%) did not have a diagnosis as those patients left without being seen. A total of 1309 cases (67%) could be recoded and 115 cases (6%) could be redefined; 174 cases (9%) cannot be recoded or redefined. For the last group, 56 patients came for needlestick injury assessment, 41 came for medical examinations for medico-legal reasons, and 15 came for assessment after contact or exposure to viral diseases.

Discussion & Conclusion:
A majority of cases with the ICD9 of 798 to 799 can be reclassified. Further research should be undertaken to understand why such high number of misclassification occurs.

PP-HSR-9

Project Dignity – Developing a Palliative Homecare Service for Patients with Advanced Dementia

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Background & Hypothesis:
Singapore bears the unique distinction of having one of the fastest aging populations in the Asia-Pacific region. The prevalence of dementia with an aging population is expected to increase. Advanced dementia is not commonly viewed as a terminal illness, with <10% of referrals for palliative homecare support. The primary objective is to develop a homecare hospice programme with disease specific skills to support advanced dementia patients and their caregivers.

Methods:
Prognostic criteria for entry into the pilot homecare programme was determined after literature review. Patients were enrolled from the inpatient and outpatient units of TTSH. Clinical assessment tools used in the programme were selected based on evidence supporting its use and its practical application in homecare.

Results:
Patients with advanced dementia staged at functional assessment staging of dementia (FAST) 7A, with at least another criteria in the form of either pneumonia, albumin <35 g/L or a feeding tube were eligible for the homecare programme. Patients were assessed using the "Patient Care Bundle", comprising the PAINAD, the NPI-Q and the MNA. Caregivers were assessed using the QUALID and the Zarit Burden Interview, part of the "Caregiver Bundle".

Discussion & Conclusion:
Advanced dementia is still under-recognised as a terminal illness requiring palliative support. Supporting patients and their caregivers in the home with a homecare programme designed to meet their needs is the first step to addressing this gap.

PP-HSR-10

Perspectives of Community Stakeholders on Reasons for High HIV Incidence among Men Who Have Sex with Men (MSM)

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Background & Hypothesis:
HIV infections among men who have sex with men (MSM) has been increasing in Singapore over the last decade, with a high proportion of young MSM infected (59%, aged 20 to 39 years). We solicited views on this increasing trend among MSM to find better avenues for effective HIV prevention interventions for MSM in Singapore.

Methods:
We conducted 6 focus groups discussions (n = 37) with stakeholders with interests in HIV prevention among MSM from the public sector, non-governmental organisations, entertainment establishments, website moderators and community groups. Discussions centred on views about past and current HIV prevention programmes, recommendations for future interventions and reasons for the high HIV incidence. Responses were transcribed verbatim and analysed using qualitative thematic analysis.

Results:
The top reason for high HIV incidence among MSM was fatigue with condom use messages, with safe sex messaging unable to garner the attention of a target audience more concerned with psychosocial issues and sexual identity. Also, younger MSM view HIV as a chronic and treatable disease. These reasons have led to complacency regarding condom use. Participants also reported that younger MSM see unprotected sex as the new norm and some engage in risky sexual behaviour resulting from psychosocial conflict with their sexual identity. Use of and addiction to psychoactive substances was also cited as a contributory factor to be addressed.

Discussion & Conclusion:
Our findings reveal current challenges in preventing HIV in MSM. Given that the need of young MSM centres on sexual identity and psychosocial support, and not HIV, it may be possible to ride safe sex messages during psychosocial interventions.

PP-HSR-11

Receptiveness of a Chronic Disease Self-Management Programme in the Community

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Background & Hypothesis:
Health talks are the most common form of community education and they are accepted widely here. The chronic disease self-management programme is a 6-session workshop that is focused on skills development and self-empowerment for those with chronic conditions or their caregivers. Our survey was conducted to explore how receptive the community was to a chronic disease self-management programme.

Methods:
A feedback survey form which was self-administered was given to all participants at the conclusion of the programme from April 2013 to March 2014. It consisted of 12 open- and closed-ended questions regarding the usefulness of the programme, the techniques, self-management tools used, duration and cost.

Results:
A total of 51 out of 65 participants (78%) responses were collected. Our findings showed that 100% of respondents found the course useful (score $\geq$7/10) and 55% found it extremely useful (score of $\geq$9/10). Twenty-four percent of the respondents described with recurring keywords like "to empower oneself", "self-management strategies", "learning to manage better" and "creating self-awareness", "learning techniques of action plan" and "brainstorm". Eighty-four percent had no difficulty with the techniques of self-management while 16% found the techniques a little difficult, but none found the techniques too difficult. Ninety-six percent found that the techniques helped them to cope with the symptoms of chronic disease.

Discussion & Conclusion:
Self-management is new but our survey showed positive reception in terms of practising self-management concepts and learning these new techniques.

PP-HSR-12

Effect of Psychiatric Specialist Intervention on Antipsychotic Polypharmacy Prescription Patterns

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Background & Hypothesis:
Antipsychotic polypharmacy refers to the prescription of 2 or more antipsychotic medications concurrently to a patient. Antipsychotic polypharmacy has been associated with increased mortality in patients with schizophrenia. There have been many reports of adverse effects of this including increased duration of hospital stay.

Methods:
The study aimed to demonstrate the effect of psychiatric specialist review on antipsychotic polypharmacy prescription patterns.

Results:
During the CPIP, a total of 684 patients have been reviewed over a period of 8 months since November 2014. A total of 271 patients were identified to have 2 or more antipsychotics in their medication regimen; 239 patients were on 2 antipsychotics and 32 patients were on 3 or more antipsychotics. For 23 patients (8%), the number of antipsychotics was reduced to 1 after specialist consultation. There was no reduction in number of antipsychotics for patients on 3 antipsychotics.

Discussion & Conclusion:
Antipsychotic polypharmacy is a complex issue and it is often unaddressed. Regular specialist input may help to reduce psychiatric polypharmacy. More data needs to be collected to determine the result of subsequent consultation and intervention of specialist longitudinally.

PP-HSR-13

When Palliative Care Takes Over. Do We Make a Difference? A Postbereavement Survey of Family Members

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Background & Hypothesis:
The TTSH Palliative Care Team has inpatient beds and a 13-bed palliative care ward. We studied the outcomes of a having a dedicated palliative care primary team in an acute hospital.

Methods:
We surveyed the bereaved family members of 180 patients who had passed on in Tan Tock Seng Hospital from January 2014 to December 2014. Every month, we interviewed 3 groups of family members—5 who had never received palliative care, 5 who received palliative care consultation (blue letter) and 5 who were under the primary care of the palliative care team. Family members were asked to rate the care they received: symptom management, emotional needs and care by the primary team on a 5-point Likert Scale – very poor/poor/fair/good/very good.

Results:
The palliative care primary team saw a greater number of patients with pain, dyspnea and delirium near the end-of-life compared to consult and non-palliative care cases. Families also felt that the palliative care primary team attended to patient's emotional needs (53.3% vs 30%) ($P = 0.01$) and caregivers' emotional needs (75% vs 41.7%) ($P < 0.001$) than non-palliative care teams. A total of 93.3% of families felt the palliative care primary team was helpful compared to 71.7% ($P = 0.01$) in non-palliative care teams and 90% would recommend the team to others facing a similar situation compared to non-palliative care teams (73.3%) ($P = 0.02$).

Discussion & Conclusion:
The presence of a palliative care primary care team in an acute hospital improves patient and family outcomes for patients near the end-of-life.

PP-HSR-14

Prevalence of Major Adverse Cardiovascular Events (MACES) and Bleeds in Postpercutaneous Coronary Intervention Patients Receiving Chronic Dual Antiplatelet Therapy (DAPT)

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Background & Hypothesis:
Although novel P2Y12 inhibitors reduce the incidence of MACEs more effectively than clopidogrel, they may be associated with more bleeding in Asians and are currently much more expensive than clopidogrel in our local setting. We aim to investigate the prevalence of MACE and bleeding in patients receiving novel P2Y12 inhibitors to evaluate the potential of clopidogrel to remain as an affordable option for local patients.

Methods:
Patients who underwent percutaneous coronary intervention (PCI) from August 2013 to June 2014 were analysed. Only those prescribed aspirin and either clopidogrel, prasugrel or ticagrelor were included. Patients were followed over 6 months from the index PCI. Outcomes were adjudicated by 3 doctors blinded to the patients' identities. Univariate and COX survival analyses were used to obtain adjusted hazard ratios.

Results:
A total of 688 subjects were included for analysis (430 clopidogrel, 22 prasugrel, 236 ticagrelor). Prasugrel patients were excluded from analysis due to a small sample size. There were 24 MACEs and 21 bleeds. There were 16 (3.7%) and 8 (3.4%) MACEs among clopidogrel and ticagrelor subjects respectively ($P = 0.80$). Bleeding prevalence was 3.5% (n = 15) among clopidogrel and 2.5% (n = 6) among ticagrelor patients ($P = 0.483$). Clopidogrel use was associated with less severe bleeds ($P = 0.137$). After adjusting for other variables, clopidogrel use was associated with 2.53x increased risk of MACE (CI, 0.591-10.81).

Discussion & Conclusion:
Ticagrelor is associated with fewer MACEs and overall bleeds. However, DAPT with clopidogrel may be safer as it is associated with less severe bleeds.

PP-HSR-15

Advanced Noise-induced Deafness among Workers in Singapore – What Works in Hearing Protection Programmes?

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Background & Hypothesis:
Noise-induced deafness (NID) is the leading occupational disease reported in Singapore, contributing a significant disease burden. This study aims to understand workers' attitudes about advanced NID (NID(A)), the effects of NID(A) on workers, and the effectiveness of NID prevention programmes.

Methods:
Qualitative mixed-method analysis was conducted for 14 workers randomly selected from 71 NID(A) cases (2001 to 2010) sourced from the Ministry of Manpower, Singapore. In-depth interviews were conducted and analysed using qualitative thematic analysis and grounded theory, to obtain a summary distillation of experiences, find associations between themes, and explain the findings.

Results:
Most recognised NID as a significant problem, citing communication difficulties as a key concern. NID(A) affected work productivity in more than half the workers. Provision and usage of personal protective equipment (PPE), and education on NID prevention, were identified as key factors behind the success or failure of hearing protection programmes. Intrapersonal and interpersonal influences were crucial for behavioural change to promote PPE usage. Self-reliance was the strongest theme for NID prevention, where many felt that the inherent desire to comply with hearing protection was the determining factor in preventing NID. General sentiment was that education should focus on easily understandable concepts and methods for NID prevention, and on reinforcing PPE use.

Discussion & Conclusion:
Empowering workers for self-care, and improving education for NID prevention and PPE usage, are essential in hearing conservation programmes. Health behaviour interventions to improve PPE usage should focus at the intrapersonal and interpersonal levels. Future research could assess specific means of improving education modalities or methods.

PP-HSR-16

Prevalence and Reasons for Defaulting Hearing Aid Clinic in a Tertiary Care Centre

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Background & Hypothesis:
Approximately 26.5% of Singaporeans, aged 18 to 69, experience some form of hearing loss. About 30% of newly diagnosed presbyacusis patients do not attend their hearing aid appointment at the Tan Tock Seng Hospital Audiology Department. This study aims to determine the prevalence of defaulters of hearing aid evaluation appointments and to investigate the factors influencing acceptance and compliance with hearing aid amongst the population in Singapore.

Methods:
A single tertiary institution study was conducted. A pool of 876 patients who had been scheduled for a first-time hearing aid evaluation at the Tan Tock Seng Audiology Department during a 12-month period were gathered, of which 214 defaulted. Four patients were excluded, as they did not meet the inclusion criteria. Patients or their main caregivers were telephoned during working hours. A standardised survey was issued to patients. The survey included questions about patient's demographics and defaulting reasons.

Results:
Defaulting rate for first-time hearing aid appointments is 24.4% (n = 214). A total of 51.4% (n = 108) of contacted patients responded to the survey. Most common category of reason was that of personal, followed by economic and lastly social. Most common reason for defaulting is the cost of hearing aids (n = 41; 38%), followed by preconceived ideas of hearing aids (n = 33; 30.6%) and underestimation of handicap (n = 26; 24.1%).

Discussion & Conclusion:
A multidisciplinary approach involving medical and non-medical staff is required to help the defaulters. Our study has helped us understand the population behaviour. Further studies are underway to eventually help implement processes and measures to improve the clinic attendance rate and overall compliance.

PP-HSR-17

Managing Adolescents with Gaming Problems: The Singapore Counsellors' Perspective

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Background & Hypothesis:
Internet use has become an important part of the lives of children and adolescents in modern Singapore, and in this era of online communities and connectivity, problem gaming is emerging as a significant morbidity amongst youths. Correspondingly, cyber wellness services have been established in schools as well as non-government organisations.

Methods:
In this study, we surveyed counsellors who work with youths on their perceptions of youth gaming problems, their expertise and identified needs, and the relationship between gaming problems and maladaptive coping and/or social disenfranchisement.

Results:
The results of this study indicated that most counsellors viewed gaming problems as an outcome as well as a perpetuating cause of social dysfunction and inadequate coping skills, with optimal interventions targeting these 2 aspects.

Discussion & Conclusion:
With gaming problem behaviour an emerging issue among Singapore adolescents that is likely to have associations with poor social functioning and maladaptive coping mechanisms, the survey of counsellors who work with such youths also gives evidence of the growing concern of the morbidities and dysfunctions that can arise from such behaviours. Unsurprisingly, the majority of these counsellors are keen to undergo further training and be equipped with skills in order to assess and identify these youths in need, as well as target the initial trigger point of such behaviours as possible treatment avenues, primarily in the development of mature coping styles and robust social supports as means to combat gaming addictions.

PP-HSR-18

A Study of Nursing Home Admissions to Acute Care Hospital in Singapore

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Background & Hypothesis:
Nursing home residents are generally frail and have multiple chronic illnesses, making them utilise hospital services frequently. Hospitalisations are often necessary but there are cases that are preventable.

Methods:
Four nursing homes (NHs) in Singapore were recruited for this retrospective study. Transfers from January 2013 to December 2014 were reviewed by the clinical representatives from the acute hospital. Cases were rated to be potentially "preventable" using the modified tool from the Interventions to Reduce Acute Care Transfers (INTERACT) II study of Ouslander et al. These transfers were then compared to the non-potentially "preventable" transfers on demographic and clinical variables using univariate and multivariate analyses.

Results:
Out of 709 cases, majority were Chinese, 54% were female and the average age was 77 (range 22-104). Sixty-four percent of the cases required maximum assistance for their basic activities of daily living (BADL) while 88% did not have any advanced care planning (ACP). The common conditions that put the residents at risk for hospitalisation were multiple comorbidity and hospitalisation within the last 6 months. Nine percent of the transfers to acute hospital were "preventable"; 51% of these preventable transfers occurred during office hours. The factors which are significantly associated with "preventable" transfers are without ACP, hospitalisation within the last 6 months and maximum assistance in BADL as adjusted to demographic and clinical variables.

Discussion & Conclusion:
This study sets the stage for implementing measures to reduce unnecessary hospitalisations in the nursing homes.

PP-HSR-19

Predicting Patient Reattendance within 72 Hours in Emergency Department Using Discriminant Analysis via Integer Programming Approach

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Background & Hypothesis:
The proportion of emergency department (ED) patients who returned within 72 hours is an indicator of quality of care. The objective of this study was to develop a decision support tool capable of identifying discriminatory factors to predict patients who will return to ED within 72 hours.

Methods:
We collected ED attendances in a local hospital from 2011 to 2013 and tagged those who returned to ED within 3 days as reattendances. We featured more than 100 variables including diagnosis and patient acuity, chief complaints, selected laboratory tests, and also coded whether the patients ever had social issues. We conducted univariate analysis to derive a relatively small subset of factors. From which, we used discriminant analysis via mixed integer programming (DAMIP) incorporating feature selection to predict patient reattendance within 72 hours.

Results:
We examined a total of 328,733 visits where 4.6% revisited ED within 3 days. We randomly selected one-third of the data as training data and the rest as testing. Among 47 factors derived using univariate analysis, we selected 12 key factors for DAMIP prediction. These include chief complaint respiratory, COPD and allied health, handover, average temperature, diastolic BP range. Prediction results were of about 40% sensitivity and 74% specificity in both training and testing sets.

Discussion & Conclusion:
This proposed framework may help ED physicians predict patient reattendance to ED within 72 hours using patient specific values of selected discriminatory factors. It might help to improve care and offer additional care or guidance to reduce ED readmission.

PP-HSR-20

Integrated Hip Fracture Care Pathway Programme – Year 2 Evaluation Results

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Background & Hypothesis:
This project aims to evaluate the effectiveness of the Integrated Hip Fracture Care Pathway (IHFCP) in improving outcomes of hip fracture patients 60 years and older through a seamless, coordinated plan of management.

Methods:
The IHFCP involves a protocolised pathway for the care of patients with neck of femur, intertrochanteric or subtrochanteric fracture. It uses evidence-based guidelines and starts on arrival at the emergency department, continuing through admission to acute hospital, inpatient and day rehabilitation, community hospital and the home. This multidisciplinary programme involves orthopaedic, rehabilitation and geriatric specialists, nurses, physiotherapists and other allied health professionals. At each level of care, process and outcome indicators are used to facilitate monitoring at the patient level and evaluation at the programme level.

Results:
At the second year of implementation, 582 patients were enrolled; mean age was 82 years, 30% were male. Most (82%) were managed surgically with 57% of those fit for surgery operated within 48 hours of admission. Postoperative therapy was started on day 1 for 93% while 73% were transferred to inpatient rehabilitation on the sixth day. Average length of stay at acute care was 11.7 days. Thirty-day readmission rate was 1.5% while 1-year mortality was 13.4%. At 6-months postdischarge, 57% had a Modified Barthel Index score of 20, while at least 64% had improved quality of life at 6 months.

Discussion & Conclusion:
Promising results from the second year of implementation may be used as the basis for further improvement in outcomes.

PP-HSR-21

Characteristics of Patients with Chronic Obstructive Pulmonary Disease Admitted to a Tertiary Referral Hospital

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Background & Hypothesis:
Chronic obstructive pulmonary disease (COPD) is a common cause for admissions to hospital in Singapore. COPD exacerbations leads to utilisation of healthcare services. The objective is to delineate the characteristics of patients who have been admitted to a tertiary referral hospital for COPD.

Methods:
This is a retrospective cross-sectional study. Patients with COPD were recruited between February 2012 and November 2013. Data on age, gender, ethnicity, presence of comorbidities, COPD Assessment Test (CAT) score, presence of long term oxygen therapy, inhaler compliance, FEV1 and FEV1/FVC were collected.

Results:
A total of 203 patients were recruited for the study. They had a mean age of 73.1 ± 9.9; 91.6% of them were male and 57.6% were of Chinese ethnicity. A total of 22.7% of them had frequent hospital admissions while 70% had significant comorbidities, 3.94% had long-term oxygen therapy. Inhaler compliance data was available for 62 of the patients and 16.1% were not compliant. CAT score data was available for 62 patients and 71% scored 10 or more. mMRC scale was available for 40 patients and 57.5% scored 3 or more. The severity of COPD was available for 165 patients with spirometric data: 24.2% mild, 44.2% moderate, 31.5% was severe or very severe.

Discussion & Conclusion:
Patients who are admitted for COPD in a tertiary referral hospital are older and more likely to be of Chinese ethnicity. They also have the presence of significant comorbidities. They have moderately severe COPD. These findings allow us to understand the characteristics of the inpatient COPD population and helps us tailor services to address their needs, such as telemedicine.

PP-HSR-22

Dementia Care in Primary Care – Effectiveness in Comparison to Specialist Care

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Background & Hypothesis:
Dementia care in Singapore is predominantly provided in tertiary care. In 2012, a Primary Care Dementia Clinic (PCDC) was set up in Ang Mo Kio Polyclinic to treat and manage stable dementia patients in primary care. This study assessed if dementia patients followed up at PCDC will receive similar quality of care as those followed up at the Memory Clinic (MC) in TTSH.

Methods:
This is a quasi-experimental study where dementia patient-caregiver dyads who followed up at PCDC or MC were recruited. Quality of life (Quality of Life-Alzheimer's Disease, QOL-AD), adverse events (falls, hospital admissions and emergency department (ED) attendances), and caregiver satisfaction (5 domains – results communicated appropriately; appropriateness of diagnostic information; attitude of clinicians; information and advice to relatives; and usefulness of assessment), were measured at 1-year follow-up. Ordinary least square and zero-inflated poisson regressions were performed to risk-adjust QOL-AD scores and number of falls, hospital admissions, and ED attendances respectively.

Results:
A total of 108 patient-caregiver dyads (PCDC – 45; MC – 63) completed the 1-year follow-up. Both groups were comparable in QOL-AD scores, and caregiver satisfaction at 1-year. PCDC patients have higher number of falls (IRR: 2.36; 95% CI, 1.26-4.41; P = 0.01), but fewer hospital admissions (IRR: 0.34; 95% CI, 0.14- 0.81; P = 0.02) and ED visits (IRR: 0.35; 95% CI, 0.14-0.90; P = 0.03) than MC patients at 1-year.

Discussion & Conclusion:
PCDC provided similar quality of care as compared to specialist care, but also reduced healthcare utilisation among stable dementia patients. This supports the importance of management of dementia in primary care, as quick access would allow for prompt treatment.

PP-HSR-23

Utilisation of Spirometry in the Management of COPD

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Background & Hypothesis:
Chronic obstructive pulmonary disease (COPD) is a chronic debilitating respiratory disease characterised by irreversible airflow limitation, and progressively worsening lung function. The diagnosis is confirmed on spirometry showing a postbronchodilator FEV1/FVC <0.7. Patients are often admitted with exacerbation. In patients with no previous diagnosis of COPD, the diagnosis is suggested from symptoms (breathlessness, cough, sputum), a background of smoking, and the patient treated. Spirometry is usually not performed during an exacerbation; it is recommended to be performed at the follow-up visit 4 to 8 weeks after discharge, when the patient is stable.

Methods:
We reviewed the records of 530 patients admitted to Tan Tock Seng Hospital in 2014 for management of COPD.

Results:
A total of 343 (64.7%) patients were known to have COPD from previous spirometry. Of the 128 (24.1%) patients with no previous COPD, 80 patients were to be followed up at the respiratory medicine clinic with spirometry. This was performed in only 32 patients, confirming COPD in 24 (75%). Twenty-one patients did not undergo spirometry but continued to be managed as COPD without confirmation, or consideration of alternative diagnoses. There were 24 patients who were lost to follow-up.

Discussion & Conclusion:
Despite improved accessibility to spirometry in the hospital, and recognition that COPD is a major chronic respiratory disease, not all patients suspected of the disease undergo spirometric confirmation as recommended by management guidelines. Patients who may be having alternative diagnoses may be inappropriately treated as COPD with medications which may not be of benefit, and not receiving the right advice.

PP-HSR-24

Evaluation of a Chronic Obstructive Pulmonary Disease Telehealth Programme to Reduce Healthcare Utilisation in a Singapore Tertiary Healthcare Institute

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Background & Hypothesis:
Chronic obstructive pulmonary lung disease is a leading cause of recurrent hospitalisations. The study aims to evaluate if a telephone-based telehealth programme can reduce health care utilisation and time to first hospital readmission in the 6 months postdischarge in COPD patients.

Methods:
This is a non-randomised control study. Patients were recruited between November 2012 to 2013 and enrolled into intervention and control group by personal choice. The intervention involved 4 telephone calls made within 6 months by a telecarer. Patients were educated on COPD, smoking cessation, nutrition and had a review of CAT score. Rates of hospital admissions, emergency department visits, specialist and polyclinic visits were extracted from patient's electronic medical records. Descriptive analysis and Mann-Whitney U tests were performed. Kaplan-Meier survival analysis was used to determine time to first event.

Results:
A total of 261 patients were recruited (intervention: 138; control: 65; excluded: 58). The mean age was 73.1 ± 9.9. The mean total healthcare resource utilisation (COPD-related hospital admission, A&E, SOC and polyclinic visits) was 1.1 ± 1.9 in the intervention group and 0.5 ± 1.0 in the control group ($P = 0.7$). Telehealth did not extend mean time (days) to first event (intervention: 133.1 days (95% CI, 122.4-143.8)). Control: 143 days (95% CI, 128.5-157.6) ($P = 0.3$).

Discussion & Conclusion:
The study is the first report of a telehealth COPD programme in Southeast Asia. A single intervention of telephone education and support did not reduce short-term healthcare utilisation or extend time to first event. Longer observation period and inclusion of other interventions such as medication adjustments in the programme may be considered.

PP-HSR-25

Type of Hypertension Treatment Regimen and its Effect on All-Cause Mortality in Singapore

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Background & Hypothesis:
Our study aims to assess the impact on type of treatment regimen (monotherapy vs combination therapy) on all-cause mortality of hypertensive patients in Singapore.

Methods:
This is a retrospective cohort study of newly diagnosed hypertensive patients in 2007. Patients were followed up until death or their last visit at the polyclinic and the event of interest was all-cause mortality. Types of treatment regimen that was assessed were as follows: 1) monotherapy throughout the follow-up period; 2) monotherapy at baseline subsequently switching to combination therapy; 3) combination therapy throughout the follow-up period; 4) combination therapy at baseline subsequently switching to monotherapy; and 5) other treatment regimens (these patients switched between monotherapy and combination therapy throughout the study period). Cox regression analysis was done to calculate the Hazard Ratio (HR) for the 5 treatment regimens.

Results:
There were 2975 newly diagnosed hypertension patients in 2007. Median survival time was 5.1 years. After adjusting for age, gender, dyslipidaemia, obesity, stroke and acute myocardial infarction, patients receiving regimens 2 to 4 had an increased risk of death compared to regimen 1, but these HRs were not statistically significant. Patients who switched between monotherapy and combination therapy throughout the follow-up period (regimen 5) had a statistically significant reduced risk of death compared to those on monotherapy throughout (regimen 1) (adjusted HR 0.45; 95% CI, 0.30-0.66).

Discussion & Conclusion:
This study shows that type of treatment regimen does impact survival of hypertensive patients. Further analysis on the specific drug combinations and their impact on survival is needed.

PP-HSR-26

Chronic Pain and its Association with Health Behaviours in a Singapore Rental Flat Population – A Cross-Sectional Study

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Background & Hypothesis:
This study aimed to determine the prevalence of chronic pain in residents of a low socioeconomic public rental flat community in Singapore, and its association with health behaviours.

Methods:
Chronic pain was defined as pain = 3 months. From 2009 to 2014, residents in 5 public rental flat enclaves were asked if they had chronic pain; sociodemographic factors and participation in health screening were also measured. Subsequently, to determine if functional status, mood, and social isolation were associated with chronic pain in the elderly, we further studied elderly (aged = 60) in 2 public rental flat enclaves in 2012. We compared against residents from an adjacent owner-occupied public housing.

Results:
Prevalence of chronic pain in rental flat population was 14.2% (133/936); compared with 14.4% (158/1101) in the owner-occupied population ($P = 0.949$). The most common site was knee/ankle pain (29.3%, 39/133). Amongst rental flat residents, unemployment was associated with chronic pain (aOR = 1.56, CI, 1.03-2.38, $P = 0.023$); amongst the elderly, instrumental activities of daily living dependency was associated with chronic pain (aOR = 2.38, CI, 1.11-5.00, $P = 0.025$), female gender, being single, and higher education (all $P > 0.05$). Amongst rental flat population, chronic pain was associated with higher participation in diabetes (aOR = 2.11, CI, 1.36-3.27, $P < 0.001$), dyslipidaemia (aOR = 2.06, CI, 1.25-3.39, $P = 0.005$), colorectal cancer (aOR = 2.28, CI, 1.18-4.40, $P = 0.014$), cervical cancer (aOR = 2.65, CI, 1.34-5.23, $P = 0.005$) and breast cancer (aOR = 3.52, CI, 1.94-6.41, $P < 0.001$) screening; this association was not present in the owner-occupied population.

Discussion & Conclusion:
Amongst residents of a low socioeconomic public rental flat community, chronic pain was associated with unemployment and functional limitation in the elderly. While there was no significant difference in chronic pain prevalence between the rental flat population and adjacent owner-occupied precincts, amongst rental flat residents, chronic pain was associated with higher screening participation across numerous disease modalities.

PP-HSR-27

Conversations Before the Crises, Planting Advance Care Planning. Pilot Projects in a Tertiary Hospital in Singapore

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Background & Hypothesis:
The need for raising awareness of advance care planning (ACP) among public and healthcare professionals is imperative. Lack of practice of ACP is associated with the inappropriate use of aggressive interventions on the terminally ill, resulting in higher burden during decision-making amongst family, thus increasing anxiety and postbereavement stress.

Methods:
The team applied a 4-pronged strategy taught by Respecting Choices (Wisconsin, USA), that is: a) engage community and stakeholders; b) train healthcare professionals; c) establish and enhance systems in ACP; and d) audit and track outcomes.

Results:
From 2012 to 2014, 3365 members of the public and healthcare professionals were reached through awareness talks. As of March 2015, we have trained 263 facilitators. There are 15 pilot groups, 12 clinical champions and 40 ACP mentors. A total of 447 completed Preferred Plan of Care (PPC), an ACP targeting patients with more advanced illness. From 2013 to 2014, an increase of 11% of total PPC was done. Patients with ACP who died in TTSH, had their preferences honoured regarding CPR and extent of medical intervention at 98% and 97% respectively. As of December 2014, postfacilitation satisfaction survey showed more than 95% of patients and families strongly agreed or agreed on positive outcomes.

Discussion & Conclusion:
ACP is a valuable attempt in building a patient-centred culture in the healthcare system by engaging senior management, clinical champions and clinicians to spread awareness and win support of fellow healthcare professionals. Continuing efforts are seen at audit and research; and bring ACP upstream by holding conversation with more well patients.

PP-HSR-28

Usage of Healthcare in Singapore for Patients with Malignant Pleural Effusion

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Background & Hypothesis:
With the aging population in Singapore, palliative care is starting to gain more attention. This study is to find out the usage of healthcare by patients with advanced pleural malignancy so that we can better address their palliative care needs.

Methods:
This is a retrospective study of 186 cases of malignant pleural effusion taken from NUH. Patients recruited had pleural fluid drainage and any subsequent data was collected till March 2015. Cases that ranged from having fluid drainage were dated from June 2009 to June 2014. Collected data was then grouped under periods of 3 months.

Results:
Within 6 months, 110 patients were readmitted; 34.5% were due to symptomatic progression of carcinoma and referred to the palliative team, 12.7% were due to infection and 5% were for palliative chemotherapy. A total of 33.6% of the patients required repeated pleural drainage and 10% needed treatment for comorbidities, which are services provided by tertiary hospitals. Patients were hospitalised for an average of 13 days and median of 8 days with interquartile range of 5.25 to 19. In 68 deaths due to progression of carcinoma, 70.5% died within 6 months from diagnosis of cancer.

Discussion & Conclusion:
The high average of hospitalisation days shows that these patients still seek palliative help from acute tertiary hospitals. Given the high mortality within a short span of 6 months and that more than half of the hospitalised patients could have avoided readmission with good palliative care, it is therefore necessary for better home palliative services to be made available and accessible for them.

PP-HSR-29

Projection of Diabetes Burden in Singapore Using a Dynamic Markov Model

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Background & Hypothesis:
This study aims to forecast the prevalence and volume of adult Singapore resident population with prediabetes and diabetes between 2010 and 2035.

Methods:
A dynamic Markov model with 9 mutually exclusive states was developed based on the clinical course of diabetes with time-dependent rates and probabilities over 25 years. With publicly available data and a chronic disease register, the model forecasts annual disease volumes by simulating transition of individuals across different health states using prevalence rates, incidence rates, mortality rates, ageing index, disease detection and complication rates.

Results:
In 2035, the volume of Singapore residents with prediabetes and diabetes is projected to be more than double that of 2010, from 434,685 to 903,596 and 373,104 to 823,802 respectively. The prevalence estimates of prediabetes and diabetes will rise steadily from 15.5% to 24.9% and 13.3% to 22.7% respectively. By 2035, a further estimate of 757,475 and 117,257 patients with prediabetes and diabetes (without complications) respectively will remain undiagnosed, and thus untreated. The prevalence of complications (both detected and undetected) is forecasted to rise from 60% in 2010 to 70.2% by 2035. A simultaneous annual 1% reduction in both pre-DM and DM incidence rates during the next 2 decades is likely to avert 257 diabetes cases per year, leading to healthcare cost saving of $0.52 million per annum.

Discussion & Conclusion:
There is a pressing need to increase early detection of prediabetes and diabetes, and adopt more aggressive interventions to retard disease progression.

PP-HSR-30

No-Show in Specialist Outpatient Clinics (SOCS)

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Background & Hypothesis:
No-shows contribute to wastage given the limited clinical resources. It also affects the accessibility of other patients to the care they really need. To reduce the no-show rate, various modes of reminders have been applied to remind patients to attend their appointments.

Methods:
No-show is a complicated problem resulting from many causes including patient's behaviour. The study aimed to understand no-show behaviour from historical data and identify characteristics of the segment with the highest no-show rate. Cross-Industry Standard Process for Data Mining (CRISP-DM) methodology was applied to discover insights from data. The decision tree and logistic regression models were built in SPSS Modeler to classify patients.

Results:
Results of the analysis support the hypotheses that reminders to patients of their appointments were important in reducing no-shows. For those with reminders, SMS reminders were found to be more effective as compared to letter reminders. Subsidised patients were likely to be no-show than non-subsidised patients, especially for the non-reminder group. First-visit patients who did not receive reminders contributed significantly to no-shows. For repeat-visit patients, the segment with the highest no-show rate was non-Chinese subsidised patients aged 52 years and below.

Discussion & Conclusion:
Further studies to understand their sociology will be helpful. To reduce the no-show rate, sending reminders should continue with a focus on SMS, targeted at special groups of patients with a high probability of no-show.

PP-HSR-31

Prediction Model for Specialist Outpatient Clinic (SOC) Appointment Outcome

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Background & Hypothesis:
Patients with SOC appointments may not show up on the appointment date. Many research papers have demonstrated that no-shows lead to wastage of clinical resources and a reduction of appointment slots available to other patients. Predicting appointment outcomes and the likelihood of no-show behaviour can help mitigate the impact brought about by no-show behaviour among patients. It can also be used to target certain interventions on patients with a high no-show probability for reminder actions.

Methods:
Data mining technique, C4.5 algorithm in particular, was used to develop a decision tree model by using Microsoft Excel's Visual Basic Application. This model was constructed with the aim to help understand the key attributes of no-show behaviour in a particular SOC from historical data.

Results:
Rules were discovered and transferred into a prediction table in Microsoft Excel to predict appointment outcomes for new cases. By inputting patient's attributes and factors of new cases, the prediction model will present the predicted outcome for a patient's appointment based on the rules with confidence levels. Attributes and factors considered in the model construction included patients' age, type of case, whether there was a reminder, mode of reminder, etc. The average accuracy of the constructed prediction model was 87.5%.

Discussion & Conclusion:
To reduce no-shows by focusing on groups of patients with a high probability of no-shows.

PP-HSR-32

Overbooking of Appointment at Specialist Outpatients Clinics (SOCS)

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Background & Hypothesis:
Overbooking is one of the operational strategies for resource management in healthcare. Overbooking on the one hand facilitates access to urgent care but on the other hand can result in congested SOCs. This study tested overbooking strategies in different SOC settings to answer 2 critical questions, "Where to slot in those overbooking appointments?" and "How much to overbook?".

Methods:
The discrete event simulation (DES) model was built in MedModel to simulate "as-is" situation and conduct "what-if" analysis. Effects of "morning overbooking strategy" and "modified wave overbooking strategy" on consultation waiting time were compared in 2 commonly used SOC settings, namely "single specialty in single clinic" and "multiple specialties in single clinic".

Results:
"Morning overbooking strategy" shifted all overbooking slots in the afternoon to the morning. The simulation results show that patients' consultation waiting time is relatively longer compared to the "as-is" scenario. "Modified wave overbooking strategy" scheduled overbooking slots in a wave-like pattern in line with patient's arrival variations. The simulation results show that "modified wave overbooking strategy" significantly reduces the consultation waiting time for all specialties in both SOC settings. Reduction ranged from 19% to 69% for the 95th percentile consultation waiting time.

Discussion & Conclusion:
This study suggests that "modified wave overbooking strategy" is a preferable operational strategy to implement in the SOC appointment booking system.

PP-NR-01

Effectiveness of Nurse-Led Ordering for High-Risk CRE Screenings

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Background & Hypothesis:
Carbapenem-resistant *Enterobacteriaceae* (CRE) infections are associated with high mortality rates and have become an important threat to public health, hence CRE screenings for high-risk patients have been initiated to identify and control potential transmission in the healthcare settings. Studies show that nurse-led interventions improve outcomes in patient's safety. The objective of this study is to evaluate the effectiveness of nurse-led ordering for high-risk CRE screenings.

Methods:
Rectal swabs or stool cultures were obtained for CRE screening for patients who have previously admitted to any local/overseas hospitals in the past 12 months, excluding Tan Tock Seng Hospital (TTSH). We started with doctor-led ordering for 9 months from July 2013 to March 2014 and switched to nurse-led ordering from April 2014. We introduced nurse-led ordering together with doctor's order of CRE screening using an electronic system.

Results:
During the study period (July 2013 to March 2015), a total of 1614 CRE screenings were performed. Out of 118 screenings ordered by doctors in the first 11 months, 1 tested positive. After the implementation of nurse-led ordering, there were 1414 screenings out of which 19 were positive. This showed that nurse-led screening resulted in a higher number of patients being screened as well as higher positive rate among those who were screened.

Discussion & Conclusion:
Empowering nurses to initiate and order CRE screenings with clearly defined criteria resulted in higher compliance compared to relying on doctors' ordering. This more effectively identifies positive CRE patients, enabling early interventions for infection control and minimising potential transmission in TTSH.

PP-NR-02

Remodelling of Care: The Future of Healthcare

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Background & Hypothesis:
Poor patient outcome, increasing workload and increasing job dissatisfaction has been linked to nurse staffing level which is also affected by the burden of an aging population. It is hypothesised that a narrowed principle nurse (PN) to patient ratio will allow optimisation of staff capabilities and increase patient safety.

Methods:
A general ward setting was selected in a tertiary hospital to pilot a new care delivery model. A briefing session attended by nurses highlighted the new processes. This was started in mid-2013 and is still ongoing. Data was gathered through Trendcare, patient/staff satisfaction survey and NDNQI. As a comparator, staff satisfaction data was gathered from a neighbouring ward. Descriptive statistics were analysed by Excel.

Results:
Staff satisfaction on appropriate patient assignment and staffing levels was 15% and 14% higher than the comparator, respectively. Overall patient satisfaction increased by 15% between year 2014 to year 2012. Increased safety was reflected in a drop on level 3 fall rate between year 2014 to year 2012 by 66%.

Discussion & Conclusion:
Optimisation process led to a narrowed ratio of 7 patients to 1 nurse by 2014. The conclusion is that the narrowed PN to patient ratio demonstrates that it has contributed to increased staff and patient satisfaction and has improved patient safety. This clearly shows that nursing processes can be readily changed to meet the future challenges of healthcare.

PP-NR-03

Experiences of Patients Undergoing Haemodialysis in Singapore: An Exploratory Qualitative Study

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Background & Hypothesis:
Haemodialysis, the universal chosen treatment modality of end-stage renal failure, constitutes multiple notable lifestyle changes that are likely to compromise quality of life. Among which, restrictions on the dietary and fluid aspect was found to be the most challenged aspect of self-management. Regardless, predictors of non-adherence were limited, particularly in Asian cultures. Therefore, this study aimed to explore the perceptions of patients undergoing haemodialysis in Singapore, with regards to the imposed dietary and fluid restriction regime.

Methods:
An exploratory qualitative approach was adopted. A convenience sample of 14 patients undergoing their haemodialysis was recruited from a renal unit of a tertiary hospital in Singapore. Data were collected through face-to-face individual interviews, and a semi-structured interview guideline was used.

Results:
Thematic analysis was carried out under the close supervision of experienced researchers. Themes that emerged from the qualitative data were as follows: 1) pessimism; 2) existing struggles; 3) experimenting the limitations; and (4) perceived quality of support. This study suggests that the imposed dietary and fluid restriction prevails as an enduring stoicism that many haemodialysis patients in Singapore are experiencing. This study also highlights the significance of perceived quality of support in optimising health outcomes.

Discussion & Conclusion:
Adherence behaviour, typically unpredictable, is easily influenced by various intrinsic and extrinsic factors. While this study has revealed that most patients exhibit high reliance on healthcare professionals, it is vital that healthcare professionals deliver adequate patient care and support. Subsequent periodic review of existing educational strategies, policies and nursing care should also be conducted to enhance health outcomes.

PP-NR-04

Early Screening of CMV Retinitis and Patient Education Provided by HIV Outpatient Nurses Reduces Disease Severity

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Background & Hypothesis:
Cytomegalovirus (CMV) retinitis is a common cause of HIV/AIDS-associated blindness (Tun et al, 2011). The fundamentals of CMV retinitis management are early diagnosis, specific anti-CMV treatment and antiretroviral therapy (Heiden et al, 2014). Trained outpatient nurses have been screening HIV patients since 2011. This has allowed early detection of the disease and treatment initiation. Intravitreal injection of gancyclovir is often used for treatment of severe CMV retinitis (Stewart, 2010).

Methods:
Newly diagnosed HIV patients with CD4 counts <100 cells/mm^3 are identified by the nurse and screened further via phone call for ocular symptoms of CMV retinitis, e.g. blurred vision and floaters. Appointment with the patient's consent is made to an ophthalmologist if ocular symptoms are present. Patient education on eye examination and treatment of infection is provided by the nurse on review. CMV retinitis photography may be done by technicians to confirm diagnosis. Patient with uveitis would be treated by the ophthalmologist. If nil uveitis, patients are to monitor their CD4 counts and attend regular eye checks to detect early symptoms.

Results:
Between January 2012 and May 2015, 448 patients were referred by the outpatient nurse to the ophthalmologists. Patient's education was given. It resulted in 95% of patients receiving early management. Only 5% required treatment with intravitreal injection of ganciclovir. There has been no new cases requiring intravitrieal gancyclovir injection in 2015 to date. The number of cases for intravitreal gancyclovir injections has declined from 12 in 2012 to 7 in 2013 to 4 in 2014.

Discussion & Conclusion:
This paper documents the feasibility of nurse screening for CMV retinitis. This resulted in early detection and avoidance of intravitreal gacyclovir injection. Patient education is crucial to increase awareness of early symptoms.

PP-NR-05

GeriCARE (Geriatric Comprehensive Assessment and Rehabilitation of the Hospitalised Elderly) Service: A Collaborative Project between Geriatric Medicine and General Medicine

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Background & Hypothesis:
With increasing geriatric patients and pressure for acute beds, it is inefficient to manage patients with subacute care needs within the acute setting. A collaborative GM-GRM inpatient care model was established from January 2012 to June 2014 to improve efficiency by rightsiting patients and extending subacute service to the department of GM. The GeriCARE team is formed to provide the assessment and triage service.

Methods:
GM refers suitable patients to GeriCARE team who will assess patients, suggest interventions for optimisation, develop transition care and discharge plan, and triage patient to the rightsite of care. In additional, GeriCARE will help to identify geriatric syndromes and make appropriate recommendations for alternative discharge plans.

Results:
A total of 3200 patients were seen and referrals to GeriCARE were mainly for GEMS transfer. However, only 1514 (47.3%) patients require GEMS transfer. For those 771 patients that were discharged directly back to the community from the acute inpatient (24.1%), they were linked with community resources, or given new GRM appointments. There were 196 patients who were also identified for continuation of delirium or behaviour management in either ACE (Acute Care of Elderly) unit or GMU (Geriatric Monitoring Unit).

Discussion & Conclusion:
GeriCARE is a mobile geriatric assessment team which aids the primary team to develop appropriate care plan that matches to the patient's needs to discharge to the community. The administrative data is insufficient to demonstrate reduction in LOS, readmissions, or improvement in satisfaction. Future study may consider to evaluate the clinical effectiveness of GeriCARE and comprehensive geriatric assessment service.

PP-NR-06

A Systematic Literature Review to Ascertain the Effectiveness of Using Bed Exit Alarm in the Prevention of Bed Falls in a Psychogeriatric Ward

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Background & Hypothesis:
Bed exit alarms detect motion and send alarm signals to alert caregivers when a patient is attempting to exit a bed. Its use renders an opportunity for timely staff response to a fall risk situation associated with unplanned/unassisted bed exits. The utility of these devices is often appraised around the concepts of preventing patient falls and related injuries. To acquire further knowledge, a systematic review of literature was carried out to generate practice-based evidence in relation to the use of bed exit alarms/monitors. This study was conducted: 1) to examine evidence-based articles regarding the use of bed exit alarms in psychogeriatric settings; and 2) to obtain and apply newly acquired knowledge towards assessing the effectiveness of such devices in reducing bed fall incidents and injuries among elderly inpatients in a psychiatric hospital in Singapore.

Methods:
A systematic review of literature was the main method used to generate evidence-based results.

Results:
Due to the lack of random clinical studies, all 5 studies (conducted in the USA) find evidence offered on the effectiveness of bed exit alarms to be inconclusive. Its overall reliability in detecting movements out of bed has not been established. The use of bed exit alarms is useful but it should not compromise staff vigilance in any way.

Discussion & Conclusion:
These findings indicate the there was little evidence to show that bed exit alarms have the capacity to prevent falls totally. Decisions to use bed exit alarms as an assistive tool for falls prevention remain open to the full discretion of any hospital management.

PP-NR-07

Hip Care Clinic: Improving Osteoporosis Treatment after a Hip Fracture in Tan Tock Seng Hospital, Singapore

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Background & Hypothesis:
Hip fractures are a common and serious consequence of osteoporosis. However, the identification and treatment of osteoporosis in these high-risk patients for subsequent fractures are widely reported to be inadequate. In 2012, only 19% (105/556) of elderly hip fracture patients admitted under Orthogeriatric Service in Tan Tock Seng Hospital were screened for osteoporosis. A multidisciplinary Hip Care Clinic was implemented in January 2013 to improve the diagnosis and treatment of osteoporosis for elderly hip fracture patients.

Methods:
A prospective cohort study of patients aged >60 years with fragility hip fractures (1 January 2013 to 31 December 2013) were recruited to the clinic 4 weeks after discharge from hospital. Patients had bone mineral density (BMD) evaluation to detect osteoporosis and were treated accordingly based on a treatment algorithm for osteoporosis. Patients with severe renal impairment (creatinine clearance <20 mL/min) were excluded.

Results:
A total of 582 patients were included in the study and 399 BMD evaluations were done. The average age was 81 years, of whom 71% (413) were women and 29% (169) were men. Out of those patients, 259 (65%) were deemed suitable to start osteoporosis treatment while 140 (35%) were not. Out of 259 eligible patients, 210 (81%) were started on osteoporosis treatment while 49 (19%) were not. Sixty-seven percent (142) were started on alendronate, 15% (31) risedronate, 15% (31) stronium ranelate, 2% (4) denosumab and 1% (2) zoledronic acid. Alendronate is the firstline therapy for the prevention of subsequent fractures in our tertiary hospital.

Discussion & Conclusion:
Implementation of a multidisciplinary Hip Care Clinic significantly increases detection of osteoporosis through BMD evaluation for hip fracture patients. Appropriate osteoporosis treatment in this group of patients could reduce another secondary fragility fractures.

PP-NR-08

Level of Awareness and Attitudes of Students towards Mental Illness

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Background & Hypothesis:
Stigmatisation of people with mental illnesses is common in society and it affects their status. This study assessed the level of knowledge, attitudes and awareness towards mental illnesses among NTU undergraduates. It is important to understand students' opinion and future planning.

Methods:
Self-report questionnaires were used to gather demographic information, knowledge, awareness, attitudes and social distance information towards mental illnesses. Email to all students at NTU and only 106 subjects (19.1%) had responded. Inclusion criteria included full time male or female NTU undergraduates, students who had access to emails and who had consented to participate. Data was analysed using Statistical Analysis System (SAS) version 9.2 (SAS Institute, Cary, North Carolina).

Results:
Those who were aged 21 and above significantly show higher score of knowledge compared to those aged 20 and below ($P = 0.03$). Undergraduates who were less than 21 years old were significantly less likely to select "I know it very well" on the knowledge of common mental disorders ($P = 0.01$) compared to those aged 21 and above. Undergraduates who were in year 2 ($P = 0.04$), year 3 ($P <0.001$) and year 4 ($P = 0.02$) were significantly more likely to choose "I know it very well" on similar knowledge compared to year 1 undergraduates.

Discussion & Conclusion:
Undergraduates were generally tolerant and accepting towards mental health issues. They have insufficient knowledge in areas like causes and treatment of mental disorders. The response rate of this study was poor which may be attributed to stigma. There is a strong need for education and inculcation of tolerant attitudes.

PP-PCR-01

Polypharmacy among Residents in a Nursing Home in Singapore

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Background & Hypothesis:
Polypharmacy (defined as concurrent use of ≥5 medications) in nursing home residents is a concern as the risk for adverse events rises with the number of medications taken. Monitoring polypharmacy in this population can improve the quality of nursing home care. This study aimed to determine the prevalence of polypharmacy and leading therapeutic subclasses included in the polypharmacy of Renci Nursing Home (RNH) residents.

Methods:
This was a cross-sectional study of all RNH residents (n = 276). We collected data from their inpatient medication records from 26 August to 3 September 2014. Non-medicated soaps and moisturisers were excluded.

Results:
Out of those residents, 60.9% were Chinese, 33.3% Malay, 5.1% Indian and 0.7% others. Mean age was 71.7 years; 191 (69.2%) were elderly (≥65 years old). Most residents were male (60.0%). A total of 81.2% (224) and 29.3% (81) of all residents had at least 5 and 10 medications, respectively. The prevalence of polypharmacy (≥5 medications) was 79.1% and 85.9% among the elderly and non-elderly respectively (P = 0.181), while 27.2% and 34.1% of elderly and non-elderly residents, respectively, were taking at least 10 medications (P = 0.246). The most frequent medications for residents who received at least 5 medications included laxatives (91.5%), agents for acid or peptic disorders (56.3%), pain or pyrexia relievers (53.6%), antihypertensives (50.0%) and antilipidemics (45.1%).

Discussion & Conclusion:
Polypharmacy is common among RNH residents. Although complex medication regimens are often necessary for nursing home residents, monitoring polypharmacy and its consequences may improve the quality of nursing home care and reduce unnecessary adverse event-related healthcare spending.

PP-PCR-02

Proximity to Primary Care and Association with Health Screening and Chronic Disease Management in Rental Flat Populations in Singapore – A Cross-Sectional Study

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Background & Hypothesis:
We investigated whether proximity to different types of subsidised primary care—general practitioner (GP) clinics and polyclinics—is associated with health behaviours in residents of public rental flat communities and of low socioeconomic status.

Methods:
From 2009 to 2014, residents in 5 public rental flat enclaves (n = 936); and in neighbouring owner-occupied precincts (n = 1060) were assessed for a) health screening participation; and b) chronic disease treatment compliance. We measured distance from blocks to the nearest subsidised GP clinics and polyclinics, then evaluated its link to health screening/treatment compliance in both populations.

Results:
In the rental flat population, proximity to polyclinics was independently associated with lower screening participation for: hypertension (aOR = 0.61, CI, 0.42-0.88, P = 0.009); hyperlipidaemia (aOR = 0.56, CI, 0.38-0.82, P = 0.003); cervical cancer (aOR = 0.17, CI, 0.06-0.48, P = 0.001); and breast cancer (aOR = 0.15, CI, 0.07-0.35, P <0.001). In contrast, the owner-occupied population showed higher screening participation for diabetes (aOR = 2.39, CI, 1.06-5.36, P = 0.035); hyperlipidaemia (aOR = 1.61, CI, 1.00-5.99, P = 0.050; and breast cancer (aOR = 6.35, CI, 1.85-21.74, P <0.001). Proximity to subsidised GP clinics was independently associated with higher screening participation for diabetes (aOR = 1.69, CI, 1.06-2.72, P = 0.029); hyperlipidaemia (aOR = 1.97, CI, 1.25-3.08, P <0.001); and breast cancer (aOR = 3.21, CI, 1.47-6.99, P = 0.003) in the rental flat population. For chronic disease management in the rental flat population, proximity to polyclinic was independently associated with lower awareness of hypertension (aOR = 0.32, CI, 0.13-0.79, P = 0.014), lower compliance to hyperlipidaemia treatment (aOR = 0.39, CI, 0.19-0.79, P = 0.009); through better control of hypertension (aOR = 1.96, CI, 1.04-3.64, P = 0.036); while proximity to subsidised GP clinics was associated with better compliance with hyperlipidaemia treatment (aOR = 2.57, CI, 1.33-4.98, P = 0.005).

Discussion & Conclusion:
In low SES rental flat populations, proximity to polyclinic was generally associated with poorer participation in screening and poorer chronic disease management, while proximity to subsidised GP clinics was associated with better screening participation.

PP-PCR-03

Attitudes, Skills and Knowledge of Primary Healthcare Nurses on the Use of Evidence-based Nursing (EBN) and Barriers Influencing the Use of EBN in the Primary Healthcare Setting

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Background & Hypothesis:
The study aimed to explore the attitude, skills and knowledge of primary healthcare nurses on the use of EBN and to identify barriers on the use of EBN across 9 polyclinics under NHGP.

Methods:
A cross-sectional survey was done on nurses in all the 9 polyclinics under NHGP from 30 March 2015 to 10 April 2015. All registered nurses who are currently working in the polyclinics are included in the study. There are a total of 14 questions in the survey, of which 6 are related to demographic information, 5 related to attitude and knowledge of EBP and 3 related to the ability to utilise resources when searching for EBP.

Results:
A total of 219 nurses completed the survey. Fifty-three percent of the nurses had positive attitude towards adoption of EBN with advanced practice nurses, nurse clinicians and nurse managers being the most likely to have that positive attitude; 57% of the nurses felt that the workload is too high to be updated with new evidence and 50% felt that EBN has limited utility. Though 54% of the nurses had obtained a bachelor degree or higher, only 13.8% were proficient in EBP knowledge and skills. Ninety-two percent of the nurses felt that there are barriers towards EBN adoption with most identifying difficulty finding time at workplace to search and read research articles.

Discussion & Conclusion:
Primary healthcare nurses generally have a positive attitude towards the adoption of EBN but the lack of EBP knowledge and skills coupled with insufficient time hindered nurses in the use of EBN in their practices.

PP-PCR-04

Evaluation of an Interactive Health Corner

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Background & Hypothesis:
Health promotion is a valuable and cost-effective way to maintain a healthier community. Current health promotion initiatives have been static and are often missed. Studies show that cooking demonstrations accompanied by cognitive learning resulted in positive effects as compared to usual education methods. Hence, the first interactive Health Corner (HC) was developed, with daily cooking demonstrations and food tasting sessions to evaluate the effectiveness of this mode of health promotion.

Methods:
Self-administered questionnaires were carried out over 9-month period from August 2014 and a total of 4132 forms were collected. Bivariate analysis was used to study the association of knowledge gained and attitude. Majority of participants were Chinese (87%), female (72%), and aged between 50 to 69 years old (69%).

Results:
A total of 98% of participants agreed that the HC was useful. Ninety-five percent were willing to make changes after visiting the health corner and 98% agreed that the corner helped increase their awareness and knowledge of creating healthier meals and making healthier food choices. Ninety-eight percent of the participants obtained 75% correct answers on the knowledge questions. Age, gender and race were associated with willingness to make changes (P <0.001), in particular, males and Indians were the most willing to make changes. Participants aged below 40 years were least willing to make changes. There was no association between knowledge gained and demographics of patients.

Discussion & Conclusion:
The interactive HC had a positive impact of delivering health promotion messages to encourage healthy eating practices. There is potential to develop this initiative into a nationwide health promotion programme with positive benefits over cost.

PP-PCR-05

Trends in Health Screening and Lifestyle Behaviours in a Singaporean Rental Flat Community from 2008 to 2014

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Background & Hypothesis:
The study aimed to evaluate the impact of an access-enhanced intervention on screening adherence in a rental flat community.

Methods:
Trends in health screening adherence and health behaviours amongst residents (aged ≥40 years) of a multi-ethnic public rental flat community in Singapore were observed from 2008 to 2014, comparing against residents staying in owner-occupied flats within the same precinct. Simultaneously, we ran a free, access-enhanced multimodality screening programme in the rental flat community.

Results:
A total of 478 rental and 505 owner-occupied flat residents participated. In the rental flat community, hypertension baseline screening rates improved 18.3% (24/131) in 2008 to 2009 – 44.2% (34/77) in 2012 to 2014 (P <0.001). For diabetes, rates improved 26.2% (43/164) – 49.5% (45/91) (P <0.001). Dyslipidaemia screening improved 18.2% (31/170) – 47.5% (38/80) (P <0.001). Cervical cancer screening improved 2.6% (2/76) – 20.5% (9/44) (P <0.001). Colorectal cancer screening rates (4.4% to 11.6%) and breast cancer screening rates (8.8% to 16.2%) showed an increasing trend. For the owner-occupied community (n = 505), screening rates largely remained stagnant (hypertension: 52.2% to 54.5%, P = 0.059; diabetes: 66.0% to 66.7%, P = 0.434; dyslipidaemia: 53.1% to 57.1%, P = 0.818; colorectal cancer: 17.0% to 23.8%, P = 0.315; cervical cancer: 43.2% to 39.4%, P = 0.914). Only breast cancer screening showed improvement: 10.0% to 24.5% (P <0.001). In the rental flat community, unhealthy behaviours increased, with higher rates of overweight (30.4% to 52.1%, P <0.001), smoking (11.7% to 32.5%, P <0.001) and drinking (1.4% to 8.1%, P <0.001). This shift was also reflected in the owner-occupied community, with higher percentages of overweight and higher drinking rates (P <0.001).

Discussion & Conclusion:
In the (intervention) rental flat community, baseline screening rates improved from 2008 to 2014, compared to owner-occupied flat residents, where screening rates stagnated. Unhealthy behaviours increased in both communities.

PP-PCR-06

The Efficacy of Commonly Used Topical Agents in Patients with Aphthous Stomatitis – A Literature Review

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Background & Hypothesis:
Aphthous stomatitis is a common oral problem encountered in primary care. There are no articles that quantify the efficacy of different topical agents in a single article. This review aimed to quantify and compare the efficacy of various topical agents in the treatment of aphthous stomatitis, based on existing literature.

Methods:
PUBMED and CENTRAL databases were searched for randomised clinical trials evaluating the efficacy of topical agents in patients with aphthous stomatitis. A study with a JADAD score of 3 or more was considered as a good quality trial. Data was extracted and comparison with other agents made using pain score at day 5 of treatment and time to recovery as treatment outcomes.

Results:
A total of 139 journal articles were found. After screening for suitability, 14 articles were selected for comparison. Topical triamcinolone paste was most effective for relieving pain in patients with aphthous stomatitis, reducing pain scores to 0.17 +/- 0.12 after 5 days of treatment. Topical 5% amlexanox paste was most effective in accelerating recovery, reducing mean healing time to 2.56 days, while 0.12% chlorhexidine mouthwash and topical trimacinolone paste reduced mean healing time to 5.38 days and 5.93 days, respectively.

Discussion & Conclusion:
The literature review was limited by poor study quality in several of the selected trials and significant heterogeneity in study outcomes, making direct comparison challenging. Triamcinolone paste, amlexanox paste and chlorhexidine gargle are effective agents in treatment of caused by aphthous ulcers. Further research exploring the effects of combination drug therapy will prove beneficial to improve outcomes in this common condition.

PP-PCR-07

To Improve the Blood Pressure (BP) Control of Hypertensive Patient without Diabetes Mellitus in Ang Mo Kio Polyclinic

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Background & Hypothesis:
Hypertension is the single most important risk factor for early death. A total of 27.3% of Singaporeans between the ages of 30 and 69 years suffer from hypertension. In the 60- to 69-year-old group, more than 50% have hypertension. Thus, BP control in hypertensive will significantly reduce their risks of developing complications of hypertension.

Methods:
Initially, 36 patients were randomly selected for a patient's survey. These include questions on reasons of non-compliance, patient's understanding of hypertension and BP target. With this data and the experience of team members, a cause-and-effect diagram and a Pareto chart were created. The top 3 causes of poor BP control were: lack of patient's knowledge of hypertension, doctors being unaware of BP target and patients not having been updated with change of medications. These causes were then targeted with the aim to improve BP control in hypertensive patients.

Results:
Every month, Ang Mo Kio Polyclinic has around 3700 to 4000 hypertensive visits. Before the study, the average hypertensive with BP controlled within target (<140/90 mmHg) were around 59% to 62%. The interventions include: regular teaching and reminders to doctors, referral of newly diagnosed hypertension and patients with poor insight to care manager. Our doctors and pharmacists would update all patients with their medications change during their visits and they would be offered convidose. Postinterventions, the target has improved to 64% to 67%.

Discussion & Conclusion:
On average, every 1% of improvement will create 400 patients with BP well controlled. Multidisciplinary approach in patient's education is important for their understanding of hypertension and thus their BP is well controlled.

PP-PCR-08

Prescription Errors in Primary Care Setting – How Much Do the Doctors Know?

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Background & Hypothesis:
The study objectives were to find out doctors' knowledge of prescription errors in Singapore polyclinics and corroborate the perceived impact and actual outcome of interventions that reduced errors.

Methods:
Doctors who send prescriptions in one of the clinics of National Healthcare Group Polyclinics were sent an email link of a survey questionnaire that asked about prescription errors. Interventions were carried out as part of a larger intervention study and the result of the most impactful interventions that reduced errors as indicated by the doctors were analysed.

Results:
Seventeen doctors out of 26 (65.38%) answered the questionnaire. Most (82.35%) agreed that there were significant prescription errors in polyclinics. Out of this, 70.59% indicated errors being not that bad and manageable, while for 11.76%, the situation was very bad and for 5.88%, it was not an issue to worry about. The single most common error was perceived to be the omission of drug (35.29%), wrong duration or quantity, and drug interactions (17.65%, respectively) while actual data showed that the commonest errors were wrong dosage (26.76%), omission of drug (15.02%), and wrong duration or quantity (12.21%). It was perceived that the easiest intervention to implement that can reduce errors was for duplications (29.41%), wrong dosage, and omission of the drug (17.65%, respectively) while the most impactful interventions were indicated as omission of drug (23.53%), wrong dosage (17.65%), and drug interactions (11.76%). After 5 months of interventions, the doctors perceived that error rates for wrong dosage and omission of drug had declined significantly.

Discussion & Conclusion:
There is a good corroboration with regard to perceived and actual interventions that result in reducing prescription errors amongst the polyclinic doctors.

PP-PCR-09

Perspectives of Primary Care Staff towards Current MRSA and MSSA Management

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Background & Hypothesis:
Methicillin-resistant *Staphylococcus aureus* (MRSA) and methicillin-sensitive *Staphylococcus aureus* (MSSA) comprise 93.5% of all multidrug-resistant organisms (MDRO) cases in NHGP. Healthcare institutions in Singapore have various but different policies regarding MDRO management and data sharing of outcomes is adhoc. This study investigated the perspectives of primary care staff towards the current management of MRSA and MSSA.

Methods:
A cross-sectional questionnaire survey was conducted on doctors, nurses, physiotherapists and podiatrists of all 9 NHG polyclinics. A total of 299 staff were recruited, with a response rate of 61.8%, and their comments towards current MRSA and MSSA management were analysed.

Results:
A total of 70.5% and 64.8% of respondents felt that currently, educational information and documentation of MRSA/MSSA status in electronic medical records (EMR) are "somewhat sufficient" and "sufficient", respectively. Regarding their ability to educate patients and families on MRSA and MSSA management, 49.4% of respondents reported "very good" or "excellent", 26.0% reported "good", 24.6% reported "poor" or "fair". There were statistically significant differences in responses between nurses and allied health professionals and between doctors and nurses ($P < 0.05$). The top 3 areas of improvement identified were, to provide more education to patients and families, increase staff and patient awareness, and clearer EMR documentation of status.

Discussion & Conclusion:
More education and materials could be provided to patients and staff in primary care, to increase their awareness and involvement in MRSA and MSSA management. Clearer EMR documentation of MRSA/MSSA status would enable staff to manage MRSA and MSSA more effectively. These strategies would require management support and coordination between departments and institutions.

PP-PCR-10

Medication Adherence in Patients with Type 2 Diabetes

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Background & Hypothesis:
Long-term medication therapy is commonly required in treatment of diabetes. Poor medication adherence has resulted in worsening disease prognosis, increasing morbidity and mortality rate, and higher healthcare costs. The study aimed to identify the factors affecting medication adherence among patients with type 2 diabetes mellitus (T2DM).

Methods:
A cross-sectional study using face-to-face questionnaire survey was carried out at 2 polyclinics in Singapore. A total of 186 patients with T2DM were recruited from September 2014 to November 2014. The patients were asked about medication adherence by using the validated Morisky medication. The World Health Organisation Well-Being Index was used to measure psychological wellbeing and Fear of Intimacy with Helping Professionals Scale was used to measure health-seeking behaviours.

Results:
A total of 41% of the T2DM patients are adherent to their medications. Psychological well-being (IRR = 0.97, 95% CI, 0.94-1.0, P = 0.03), helping relationship (IRR = 1.0, 95% CI, 1.0-1.03, P = 0.014), and insulin injection (IRR = 0.06, 95% CI, 0.36-1.0, P = 0.048) are factors positively affecting medication adherence. Every increase in psychological well-being index increases medication adherence by 3%. However, every increase in helping relationship score increases medication non-adherence by 2%. Patients on both oral and insulin injection are 40% higher in medication adherence than those only on oral medications.

Discussion & Conclusion:
Poor psychological well-being is associated with poor adherence. However, patients who engage help from healthcare professionals benefit by improving health and disease management outcomes. Clinicians should determine the factors affecting medication adherence for the patients under their care to ensure optimal clinical outcome for their patients.

PP-PCR-11

Peer, Family and Media Influences on Disordered Eating Behaviours: Mediating Roles of Negative Emotions and Susceptibility to External Influence

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Background & Hypothesis:
Disordered eating patterns and its relationship with external influences (peer, family and media sources) to be thin or healthy are explored among tertiary students. Being susceptible to such external influences and negative emotions (depression, anxiety, and stress), are hypothesised to mediate these relationships.

Methods:
A questionnaire with questions adapted from validated tools was administered to 484 tertiary students. Data analysis was done using SPSS and AMOS. Structural equation modelling work was done to understand relationships between the variables. SPSS Sobel macro tests for statistical significance of any mediation effects, while tests of moderation were done using the SPSS macro script.

Results:
Results indicate that those exposed to pressures to be thin adopt more disordered eating behaviours, while those who experience external influence to be healthy reported lower levels of disordered eating behaviours. Negative emotions mediate the relationship between external pressures to be thin and disordered eating behaviours. Susceptibility to influence mediates the relationship between media influence and disordered eating behaviours.

Discussion & Conclusion:
The results suggest that participants experience multiple sources of pressure on body image. In primary care settings where unhelpful eating behaviours among patients with chronic illnesses are common, psychologists can play a role in assessing and managing underlying negative emotions which can facilitate health behavioural changes through healthy eating. The findings suggest that the messages we communicate to others result in different attitudes and reactions towards eating behaviours. This is encouraging for healthcare professionals who actively promote health messages to patients, which can help shape their attitudes towards enhancing healthy eating behaviours.

Index of First Author

Cheong	Kai Xiong	OP-CR-08	S125
Cheong	Seng Kwing	PP-PCR-01	S501
Cheong	Wan Rong	PP-AH-03	S267
Cher	Wen Qi	PP-PCR-02	S502
Chew	Grace Wei Min	PP-CR-14	S348
Chew	Mei Ling, Cindy	PP-PCR-03	S503
Chew	Tiffany	OP-AH-03	S56
Chew	Wei Da	OP-BSTR-05	S102
Chia	Clement LK	OP-CR-09	S126
Chia	Jia Min Gabrielle	PP-NR-01	S493
Chia	Faith	OP-BSTR-06	S103
Chin	Rowena	YIA-BSTR-01	S39
Chin	Rowena	OP-CR-11	S128
Chin	Weng Loon	PP-AH-04	S268
Chin	Xinyu	PP-HSR-6	S466
Chin	Yuhang Jacob	OP-CR-10	S127
Chirayil	Evangeline	OP-HSR-04	S220
Chirayil	Evangeline	OP-PCR-03	S247
Chng	Hiok Hee	PP-CR-15	S349
Chong	Amanda	PP-CR-16	S350
Chong	Boon Keng	PP-AH-05	S269
Chong	Yi Rui Tricia	OP-CR-12	S129
Choo	Ryan	OP-CR-13	S130
Chow	Angela	OP-CR-14	S131
Chow	Angela	OP-CR-15	S132
Chow	Angela	OP-CR-16	S133
Chow	Angela	OP-CR-17	S134
Chow	Angela	OP-CR-18	S135
Chow	Angela	OP-CR-19	S136
Chow	Angela	OP-CR-20	S137
Chow	Angela	OP-CR-21	S138
Chow	Angela	SG-CIA-01	S25
Chow	Chengzi	PP-HSR-7	S467
Christiaans	Johannes	PP-BSTR-02	S314
Chua	Angeline	PP-CR-18	S352
Chua	Karen	PP-CR-17	S351
Chua	Kenneth Wei De	OP-AH-04	S57
Dalan	Rinkoo	SG-CIA-02	S26
Dallimore	Rachel Kim	OP-AH-05	S58
David	Rebecca	OP-HPE-01	S212
De	Partha	PP-CR-19	S353
Devarajan	Kavya	OP-BSTR-07	S104
Devi	Sandhya	YIA-SP-01	S51
Dhavadas	Gayathiri	PP-NR-02	S494
Dong	Lijuan	SGPCR-O-01	S33
Elangovan	Shalini	OP-BSTR-08	S105
Elumba	Danny Louie Escultor	PP-HSR-8	S468
Er	Chaozer	OP-CR-22	S139
Er	Chaozer	OP-HPE-02	S213
Fernandez	Gemma	OP-AH-06	S59
Foo	Chik Loon	OP-HSR-05	S221
Foo	Chek Wun	PP-CR-21	S355
Foo	Gen Lin	PP-CR-20	S354
Francisco	Erwin Phillip	OP-CR-23	S140
Galamay	Lovel	PP-CR-22	S356

Gan	Suay Hong	PP-CR-23	S357
Gan	Yijin Jereme	OP-CR-24	S141
George	Julie	PP-HPE-01	S452
Ghazali	Faezah	OP-AH-07	S60
Glass	George	OP-HPE-03	S214
Goh	Jin Kun	OP-AH-08	S61
Goh	Mei Lim	PP-PCR-04	S504
Goh	Pei Lin, Pamela	PP-AH-06	S270
Goo	Lay Kian	HPE-RI-02	S20
Goo	Lay Kian	OP-NR-13	S244
Guan	Ying Yi	OP-BSTR-09	S106
Gupta	Bhanu	PP-BSTR-03	S315
Hah	Yan Yee	OP-CR-25	S142
Hap	Daniel	OP-CR-26	S143
Haron	Jazimin	PP-AH-07	S271
Hawkins	Robert	PP-CR-24	S358
Hawkins	Robert	PP-CR-25	S359
Hawkins	Robert	PP-CR-26	S360
Hendriks	Margaret Christian Benjamin	OP-AH-09	S62
Highfield	George	PP-CR-27	S361
Ho	Genevieve	PP-AH-09	S273
Ho	Hanley	OP-CR-27	S144
Ho	Hanley	OP-CR-29	S146
Ho	Hanley	OP-CR-30	S147
Ho	Hanley	OP-CR-32	S149
Ho	Hui Ting	PP-AH-08	S272
Ho	Newfei	OP-AH-10	S63
Ho	Newfei	OP-CR-31	S148
Ho	Newfei	OP-CR-33	S150
Ho	Sean	OP-CR-28	S145
Ho	Shu Fang	OP-HSR-06	S222
Hong	Christina	BP-AH-01	S1
Hong	Isabella	PP-NR-03	S495
Hong	Liyue	OP-CR-34	S151
Hong	Liyue	PP-CR-28	S362
Hou	Han Wei	OP-BSTR-10	S107
Htun	Htet Lin	BP-AH-02	S2
Huang	Shan	OP-AH-12	S65
Huang	Wenjie	OP-CR-35	S152
Hum	Yin Mei Allyn	PP-HSR-9	S469
I Dewa Ayu	Susilawati	PP-BSTR-04	S316
Ibrahim	Annisa Bte	YIA-SP-02	S52
Ibrahim	Muhamad Alif	PP-HSR-10	S470
Iserlis	Danielle	PP-AH-10	S274
Ismail	Noor Hafizah	PP-CR-29	S363
Ismail	Noor Hafizah	PP-HSR-11	S471
Izharuddin	Ezlyn	PP-CR-30	S364
Jayachandran	Balachandran	SG-AH-02	S23
Jeyagurunathan	Anitha	OP-AH-13	S66
Jeyagurunathan	Anitha	OP-HSR-07	S223
Ji	Yang Yang	PP-NR-04	S496
Jitmahanirun	Natpapat	PP-AH-11	S275
Kalyanam	Sriram	PP-HSR-12	S472
Kang	Sin Ee Jasmine	PP-NR-05	S497

Kaur	Palvinder	BP-CR-02	S8
Kee	Ae Ra	PP-CR-31	S365
Kee	Ae Ra	PP-CR-32	S366
Khong	Peck Chui	OP-BSTR-20	S117
Khong	Peck Chui	PP-HPE-02	S453
Khoo	Ai Leng	PP-AH-12	S276
Khoo	Chin Meng	OP-BSTR-11	S108
Kinson	Rochelle	PP-CR-33	S367
Kinson	Rochelle	PP-HPE-03	S454
Kng	Kwee Keng	OP-AH-14	S67
Koh	Cindy	PP-NR-06	S498
Koh	Ee Tzun	PP-CR-36	S370
Koh	Hui Li	PP-AH-15	S279
Koh	Jocelyn	PP-AH-13	S277
Koh	Mervyn	PP-HSR-13	S473
Koh	Puay Kee	PP-AH-14	S278
Koh	Yan Tong	PP-CR-34	S368
Koh	Yan Tong	PP-CR-35	S369
Kok	Trina	OP-CR-94	S211
Koottappal	Blessy Mathew	OP-PCR-04	S248
Krishnasamy	Charmaine	BP-HPE-01	S10
Kuah	Wee Keong Christopher	PP-AH-16	S280
Kwok	Boon Chong	OP-PCR-05	S249
Kwok	Boon Chong	PP-HPE-04	S455
Kwok	Sharon	PP-CR-37	S371
Kyaw	Win Mar	OP-AH-15	S68
Kyaw	Win Mar	OP-AH-16	S69
Kyaw	Win Mar	OP-AH-17	S70
Kyaw	Win Mar	OP-AH-18	S71
Kyi Win	Khin Mar	PP-CR-38	S372
Lau	Soon Lee	PP-AH-29	S293
Lau	Wai Keat	PP-CR-39	S373
Lee	Bing Howe	OP-CR-37	S154
Lee	Chuen Peng	PP-CR-41	S375
Lee	Chuen Peng	PP-CR-43	S377
Lee	Chun Fan	PP-CR-42	S376
Lee	Eng Sing	OP-PCR-06	S250
Lee	Eng Sing	OP-PCR-07	S251
Lee	Eng Sing	OP-PCR-08	S252
Lee	Hui Xian Acacia	PP-CR-45	S379
Lee	Hwee Chyen	BP-CR-03	S9
Lee	Jin Hyun	PP-CR-47	S381
Lee	Jye Chyi	OP-AH-19	S72
Lee	Marcus	PP-CR-46	S380
Lee	Sara-Ann	OP-AH-20	S73
Lee	Siok Ying	PP-AH-17	S281
Lee	Tau Hong	OP-CR-36	S153
Lee	Qin Yi	PP-CR-44	S378
Leong	Candice	PP-CR-48	S382
Leong	Po Wey	OP-CR-38	S155
Leong	Tricia Xin Yi	PP-HSR-14	S474
Leow	Mabel Qi He	OP-CR-39	S156
Leow	Mabel Qi He	OP-NR-03	S234
Leow	Mabel Qi He	OP-NR-04	S235
Leow	Mabel Qi He	OP-NR-05	S236

Leow	Mabel Qi He	OP-NR-06	S237
Lew	Jin Wen Sennen	PP-CR-49	S382
Li	Zongbin	OP-PCR-10	S254
Li	Zongchen	OP-PCR-09	S253
Li	Zongchen	PP-PCR-05	S505
Lim	Choon Huat, Rodney	OP-AH-22	S75
Lim	Dwee Wee	OP-CR-41	S158
Lim	Hua-Liang Joel	PP-CR-52	S386
Lim	Hua-Liang Joel	PP-CR-53	S387
Lim	Huey Ying	OP-CR-40	S157
Lim	Joelle	OP-CR-43	S160
Lim	Lisa Lynn	PP-HSR-16	S476
Lim	Louis Wei Yi	YIA-CR-01	S42
Lim	Mei Chin	PP-CR-56	S390
Lim	Poh Lian	PP-CR-54	S388
Lim	Shu Ping	PP-AH-18	S282
Lim	Su Chi	BP-BSTR-01	S4
Lim	Su Lin	OP-AH-21	S74
Lim	Suan Seng Joseph	PP-HSR-15	S475
Lim	Wei Xiang	OP-CR-42	S159
Lim	Xin Rong	PP-CR-55	S389
Lim	Zhen Yu	YIA-SO-01	S48
Lim	Zhen Yu	OP-HSR-08	S224
Lim	Ziying Vanessa	PP-CR-50	S384
Lim	Ziying Vanessa	PP-CR-51	S385
Lin	Liang	BP-HSR-01	S13
Lin	Michelle Xueqin	PP-CR-57	S391
Lin	Yongxing Patrick	OP-NR-07	S238
Lingam	Pravin	PP-CR-58	S392
Lingam	Pravin	PP-CR-59	S393
Liu	Huimin	OP-CR-44	S161
Liu	Sylvia	PP-CR-40	S374
Liu	Wen Chun	PP-CR-60	S394
Lo	Su Chun Robert	PP-CR-61	S395
Lo	Su Chun Robert	PP-CR-62	S396
Lo	Tong Jen	PP-CR-63	S397
Loh	Abigail	PP-HSR-17	S477
Loh	Seow Faan	PP-CR-64	S398
Long	Valencia	PP-CR-65	S399
Loong	Chen Yi	PP-AH-19	S283
Low	Han Loong	OP-BSTR-12	S109
Low	Joshua	OP-AH-23	S76
Low	Serena	OP-CR-45	S162
Lu	Frank	PP-AH-20	S284
Magpantay	Gerlie	PP-HSR-18	S478
Mahesh	Mithila	OP-HSR-09	S225
Marimuthu	Kalisvar	OP-CR-46	S163
Meng	Fanwen	PP-HSR-19	S479
Mohd Noor	Nor Alia	OP-CR-47	S164
Mok	Kwang How	OP-CR-48	S165
Mok	Kwang How	OP-CR-49	S166
Mok	Kwang How	PP-CR-66	S400
Molina	Joseph	PP-HSR-20	S480
Murakami	Tsurayuki	OP-AH-24	S77
Naik	Sandeep Raj Kala	PP-CR-67	S401

Natarajan	Suresh Khanna	OP-CR-50	S167
Natarajan	Suresh Khanna	OP-CR-51	S168
Ng	Alan	PP-HSR-23	S483
Ng	Chia Hau	PP-PCR-07	S507
Ng	Chong Jin	BP-CR-01	S7
Ng	Choon Aik	YIA-SO-02	S49
Ng	David Wei Liang	PP-PCR-06	S506
Ng	David Wei Liang	SGPCR-O-02	S34
Ng	David	OP-PCR-11	S255
Ng	Davin	OP-BSTR-13	S110
Ng	Jingwen	OP-CR-53	S170
Ng	Michelle	OP-CR-52	S169
Ng	Oon Tek	PP-BSTR-05	S317
Ng	Oon Tek	YIA-BSTR-02	S40
Ng	Pamela	PP-CR-68	S402
Ng	Puay Shi	PP-AH-21	S285
Ng	Teresa	OP-AH-25	S78
Ng	Wei Ling	PP-HSR-22	S482
Ng	Wei Xiang	OP-CR-54	S171
Ng	Yi Kang	PP-HSR-21	S481
Ngo	Wei Kiong	OP-CR-55	S172
Ngo	Wei Kiong	YIA-CR-02	S43
Nieh	Chih Meng	BP-HSR-02	S14
Nijal	Fazila	BP-NR-01	S16
Oh	Jin Kyoung	PP-CR-69	S403
Ong	Hui Lin	OP-AH-26	S79
Ong	Kiat Hoe	PP-CR-70	S404
Ong	Marc	PP-CR-72	S406
Ong	Poo Lee	PP-CR-71	S405
Ong	Rebecca	PP-AH-22	S286
Ong	Seow Theng	PP-BSTR-06	S318
Ong	Wei Ern	PP-AH-23	S287
Oo	Aung Myint	OP-CR-56	S173
Oo	Aung Myint	OP-CR-57	S174
Ooi	Say Leong	SGPCR-P-01	S36
Pan	Shaw Teng Darius	OP-PCR-12	S256
Pan	Yunyi	YIA-SP-03	S53
Pang	Shirlene	OP-AH-27	S80
Pang	Junxiong, Vincent	OP-BSTR-14	S111
Peh	Wee Ming	PP-HSR-24	S484
Pek	Sharon	OP-CR-58	S175
Peng	Cheng Yu	PP-AH-24	S288
Phang	Lai Yee	SG-NA-02	S31
Picco	Louisa	OP-AH-28	S81
Picco	Louisa	OP-HSR-10	S226
Poh	Xue Wei Wendy	PP-CR-73	S407
Poi	Choo Hwee	BP-HPE-02	S11
Polonikov	Alexey	PP-BSTR-07	S319
Polonikov	Alexey	PP-BSTR-08	S320
Polonikov	Alexey	PP-BSTR-09	S321
Polonikov	Alexey	PP-BSTR-10	S322
Polonikov	Alexey	PP-BSTR-11	S323
Polonikov	Alexey	PP-BSTR-12	S324
Polonikov	Alexey	PP-BSTR-13	S325
Polonikov	Alexey	PP-BSTR-14	S326

Polonikov	Alexey	PP-BSTR-15	S327
Polonikov	Alexey	PP-BSTR-16	S328
Polonikov	Alexey	PP-BSTR-17	S329
Polonikov	Alexey	PP-CR-74	S408
Polonikov	Alexey	PP-CR-75	S409
Polonikov	Alexey	PP-CR-76	S410
Poo	Kuei Poi Reena	PP-AH-25	S289
Poremski	Daniel	OP-HSR-11	S227
Pradeep Paul	George Gunapal	PP-HPE-09	S460
Pramono	Zacharias Aloysius Dwi	BP-BSTR-02	S5
Rahmat	Juwita	OP-BSTR-15	S112
Rapisarda	Attilio	OP-CR-59	S176
Rekhi	Gurpreet	BP-AH-03	S3
Sagayadevan	Vathsala	OP-AH-29	S82
Saiful	Sri Fairuz Baizuri	PP-AH-26	S290
Sambasivam	Rajeswari	OP-AH-30	S83
Santosa	Anindita	PP-HPE-05	S456
Sathe	Akshata Babulal	PP-CR-77	S411
Saxena	Nakul	PP-HPE-06	S457
Saxena	Nakul	PP-HSR-25	S485
Say	Xian Jue	OP-CR-60	S177
Schaefferkoetter	Joshua	OP-CR-61	S178
Schaefferkoetter	Joshua	PP-CR-78	S412
Seah	Sok Eng	OP-AH-11	S64
See	Yuen Mei	OP-AH-31	S84
Seng	Wei Ren Daniel	OP-CR-62	S179
Seow	Lee Seng Esmond	OP-HSR-12	S228
Shafie	Saleha	YIA-HSR-02	S46
Siddiqui	Shahla	OP-CR-63	S180
Siddiqui	Shahla	OP-HPE-04	S215
Siddiqui	Shahla	OP-HPE-05	S216
Sim	Eran	PP-CR-79	S413
Sim	Ming Ann	OP-CR-64	S181
Sin	David Yang Ern	PP-HSR-26	S486
Soh	Jasmine	OP-AH-32	S85
Soh	Wei Jie	PP-AH-27	S291
Soo	See Ann	PP-AH-28	S292
Su	Jun	OP-CR-65	S182
Su	Su	PP-CR-80	S414
Sudalaimuthu	Vasanthi	SG-NA-03	S32
Sule	Ashish Anil	PP-CR-81	S415
Sule	Ashish Anil	PP-CR-82	S416
Sule	Ashish Anil	PP-CR-83	S417
Sum	Min Yi	OP-CR-66	S183
Sung	Sharon	OP-HSR-13	S229
T	Jegathesan	OP-CR-67	S184
Tai	Wai Ling Stephanie	PP-AH-30	S294
Tai	Yinxia	OP-CR-68	S185
Taiju	Rangpa	PP-PCR-08	S508
Tan	Aaron	OP-CR-70	S187
Tan	Alvin	OP-CR-76	S193
Tan	Cher Heng	PP-CR-89	S423
Tan	Cher Heng	PP-CR-90	S424
Tan	Feng Ling Grace	OP-CR-69	S186
Tan	Huei Nuo	PP-CR-85	S419

Tan	Hwee Koon	PP-AH-36	S300
Tan	Jasmine	PP-AH-31	S295
Tan	Jolene	PP-AH-35	S299
Tan	Jonathan	PP-CR-88	S422
Tan	Kara-Anne	YIA-SO-03	S50
Tan	Kian Wei	OP-CR-75	S192
Tan	Li Ling	PP-AH-34	S298
Tan	Li Ting	OP-AH-34	S87
Tan	Mark	PP-CR-86	S420
Tan	Mark	PP-CR-87	S421
Tan	Min-En	PP-AH-32	S296
Tan	Ming Yuan	OP-CR-72	S189
Tan	Sharon Chay Huang	PP-NR-08	S500
Tan	Shu Zhen	PP-HSR-27	S487
Tan	Soak Buay	PP-NR-07	S499
Tan	Sze Chuan	PP-AH-37	S301
Tan	Tzuu Ling	OP-NR-12	S243
Tan	Wen Er, Charlotte	OP-BSTR-16	S113
Tan	Wen Er, Charlotte	PP-BSTR-19	S331
Tan	Xiling	OP-AH-33	S86
Tan	Xin Ru	OP-BSTR-17	S114
Tan	Xin Ru	PP-BSTR-18	S330
Tan	Yan Ting, Jolene	OP-AH-35	S88
Tan	Yen Pin	OP-CR-71	S188
Tan	Yeong Tze Wilnard	OP-CR-74	S191
Tan	Yeow Leng	PP-CR-84	S418
Tan	Yi Ren	PP-AH-33	S297
Tan	You, Julia	OP-CR-73	S190
Tang	Charmaine	HPE-RI-03	S21
Tang	Ee Ling Serene	OP-CR-77	S194
Tang	Su Shing	OP-AH-36	S89
Tay	Hui Lin	PP-AH-38	S302
Tay	Kai Hong	OP-CR-79	S196
Tay	Laura	OP-CR-78	S195
Tay	Laura	SG-CIA-03	S27
Tee	Lee Huan	PP-AH-39	S303
Teh	Daniel	OP-CR-80	S197
Teng	Janet	PP-AH-48	S312
Teo	Jane	PP-CR-91	S425
Teo	Seow Yee	PP-AH-40	S304
Teo	Sok Huang	PP-PCR-09	S509
Teo	Sok Huang	SGPCR-P-02	S37
Teo	Song Kim Michael	PP-CR-92	S426
Teo	Wan Yee	PP-BSTR-20	S332
Teo	Wee Sheng Kelvin	YIA-HSR-03	S47
Teo	Winnie	PP-HPE-07	S458
Tey	Hong Liang	OP-BSTR-18	S115
Tey	Hong Liang	SG-CIA-04	S28
Tham	Yoke Ying	OP-AH-38	S91
Thng	Tien Guan	SG-CIA-05	S29
Thong	Bernard	PP-CR-93	S427
Thuzar Tint	Nyein	OP-CR-81	S198
Toh	Hui Jin	PP-HPE-08	S459
Tong	Qian Hui	OP-CR-82	S199
Tsao	Kin Kwok Stephen	OP-CR-83	S200

Tso	Allison Ching Yee	PP-CR-94	S428
Turabe	Fazil	YIA-BSTR-03	S41
Ubana	Regina Lua	OP-NR-08	S239
V	Thamilselvi	PP-AH-41	S305
Vaingankar	Janhavi	SG-AH-03	S24
Venkatachalam	Jonathen	PP-CR-95	S429
Venkatachalam	Jonathen	PP-CR-96	S430
Venkatachalam	Jonathen	PP-CR-97	S431
Venkatachalam	Jonathen	PP-CR-98	S432
Venkatachalam	Jonathen	PP-CR-99	S433
Ventura	Anna Luwila	PP-AH-46	S310
Vijakumar	Kayshini	PP-CR-100	S434
Wang	Mingyuan	OP-CR-84	S201
Wang	Na	PP-PCR-10	S510
Wang	Qingli	OP-PCR-13	S257
Wang	Yuehan	PP-HSR-28	S488
Wee	Nicole	OP-CR-85	S202
Wei	Yuan	PP-CR-101	S435
Wing	Tracey	YIA-CR-03	S44
Won	Tin Chiang	OP-PCR-14	S258
Wong	Chia Siong	PP-CR-106	S440
Wong	Chia Siong	PP-CR-107	S441
Wong	Chia Siong	PP-CR-108	S442
Wong	Chia Siong	PP-CR-109	S443
Wong	Chin Jung	PP-CR-102	S436
Wong	Ding Sheng Melvin	PP-CR-105	S439
Wong	Hui Mei	OP-AH-42	S95
Wong	Guo Xia	PP-CR-103	S437
Wong	Guo Xia	PP-CR-104	S438
Wong	Lai Yin	BP-HSR-03	S15
Wong	Lai Yin	PP-HSR-29	S489
Wong	Mei Yin	OP-PCR-17	S261
Wong	Mei Yin	OP-PCR-18	S262
Wong	Mei Yin	OP-PCR-19	S263
Wong	Mei Yin	SGPCR-P-03	S38
Wong	Sabrina	OP-PCR-15	S259
Wong	Sabrina	OP-PCR-16	S260
Wong	Siew Li	OP-AH-40	S93
Wong	Siew Li	OP-AH-41	S94
Wong	Trina	OP-AH-39	S92
Wong	Yew Chong Kester	OP-BSTR-19	S116
Wong	Yoke Poh Audrey	BP-NR-02	S17
Wong	Zi Jun	PP-AH-42	S306
Woo	Ivan Mun Hong	OP-AH-43	S96
Xie	Huiting	OP-NR-09	S240
Xu	Tianma	OP-AH-44	S97
Yam	Michael	PP-CR-110	S444
Yang	Yi	PP-CR-111	S445
Yang	Yuxin	OP-CR-87	S204
Yang	Zixu	OP-CR-86	S203
Yao	Fengyuan	PP-CR-112	S446
Yap	Ai Bee	PP-AH-43	S307
Yap	Ai Bee	PP-AH-44	S308
Yap	Ai Bee	PP-AH-45	S309
Yap	Chee Khong	SGPCR-O-03	S35

Yap	Joyce	BP-HPE-03	S12
Yap	Ming Quan Wayne	PP-CR-113	S447
Yeo	Benson	OP-CR-89	S206
Yeo	Danson	OP-CR-88	S205
Yeo	Shanwen Charleen	OP-CR-91	S208
Yeo	Vera	OP-CR-90	S207
Yew	Kuo Chao	PP-CR-115	S449
Yew	Pey Ying Suzanne	PP-CR-114	S448
Yin	Chu Yang Bryan	PP-CR-116	S450
Yin	Hao	OP-NR-10	S241
Yip	Vivien	PP-CR-117	S451
Yip	Wai Kin	OP-NR-11	S242
Yu	Yue	OP-PCR-20	S264
Yuan	Wei	OP-CR-92	S209
Zainuldin	Rahizan	OP-CR-93	S210
Zeng	Weiting	PP-PCR-11	S511
Zhang	Yunjue	OP-AH-37	S90
Zhang	Xiao	PP-BSTR-21	S333
Zhang	Xiaojin	PP-HSR-30	S490
Zhang	Xiaojin	PP-HSR-31	S491
Zhang	Xiaojin	PP-HSR-32	S492
Zhao	Yingjiao	OP-HSR-14	S230
Zhu	Xiaoli	BP-NR-03	S18