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Singapore Health & Biomedical Congress (SHBC) 2016

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HPE-RI-01

Psychotherapy Training – Does it Make Better Doctors? An Evaluation of Psychiatry Self-Efficacies and Workplace-based Assessments

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Background & Hypothesis:
In 2010, Singapore adopted the US-based psychiatry residency programme, heralding major changes in the curriculum. This included the unprecedented introduction of psychotherapy training, an evidence-based treatment for various psychiatric disorders. Recognising the need for outcome evaluation, this study aims to explore the impact of psychotherapy training on core competencies in psychiatry and psychotherapy.

Methods:
This exploratory mixed methods study used 3 sources of data: 1) an anonymous online survey measuring knowledge, attitudes and confidence in psychotherapy, pre-post one academic year for all trainees (n = 62), 2) de-identified data of workplace-based assessments of the 6 ACGME-I and psychotherapy competencies for residents (n = 15) who went through psychotherapy posting, and 3) focus group discussions (n = 10) with residents (R3) who completed their psychotherapy posting.

Results:
Descriptive statistics, effect sizes and graphs were used in exploratory analyses. Senior residents were more confident in all aspects of psychotherapy compared to ASTs (Cohen's d from 0.07 to 1.11). R3 also showed increased confidence in all aspects psychotherapy pre-post their psychotherapy postings. Positive correlations between progression in psychotherapy competencies and progression in patient care competencies also suggested that the benefits could translate to clinical practice. This was supported by findings on improvement in how residents communicate and interact with patients from the focus group discussions.

Discussion & Conclusion:
Psychotherapy training has resulted in improved confidence in psychotherapy, and core competencies in psychiatry. Further evaluation of the impact on patient care and integration in clinical practice will strengthen understanding of psychotherapy on clinical care outcomes.

HPE-RI-02

Perception of Learning Environment and its Relationship with Stress, Burnout Levels, and Coping Strategies in Psychiatry Residents

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Background & Hypothesis:
Burnout in medical residents has been found to affect their work performance and general health and high levels of unrelenting stress is associated with burnout. Learning environment (LE) and coping strategies were found to be associated with stress levels. Based on previous findings, we hypothesised that perception of poorer LE and specific coping mechanisms will correlate with stress and burnout levels.

Methods:
Sixty-seven psychiatry residents within the National Psychiatry Residency Programme, across five residency years were assessed on their perceptions of LE, stress, burnout levels, and coping strategies using the Postgraduate Hospital Educational Environment Measure, Perceived Stress Scale, Oldenburg Burnout Inventory, and Brief COPE scales. T-test and one-way ANOVA were used to compare the above variables between genders and years of residency. Correlation was used to examine relationships between the variables of interest.

Results:
Overall perception of LE was more positive than negative (111.53 ± 1.771). Perceptions of LE did not differ between genders or years of residency. Perception of LE negatively correlated with stress and burnout levels (all $P < 0.001$). Stress and burnout (exhaustion and disengagement) positively correlated with mainly maladaptive coping strategies – behavioural disengagement, self-blame, self-distraction, venting (all $P < 0.05$). Burnout (disengagement) negatively correlated with positive reframing ($P = 0.022$).

Discussion & Conclusion:
Our findings suggest that poorer perception of LE by psychiatry residents and specific coping strategies are associated with greater stress and burnout levels. The data suggest that addressing different facets of learning environment and promoting (e.g. greater engagement, sharing) and reinforcing (e.g. positive reframing) more adaptive coping strategies may reduce stress and burnout in psychiatry residents.

HPE-RI-03

Comparing Healthcare Career Choice Influences Among First-Year Healthcare Students in a Singapore University

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Background & Hypothesis:
The ageing population has been a global issue leading to chronic shortages among healthcare professionals. A strategy such as expanding the healthcare education pipeline is crucial in meeting the healthcare demand. In recent years, educational institutions are increasingly interested in understanding career choice influences among school leavers, so as to attract them into a healthcare career. In this study, career choice influences are explored and compared among different healthcare courses.

Methods:
A descriptive-comparative quantitative study was conducted. A valid and reliable 35-item tool which measures 6 healthcare career choice factors (personal interest, prior healthcare exposure, self-efficacy, job nature, job prospects, social influences) was used to examine career choice influences among students. The questionnaire was administered online to all first-year students undertaking medicine, nursing, pharmacy, dentistry, and social science courses at the National University of Singapore.

Results:
A total of 707 students responded to the questionnaire, yielding a response rate of 82.1%. Career choice influences were found to differ significantly ($P < 0.001$) among healthcare students. Medical students indicated personal interest and prior healthcare exposure as strong motivating factors to pursue a career in medicine. Dentistry and pharmacy students see job prospects and self-efficacy as important career choice factors. Nursing students rated social influences as the least important career choice factors while social science students rated all other career choice factors lowest among all healthcare groups.

Discussion & Conclusion:
This study identifies the healthcare career choice influences of students from different healthcare groups. Such information is timely in addressing the current healthcare workforce shortage and guiding educational institutions and policymakers in recruitment strategies implementation.

SHBC-SA-01

Preserved Functional Performance Despite Loss of Muscle Mass: Muscle Quality Matters

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Background & Hypothesis:
Pre-sarcopenia is characterised by preserved physical performance despite muscle mass loss, with this dissociation highlighting the importance of muscle quality. We sought to: 1) compare muscle quality across non-, pre- and sarcopenic stages, and 2) identify risk factors for pre-sarcopenia and sarcopenia.

Methods:
A total of 200 community-dwelling, cognitively and functionally-well adults aged >50 years were categorised into "no sarcopenia" (54.5%), "pre-sarcopenia" (20.5%) and "sarcopenia" (25%) based on the European Working Group on Sarcopenia, employing Asian cutoffs. Muscle quality was defined by ratio of grip and knee extension strength to arm and leg lean mass respectively (g/g). We compared demographics, comorbidities, functional and physical performance, nutrition, and biochemical parameters across groups. Frailty (Buchmann's criteria) and physical performance were re-assessed at 1 year.

Results:
Pre-sarcopenic subjects had the highest arm (11.9 [10.7-13.5], 14.1 [13.1-16.2], 11.4 [9.6-13.2], P <0.001) and leg (6.2 [5.4-7.4], 7.1 [6.3-8.6], 6.8 [5.8-7.9], $P = 0.006$] muscle quality, being less frail at baseline and 1 year (P <0.001) than sarcopenic group. Sarcopenic subjects were older (P <0.001), with increasing malnutrition risk across groups ($P = 0.026$). Insulin-like growth factor-1 (IGF-1) was lowest in sarcopenic women ($P = 0.006$). Myostatin was lowest in pre-sarcopenic men ($P = 0.051$). In multinomial logistic regression by gender, older age was a common risk factor for sarcopenia. Amongst women, malnutrition was an independent risk factor for sarcopenia (OR = 6.64, 95% CI 1.08-40.76, $P = 0.041$), with higher IGF-1 being protective ($P = 0.071$). Amongst men, higher serum myostatin reduced odds for pre-sarcopenia ($P = 0.075$).

Discussion & Conclusion:
Preservation of muscle quality protects against frailty despite muscle mass loss. While nutrition is important in maintaining muscle mass, IGF-1 and myostatin may contribute to qualitative changes in older women and men, respectively.

SHBC-SA-02

Exploring the Coping Strategies of Domestic Helpers Caring for the Elderly in Singapore

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Background & Hypothesis:
The stress foreign domestic workers experience as caregivers to the elderly in Singapore have not been previously examined. This study explored the caregiving experience and coping strategies of foreign domestic workers caring for the elderly in Singapore.

Methods:
A descriptive qualitative design was used in this study. Foreign domestic workers were selected using purposive sampling. Individual face-to-face semi-structured interviews were conducted in a private setting. Interviews were audio-recorded and transcribed verbatim. Interviews were conducted until data saturation was achieved. Data collected were analysed using thematic analysis.

Results:
A total of 11 foreign domestic workers from Indonesia (n = 6), Philippines (n = 4), and Myanmar (n = 1) were interviewed. The length of caregiving experience ranged from 2 months to 13 years. Subthemes were first identified and then organised into 4 main themes. These themes were "responsibilities", "challenges", "self-coping strategies", and "seeking support".

Discussion & Conclusion:
The findings of this study provided insights to the caregiving experience of foreign domestic workers caring for the elderly in Singapore. This study's findings highlight the need for more support and education on caregiving to be provided to foreign domestic workers. There is also a need to raise awareness of support groups specifically for foreign domestic workers. This study provides important information for future researches exploring interventional strategies that would aid them in reducing their caregiving burden and improve the quality of their care provision.

SHBC-SA-03

A Humanised Mouse Model for Chikungunya Virus Infection

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Background & Hypothesis:
Chikungunya virus (CHIKV) is a mosquito-borne virus that has re-emerged as a significant public health threat in the last decade. Despite this, there is currently no antiviral treatment for chikungunya infection. The availability of good animal models that recapitulate the in vivo pathogenesis of the acute and chronic phases of CHIKV infection is necessary for the development of effective therapeutics. We have recently established a humanised mouse model to aid in the study of CHIKV immunopathogenesis.

Methods:
Newborn NOD-scid Il2rg-/- (NSG) mice were sublethally irradiated and engrafted with human CD34+ fetal liver cells for humanisation. At 12 weeks of age, mice were intravenously inoculated with CHIKV and subsequently harvested at different time-points postinfection to determine levels of viraemia and various cytokines.

Results:
Infection with CHIKV resulted in transient viraemia in the serum, as well as prolonged viraemia in several organs including the liver, spleen, hind limb muscles and brain. CHIKV-specific human immune cell and cytokine responses were also detected in the humanised mice, with elevation of human IL-6 and IFNγ up to 2 months postinfection. Infitrations of human immune cells were observed in the liver and joints as late as 2 months postinfection, suggesting a possible contributing factor in the chronic arthralgia experienced by some patients after CHIKV infection.

Discussion & Conclusion:
The humanised mouse provides an ideal model for the understanding of CHIKV-specific human immune responses and its associated disease pathologies. It could also serve as a platform for the development of therapeutic drugs and vaccines for CHIKV infection.

SHBC-SA-04

Psychopathology Dimensions are Related to Clinical Outcomes and Brain White Matter Integrity in Schizophrenia

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Background & Hypothesis:
Schizophrenia is associated with brain dysconnectivity, poorer psychosocial functioning and affects quality of life (QOL). However, heterogeneity within schizophrenia has posed a major challenge and delineating psychopathology dimensions has been proposed as a solution. This study examined the validity and utility of psychopathology dimensions to reduce heterogeneity in schizophrenia, and hypothesised that these dimensions are associated with clinical outcomes (psychosocial functioning, QOL) and brain white matter (WM) integrity.

Methods:
Overall, 148 patients with schizophrenia were assessed on their nature and severity of psychopathology, psychosocial functioning and QOL. WM fractional anisotropy (FA) and mean diffusivity (MD) values were extracted from their diffusion tensor images. Exploratory factor analysis was utilised to find a best-fitting dimensional psychopathological factor model. The relationships between these factors, psychosocial functioning, QOL, FA and MD were examined via exploratory structural equation modeling and covariates include age, gender, duration of illness and medications prescribed.

Results:
Four factors, namely positive, negative, disorganised and emotional distress factors, fitted the model best. Notably, higher positive factor scores were associated with lower QOL, psychosocial functioning, decreased FA and increased MD in corpus callosum; higher negative factor scores were associated with lower psychosocial functioning, decreased FA and increased MD in brain frontal and temporal regions while higher disorganised factor scores were associated with decreased FA and increased MD in corpus callosum and cingulum (all $P < 0.001$, with Bonferroni correction).

Discussion & Conclusion:
This study not only found that valid psychopathology dimensions in schizophrenia reduce illness heterogeneity, but also facilitate the identification of potential neural biomarkers of psychopathology and clinical outcomes.

SHBC-SA-05

The Efficacy of DPPIV-Inhibitor Therapy among Adult Chinese Patients with Diabetes Mellitus in Singapore

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Background & Hypothesis:
We aimed to determine the patient and diabetes-specific factors that may modify the efficacy of dipeptidyl peptidase-4 (DPP-IV) inhibitors as an add-on therapy amongst adult Chinese Singaporeans with diabetes mellitus (DM).

Methods:
This is a retrospective study from January 2014 to May 2015 of 196 Chinese Singaporeans. Linear mixed models were used to examine the dependent variables, changes in glycemic control (HbA1c) and body weight, over 12 months after initiation of DPPIV-inhibitors. Patient (gender, age, baseline BMI) and diabetes-specific factors (duration of diabetes, baseline HbA1c, insulin therapy, presence of CKD) were included as independent variables. An interaction term, "factor x follow-up time", was introduced as independent variable to examine whether these factors modify the efficacy of DPPIV-inhibitor therapy.

Results:
The interaction term for "factor x follow-up time" was significant for baseline HbA1c, basal-bolus insulin regimen, and presence of CKD. Those with baseline HbA1c >10% had more significant decrease in HbA1c levels as compared to those with baseline HbA1c 8-10% and HbA1c <8% (P <0.001). Patients on basal-bolus insulin had significantly greater reduction in body weight ($P = 0.034$) as compared to those who were either on other regimes or were not on insulin. Patients without CKD had significantly greater reduction in body weight ($P = 0.039$) as compared to those with CKD. Age, gender, baseline BMI and duration of diabetes did not modify the efficacy of DPP-IV inhibitors in this population.

Discussion & Conclusion:
As an add-on therapy, DPPIV-inhibitors are effective in improving glycaemia and body weight in adult Chinese Singaporeans, particularly in patients with baseline HbA1c >10%, without CKD, and who are on basal-bolus insulin therapy.

SG-AH-01

Association between Symptoms of Schizophrenia and Functioning

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Background & Hypothesis:
Schizophrenia has a polymorphic clinical presentation with marked functional impairment. Broadly, most psychopathology can be categorised into positive and negative syndromes, which are also core features of the condition. It is important to examine the relative impact symptom domains have on functioning so treatment strategies can be better formulated. This study aims to examine the association between the different symptom domains and functioning in schizophrenia.

Methods:
Sixty-two individuals with schizophrenia were recruited. Positive and Negative Syndrome Scale (PANSS) was employed as it comprehensively evaluates 30 different symptom items commonly seen in schizophrenia. The Global Assessment of Functioning scale (GAF) was used to evaluate functioning. Calgary Depression Scale for Schizophrenia (CDSS) was used to assess depression. Sociodemographics were recorded. Pearson's correlation was conducted to explore the association between functioning and PANSS subscales – Positive, Negative and General Psychopathology. Linear regression was conducted with GAF as dependent variable and all subscales scores as independent variables. Similar analysis was conducted with employment status as the dependent variable in logistic regression. Age, gender, highest education level and CDSS scores were entered as covariates for both analyses.

Results:
All subscales of the PANSS were significantly associated with GAF (all *P* <0.01). Among the subscales, negative syndrome subscale had the strongest association with GAF (r = -0.618). PANSS negative syndrome subscale also significantly predicted GAF and current employment status.

Discussion & Conclusion:
Negative symptoms were found to be a key determinant of functioning and employment status in schizophrenia. Our findings suggest that management of negative symptoms is crucial in improving functional outcomes in people with schizophrenia.

SG-AH-02

A Qualitative Study Evaluating the Outcomes of Enhanced Recovery after Surgery (ERAS) Protocol in Patients Undergoing Elective Colorectal Surgery through an Interdisciplinary Approach

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Background & Hypothesis:
Enhanced recovery after surgery (ERAS) is an established multidisciplinary approach focused on optimal recovery for patients postoperation. It has been shown to reduce postoperative complications and shorter hospital stays. This has been widely adopted around the world but there is a lack of implementation in Singapore. Hence, we seek to adopt the ERAS protocol and explore its feasibility within the local setting, and evaluate the outcomes in patients undergoing colorectal surgery.

Methods:
We recruited 2 groups of patients − patients who are placed under current care paths (n = 52, from 4 March 2015 to17 May 2016) and patients who underwent care paths with integration of ERAS protocol (n = 37, from 4 March 2015 to 17 May 2016). This includes preoperative counselling, early postoperative oral feeding and early mobilisation with optimal pain control. An interdisciplinary team was formed and a root cause analysis was done to identify possible barriers to the implementation of ERAS protocol. The outcome measures studied were length of hospital stay and readmission percentage.

Results:
Length of stay decreased by 1.05 days (from 8.90 in the pre-ERAS group to 7.95 following the implementation of our ERAS protocol). Readmission percentage also decreased from 13.5% to 2.7%.

Discussion & Conclusion:
The outcome of this study is in line with the research evidence. This will help to spread the ERAS protocol to other postsurgical patients.

SG-AH-03

Simultaneous Recording of Cervical and Ocular Vestibular Evoked Myogenic Potential in Healthy Subjects

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Background & Hypothesis:
The testing of cervical vestibular evoked myogenic potential (cVEMP) has become a well-established approach for the exploration of sacculo-collic pathways. Lately, ocular VEMP (oVEMP) has emerged as an additional test of otolith function, particularly the utricle. With a large scope of tests being completed in busy audiovestibular clinics and with increasing targets for waiting times, there is a need to constantly look for ways to make assessments more efficient whilst maintaining clinical quality. It is suggested that both cervical and ocular VEMP tests may be conducted simultaneously in order to streamline clinical practice. This study was designed to compare the results between individual VEMP and combined VEMPs in terms of mean latencies, peak-to-peak amplitudes and asymmetry ratio (AR).

Methods:
Sixty healthy subjects were enrolled in this study. The test was conducted in a sound-treated room. Each ear was stimulated monaurally using 500 Hz tone burst stimuli presented at 97 dBnHL. During cVEMP recording, subjects were in sitting positions and instructed to turn away from the stimulated ear. In oVEMP recording, subjects were instructed to maintain an up gaze position throughout the test. The combination of cVEMP and oVEMP methods was applied to elicit combined VEMPs responses.

Results:
The paired sample t-test revealed no significant differences between individual versus combined stimulation modes, in terms of mean latencies, peak-to-peak amplitudes and AR for cVEMP and oVEMP.

Discussion & Conclusion:
Simultaneous recording of cervical and ocular VEMPs can be recommended because it generated similar outcomes as compared to the individual VEMP testing.

SG-CIA-01

Effect of Myopia Severity and Retinal Structure on Vision – Results of a Large Prospective Cohort Study

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Background & Hypothesis:
Myopia has high prevalence among Asian populations, especially in younger age groups, and is a significant cause of visual impairment. It is believed that retinal thinning from the stretching of the eyeball contributes to visual impairment. However, the effect of myopia severity on best-corrected visual acuity (BCVA) has not been studied in large cohorts. We hypothesise that visual impairment in myopia is related to both myopia severity and structural effects of retinal thinning. We aimed to evaluate the effect of myopia and retinal thickness on BCVA among young Asian adults.

Methods:
In a prospective cohort study of 698 myopic and 148 control subjects without myopia, BCVA was assessed under standardised (photopic) and dim (mesopic) lighting conditions. Precise measurements of retinal thicknesses were obtained using spectral-domain optical coherence tomography. Multivariate regression analyses adjusting for age, age of onset of myopia, myopia severity, clinical severity of pathologic myopia and retinal thicknesses were performed.

Results:
The mean age of subjects was 21.1 years. Worsening BCVA was associated with higher degrees of myopia, thinner retinae, and age (all P <0.05). For each diopter increase in myopia, mean BCVA worsened by 0.01 logMAR units under standard conditions and 0.02 units in dark conditions (both P <0.001). Mean BCVA reduced by 0.05 logMAR (P = 0.003) and 0.04 logMAR (P = 0.037) respectively for each 100μm decrease in retinal thickness.

Discussion & Conclusion:
This cohort study provides evidence that both myopia severity and structural retinal thinning independently affect BCVA under both standard and dim lighting conditions. This has important implications on the management of patients with high myopia.

SG-CIA-02

Impact of Behavioural and Psychological Symptoms (BPSD) of Dementia on Physical Frailty Progression in Cognitively Impaired Older Adults

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Background & Hypothesis:
The coexistence of physical frailty in the cognitively impaired older adult increases the risk of adverse outcomes. We sought to examine the impact of behavioural and psychological symptoms of dementia (BPSD) on frailty progression in older adults with mild cognitive impairment (MCI) and mild to moderate Alzheimer's dementia (AD).

Methods:
A total of 129 community-dwelling older adults with MCI or mild to moderate AD recruited from a tertiary memory clinic were assessed for physical frailty (Buchmann's criteria) at baseline and 1-year, and categorised as frailty progressors versus non-progressors. BPSD was assessed using the Neuropsychiatric Inventory (NPI) with subdomains (psychotic, motor, mood and inappropriate behaviour). Data on comorbidities, cognitive and functional performance were collected.

Results:
The mean age of the cohort was 77.1 + 6.8. At baseline, 27 patients were frail with a total of 27 subsequently progressing. Age and dementia severity were similar at baseline between groups for the overall cohort. On univariate analyses, NPI motor symptom progression correlated significantly with frailty progression in the overall cohort ($r = -0.224$, $P = 0.029$), and in the MCI subgroup ($r = -0.590$, $P = 0.021$). However, none of the NPI domains was a significant independent predictor for frailty progression in logistic regression models adjusted for age, gender, cognitive impairment and functional status (iADL).

Discussion & Conclusion:
Our findings suggest that greater attention to specific BPSD symptoms may be warranted, with motor symptoms being a potential target for intervention to ameliorate frailty progression in cognitively impaired older adults.

SG-CIA-03

Comparison of Treatment Outcomes among Subtypes of Polypoidal Choroidal Vasculopathy in a Multicentre Randomised Controlled Study

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Background & Hypothesis:
Polypoidal choroidal vasculopathy (PCV) is a leading cause of visual impairment and blindness. It has high prevalence among Asian populations and a variable clinical course. We aimed to describe the frequency and characteristics of PCV subtypes among patients from a multicentre randomised controlled trial, and the impact on clinical outcomes.

Methods:
Sixty patients with macular PCV from a randomised, controlled clinical trial (EVEREST study) were included. Standardised imaging protocols, including indocyanine green (ICGA) and fluorescein angiography (FA), were used to confirm the diagnosis, and classify PCV into 3 subtypes. These were then correlated with visual acuity (VA) and retinal thickness (RT) on optical coherence tomography. Following a standardised treatment regimen, VA and RT were reviewed monthly throughout the study.

Results:
Of the 60 patients, 14.8% had Type A PCV, 50% had Type B and 35.2% had Type C. VA and reduction in retinal oedema varied significantly with PCV subtype. At 6 months, good VA ($\geq$6/12) was highest for Type A compared to Types B and C (100% vs 51.9% vs 10.5%, P <0.001). Type A PCV experienced the largest improvement in vision: 13 letters from baseline vs 8.5 (Type B) and 6.9 (Type C) (P <0.001). Following treatment, reduction of retinal oedema was greatest for Types A and B compared to Type C.

Discussion & Conclusion:
The PCV subtype classification shows a good structure-function relationship and correlates with visual outcomes following standardised treatment. This PCV subtype classification is useful in the treatment and prognostication of PCV in Asians.

SG-CIA-04

Non-Invasive Detection of Polypoidal Choroidal Vasculopathy Using Fluorescein Angiography: An Analysis from a Multicenter, Randomised, Controlled Study

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Background & Hypothesis:
Polypoidal choroidal vasculopathy (PCV) and typical neovascular age-related macular degeneration (nAMD) are both important causes of blindness worldwide. However, the diseases have considerably different visual prognoses and require different treatment regimens. While it has previously been believed that distinguishing PCV and nAMD using fluorescein angiography (FA) is difficult, recent experience suggests that this non-invasive investigation may be useful in differentiating the 2 diseases. We aimed to identify the FA features that differentiate PCV from nAMD cases, and determine their predictive values.

Methods:
In a prospective, multicentre, randomised, controlled study, standardised FA image sets of 76 patients with definitive diagnoses of PCV or nAMD were independently graded using detailed diagnostic algorithms. Predictive values of FA features for PCV compared to nAMD were assessed.

Results:
Several features detected on FA enabled differentiation of PCV from nAMD. The presence of leaking nodular hyperfluorescent areas on FA were strongly predictive of PCV (80.0% vs 20.0%, $P <0.001$, sensitivity 80%, positive predictive value [PPV] 94.1%). Regions with blockage of fluorescence were also indicative of PCV instead of nAMD (61.7% vs 13.3%, $P = 0.001$, sensitivity 95%, PPV 83.8%). An occult pattern of leakage on FA was predominant in patients with PCV compared to nAMD (95.0% vs 73.3%, $P = 0.018$).

Discussion & Conclusion:
Several distinguishing features identified using non-invasive FA were highly predictive of PCV compared to nAMD cases. In situations where more invasive and costly investigations are either unavailable or contraindicated, FA characteristics are useful in identifying patients with PCV, enabling appropriate and timely treatment to be initiated.

SG-CIA-05

A Systems Biology Approach to Unravel the Pathogenesis of Melasma. A Transcriptomic Study of Keratinocytes, Melanocytes and Fibroblasts Obtained via Laser Microdissection of Tissues of a Melasma Patient

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Background & Hypothesis:
Melasma is a common disfiguring disorder whose pathogenesis is not fully understood. Most studies focus on melanocytes but there are no studies elucidating how keratinocyte, melanocyte and fibroblast interact to cause melasma. This study aims to examine the differences in mRNA expression profiles of keratinocytes, melanocytes and fibroblasts seperately, in lesional as compared to non-lesional skin.

Methods:
Paired lesional and non-lesional biopsies were obtained, fixed, paraffin-embedded and subjected to laser capture microdissection. Three cell-types were identified and isolated. Total RNA was extracted and microarray gene expression profile of the 3 different cell-types was performed using the Affymetrix system. ANOVA was performed for lesional sample with contrasts set against non-lesional sample. Hierarchical clustering and Venn diagrams were created. Gene ontology (GO)-enrichment was then performed. A χ^2 test was used to assign each GO term.

Results:
Eight tissue samples were obtained and analysed. Functional analysis of melanocytes genes showed highest score for keratin development and melanin synthesis. Keratinocytes functional analysis showed the importance of complex assembly/disassembly, suggesting that the receiving of melanosomes from melanocytes is important. Fibroblast analysis showed involvement in keratinocytes development and differentiation, suggesting that barrier dysfunction isimportant in melasma pathogenesis.

Discussion & Conclusion:
This is the first study looking at the systems biology of melasma. Our data strongly implicate keratinocytes and fibroblasts as important players and barrier dysfunction, as an important component in melasma pathogenesis. This suggests a paradigm shift in therapeutic options as addressing melanocytes alone is not universally effective and interventions on keratinocytes and fibroblasts functions should be explored.

SG-NR-01

Personal Mastery and Caregiving Mastery: A Tale of Two Cities

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Background & Hypothesis:
Caregiver mastery may buffer against the physical, mental and emotional stress of caregiving. This study compares between predictors of personal mastery (self-perception of control of life events) and caregiving mastery (self-perception of caregiving ability) amongst family caregivers of hospitalised frail elderly. We hypothesise that personal and caregiving mastery represent 2 separate constructs.

Methods:
We interviewed 150 consecutive patient-caregiver dyads admitted to Tan Tock Seng Hospital. Personal and caregiving mastery were assessed using the Pearlin Mastery and Caregiving Competence Scales. Regression models examined associations between mastery (personal/caregiving) and caregiver burden (Zarit Burden Interview, ZBI), distress from behavioural symptoms (Neuropsychiatric Inventory Questionnaire, NPIQ), caregiver and care recipient characteristics. We built further models using validated ZBI 4-factor structure of role strain-demand, role strain-control, personal strain, and worry about performance.

Results:
There was a weak correlation between personal and caregiving mastery (r = 0.2, *P* = 0.014). In multiple regression, 46% of variance in personal mastery was explained by ZBI (b = -0.51), NPIQ (B = 0.16) and ≥10 years of caregiving (B = 0.23); availability of extra help was not significant. For caregiving mastery (12% explained variance), ZBI (B = -0.25) was the only significant predictor. Further analyses by ZBI factor scores revealed that role strain-demands, role strain-control and personal strain are associated with personal mastery, compared with the latter two for caregiving mastery.

Discussion & Conclusion:
Both personal and caregiving mastery were associated with role and personal strain. The weak correlation, coupled with differential explained variance and predictive factors, suggest that personal and caregiving mastery may be distinct targets for treatment interventions.

SG-NR-02

Attitudes and Training Needs of Nurses Providing Physical Health Care for Patients in Long-Stay Mental Health Setting

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Background & Hypothesis:
Patients with serious mental illness (SMI) have poorer physical health and greater mortality than the general population. Nurses working in long-term psychiatric care settings can enhance the physical health of patients. Given nurses' promising role and scarcity of related research, this study aims to examine nurses' attitudes, confidence and involvement in the provision of the physical health care of patients with SMI.

Methods:
A consensus sample of 400 nurses from 24 long-stay psychiatric units participated in a cross-sectional, descriptive survey. They completed the validated Physical Health Attitude Scale (PHASe). Minimisation of biasness and coercion was ensured by having researchers who work in different wards provide study information and by participants submitting the surveys independently.

Results:
Nurses' perceived barriers in attending to patients' physical health was low (M = 18.90 on a SD = 3.97, possible scores from 7 to 35). Similarly, their attitudes and confidence were positive (M = 24.24, SD = 3.02, possible scores from 6 to 30) and (M = 36.52, SD = 5.34, possible scores from 5 to 50), respectively. Unlike attitudes, their confidence was influenced by prior work experience in general settings (r [388] = 0.14, P = 0.02) and education (F [2,313], P <0.001). Nurses with certificate education were more confident than nurses with degree. Training needs relating to managing complications from chronic diseases were identified.

Discussion & Conclusion:
Contrary to popular belief, this study revealed that highly educated nurses were less confident in attending to the physical health of patients in psychiatric settings. Though their attitudes were not easily influenced, their confidence could be potentially impacted through the fulfilment of their training needs.

SG-NR-03

Assessing the Quality of Life of Nurses Working in a Psychiatric Hospital in Singapore

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Background & Hypothesis:
Provision of quality care to patients is closely linked to the quality of care (QOL) of health providers. Nurses in psychiatric setting face an additional stressor of managing potentially violent patients, yet a lack of studies focusing on the well-being of nurses in the context of psychiatric hospitals locally is apparent. This study aimed to identify the QOL of nurses working in a psychiatric hospital in Singapore and examine the factors affecting their QOL.

Methods:
A quantitative, descriptive cross-section study was conducted. A total of 435 nurses were recruited through convenience sampling and they completed the brief version of the World Health Organization Quality of Life (WHOQOL-BREF) and the Sense of Coherence Scale (SOC-13) measuring their QOL and SOC respectively. Data was analysed using SPSS version 21.0.

Results:
Nurses were moderately satisfied with their QOL (M = 63.96, SD =11.91, on a scale of 1 to 100). Male and younger nurses, as well as nurses who worked overtime every week reported lower QOL. SOC was found to have the strongest relationship (r [433] = 0.60, *P* <0.001), as well as being the most influential factor (B = 0.46, *P* <0.001) affecting QOL.

Discussion & Conclusion:
The results indicating moderate QOL in nurses could serve as a reference for policymakers working on staff retention. There is room for organisations to enhance the quality of the workplace. Since SOC is predictive of QOL, more emphasis should be placed in management of coping resources available to nurses to enhance their well-being. New knowledge generated from this study can have impact in future practices.

SGPCR-O-01

Multimorbidity and its Impact on Patients' Anxiety and Depression Status in the Primary Care Setting

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Background & Hypothesis:
Increasingly, patients with chronic conditions are prescribed more medications. One of the measures of the severity of multimorbidity is based on the total number of chronic medications prescribed as in Brilleman and Salisbury (2013). In this study, we evaluated whether severity of multimorbidity was associated with anxiety and depression.

Methods:
A cross-sectional study involving 930 patients was randomly sampled in the polyclinic over 2 years. Patients with coexisting diabetes, hypertension, and dyslipidaemia were recruited. Patient Health Questionnaire for depression (PHQ-9) and General Anxiety Disorder questionnaire (GAD7) were administered to eligible patients. Multivariate regression and correlations were conducted to investigate the association between the severity of multimorbidity and levels of depression and anxiety.

Results:
There were 45.1% females and 55.9% males with a mean age (SD) of 63.6 ($\pm$ 8.47) years. It was found that patients with higher multimorbidity (i.e. higher medication count) also had higher depression scores PHQ9 ($P <0.001$) and were 80% more likely to be single/widowed/divorced (odds ratio: 1.77, $P = 0.012$). However, there was no association between medications count and anxiety score.

Discussion & Conclusion:
Using the total number of chronic medications prescribed as a proxy for the severity of multimorbidity was associated with depression scores but not anxiety score. Even though this was a cross-sectional study, it may be prudent for clinicians to consider screening for depression in those patients with multimorbidity that are prescribed with multiple chronic medications and are single/widowed/divorced. Further work needs to be done to confirm the usefulness of medication count as a measure of the severity of multimorbidity.

SGPCR-O-02

Preventing Diabetes: Enabling Prediabetic Adults to Make Lifestyle Modifications

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Background & Hypothesis:
Prediabetic adults are at high risk of developing type 2 diabetes mellitus (T2DM). Evidence suggests that lifestyle modification is effective in preventing and delaying the onset of T2DM. Hence, this evaluation aims to examine the effectiveness of a primary healthcare-based programme in enabling prediabetic adults to make lifestyle modifications.

Methods:
Thirty-five (14 women, 21 men) prediabetic adults (58 ± 7.3 years) completed NHGP's Diabetes Prevention Programme (DPP). The 3-month programme consists of 6 sessions of educational lectures, activities such as reading food labels and recipe modification, small group discussions on goal setting and problem solving. The outcome measures include self-reported physical activity levels (PAL), fat intake and fibre intake. Paired sample t-test and sign test (non-parametric) were applied to the data using IBM SPSS Statistics v20.0.

Results:
Paired sample t-tests indicated that participants' fibre intake score (17.9 ± 3.7) after the programme was significantly higher than fibre intake score (15.3 ± 4.2) before the programme ($t = 4.83$, $P < 0.001$, $d = 0.82$). The fat intake score (23.9 ± 5.1) after the programme was significantly lower than fat intake score (28.8 ± 5.6) before the programme ($t = 6.15$, $P < 0.001$, $d = 1.04$). Sign test indicated that participants' PAL after the programme was significantly higher than before the programme ($Z = 4.40$, $P < 0.001$).

Discussion & Conclusion:
DPP is effective in enabling prediabetic adults to make lifestyle modifications, specifically reducing fat intake, increasing fibre intake and physical activity levels.

SGPCR-O-03

Factors Associated with Avoidable Admissions for Diabetes in a Primary Care Population

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Background & Hypothesis:
Improved care continuity and a multidisciplinary approach to care have been associated with reduced avoidable admissions for diabetes. A new care model was piloted in Toa Payoh Polyclinic (TPY), where patients with chronic disease were empanelled to a teamlet of family physicians, care managers and care coordinators. This study aimed to study the impact of the new care model, as well as demographic and disease factors on avoidable admissions for diabetes.

Methods:
A total of 2379 diabetic patients enrolled to the TPY teamlet and a matched group of 2379 diabetic patients from Ang Mo Kio Polyclinic were included in the study. Factors studied for association with admissions included enrolment in the TPY teamlet, demographic factors, prior diabetes-related admissions, baseline HbA1C and coexisting chronic diseases. Data on avoidable diabetes admissions made within 1 year of enrolment were obtained from the Ministry of Health. Negative binomial regressions were carried out to investigate the association between avoidable admissions for diabetes and the factors.

Results:
There were significantly less avoidable admissions for diabetes by patients enrolled to the TPY teamlet (111 vs 137, P = 0.043). Avoidable admissions for diabetes was significantly associated with a previous admission for diabetes (OR: 10.38, *P* <0.01), baseline HbA1C >9% (OR: 2.41, *P* = 0.005), co-existing chronic kidney disease (OR: 3.67, *P* <0.001) and stroke disease (OR: 1.78, *P* = 0.017).

Discussion & Conclusion:
The study findings highlight important factors that will identify a diabetic patient who is at risk of an avoidable admission for diabetes.

YIA-BSTR-01

Withaferin A Inhibits LFA-1-Mediated Migration of Human T-Cells by Modulating Kinome Signatures

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Background & Hypothesis:
Withaferin A (WA) is a plant-derived steroid and kinase inhibitor with antitumour, antimetastatic and antiproliferative activities. However, its potential effect(s) on adaptive T-cell immune responses have not yet been explored. This study aimed to evaluate the role of WA on T-cell migration and identify molecular targets through kinome profiling.

Methods:
A migration-triggering model system, in which human T-cells were stimulated via LFA-1/ICAM-1 cross-linking, was used along with transwell migration assays. T-cell responses were determined using high content analysis, PamGene™ kinome arrays, confocal microscopy and Western-immunoblotting.

Results:
T-cell pretreatment with WA significantly inhibited cell migration and chemotaxis in a dose-dependent manner with complete inhibition at 1 uM, as analysed by high content analysis and transwell migration assays. To determine molecular targets of WA, we performed kinomic profiling of WA-treated resting and LFA-1 stimulated T-cells and the data were cross-compared using Kinexus kinase predictor. We identified protein kinases associated with T-cell receptor pathways, including ZAP70, IKKβ and other upstream regulators of WASP kinases as potential targets of WA in T-cells, in addition to several key cytoskeletal elements, such as α/β tubulin, actin cytoskeletal rearrangement proteins and c-cadherins. Further analysis of the WA-interactome in T-cells and subsequent molecular and microscopic validation revealed α-tubulin and its post-translational acetylation as critical cytoskeletal effectors involved in WA-mediated inhibition of T-cell migration.

Discussion & Conclusion:
We established, for the first time, that WA inhibits LFA-1-induced T-cell migration through subtle variations in kinome and tubulin post-translational modifications. These data can be extrapolated for rational drug design against autoimmune diseases and other immune disorders.

YIA-BSTR-02

Design, Synthesis and Biological Evaluation of Ferrocenyl Derivatives as Novel Antihaematological Cancer Agents

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Background & Hypothesis:
The development of organometallic compounds as potential anticancer agents is an active research area. Recent encouraging findings on the antitumour activities of ferrocene-based compounds inspired us to design and synthesise a library of ferrocenyl phosphines and evaluate their anticancer activities against lymphoma and leukaemia cell types.

Methods:
The ferrocenyl phosphines were synthesised via a palladium catalysed hydro-phosphination protocol in high yields. The anticancer activity of the compounds was subsequently assessed by MTS-based colorimetric assay using 5 different leukaemia and lymphoma cell lines. Apoptosis and cell cycle analysis were performed using flow cytometry.

Results:
We designed and successfully synthesised a series of 10 new ferrocenyl phosphine compounds (FD-1 to FD-10), including 3 gold coordination complexes (FD-8, FD-9 and FD-10). Structures and purity of the compounds were confirmed by detailed structural characterisation. All the compounds were screened for their dose-dependent anticancer activities against a panel of 3 non-Hodgkin cutaneous lymphomas (HuT78, MJ and MyLa) and 2 myelogenous leukaemia cell types (K562 and Molm13). We identified the gold coordination ferrocenyl–phosphine FD-10 to be the most promising compound, which exhibited IC50 values of <10 μM with varying sensitivity in all the 5 cancer cell lines tested, IC50 in acute myeloid leukaemia Molm13 cells was 585 nM. Further analysis showed that the anticancer mechanism of FD-10 was by arresting G1/S phase cell cycle progression and inducing apoptosis.

Discussion & Conclusion:
This study identified a new gold coordination ferrocenyl phosphine complex FD-10 as a promising candidate for the potential development of anticancer therapeutics against haematological malignancies.

YIA-BSTR-03

Non-Invasive Optical Coherence Tomography Angiography Evaluation of the Retinal Vasculature and its Relationship with Ocular Factors

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Background & Hypothesis:
Optical coherence tomography angiography (OCTA) is a novel technology for non-invasive assessment of the retinal vasculature, including the foveal avascular zone (FAZ). Earlier investigations were invasive and there is little qualitative or quantitative information on the retinal vasculature in healthy adults. We aimed to determine the effects of demographic and ocular parameters on the retinal vessel density and FAZ size using OCTA.

Methods:
In a prospective cohort study of 170 eyes, healthy volunteers underwent OCTA scans which were independently graded by reading-centre certified graders for FAZ parameters, while density was calculated by a novel AngioAnalytics software. Multiple linear regression analyses were performed to evaluate the impact of factors on density and FAZ area.

Results:
The mean age of the participants was 22.7 years (21-30, SD $\pm$ 1.5). Mean foveal vessel density was 30.6% (range, 19.7-43.4%, SD $\pm$ 4.3). The FAZ size varied from (0.04 - 0.70 mm^2 (mean 0.25 mm^2). Vessel density showed a strong correlation with retinal thickness (Pearson correlation 0.603, P <0.001) and an inverse correlation with FAZ size (-0.862, P <0.001). In addition, vessel density varied significantly with myopia, with moderate myopes having lower vessel density (30.0 vs 33.4%, P = 0.002).By multiple linear regression analysis, vessel density varied significantly with CRT (P <0.001), axial length (P = 0.06) and myopia (P = 0.010)

Discussion & Conclusion:
This study provides evidence for considerable variation of both retinal vessel density and FAZ size among healthy individuals. Ocular factors and myopia significantly influence retinal vessel density and FAZ size, and should be accounted for when assessing them.

YIA-CR-01

Can You Drive Before You Walk? Driving Tests for Patients with Surgically Treated Ankle Fractures

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Background & Hypothesis:
There is no clear consensus on when patients with surgically treated right ankle fractures can return to driving, or how best to assess their fitness to drive. Through a rigorous battery of off-road and on-road tests, we aim to determine if these patients are able to drive a car safely, before weight-bearing has been initiated.

Methods:
A prospective grant-funded clinical trial was conducted. Patients aged 25 to 65 years who underwent surgery for right ankle fractures and held a valid Class III driving license were recruited. The surgeon and an occupational therapist assessed the patients at 2, 6 and 12 weeks postsurgery. A Short Form Musculoskeletal Assessment (SFMA) questionnaire was administered and parameters like braking time were measured using a driving simulator. Patients who met the minimal criteria were then subjected to a full on-road driving test with a driving instructor.

Results:
A total of 23 patients (8 females, 15 males) were recruited. The mean age was 42.8 (28 to 68) years. There was a significant improvement (P <0.05) in the SFMA and braking time at 6 and 12 weeks postsurgery. Nearly all (91%) patients passed the on-road driving test at 6 weeks, before their fractures had healed or weight-bearing was initiated.

Discussion & Conclusion:
This novel study shows that patients with surgically stabilised ankle fractures are able to safely drive cars at 6 weeks postsurgery, even before they have recovered from their injuries. We also showed that the ability to drive correlates with improvements in the SFMA scores and braking times.

YIA-CR-02

Prevalence of Peripheral Arterial Disease and Peripheral Neuropathy in Early-Onset Diabetes in a Cohort of Multiethnic Patients with Type 2 Diabetes

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Background & Hypothesis:
There is now a trend towards younger people presenting with type 2 diabetes (T2D). We hypothesise that age of onset of T2D affects prevalence foot complications (diabetic peripheral neuropathy [DPN] and peripheral arterial disease [PAD]) after correcting for diabetes duration.

Methods:
In a subset of patients from SMART2D study, patients with early-onset T2D (age ≤40years old) and later-onset T2D who were matched for diabetes duration, were selected. Neuropathy was present if an abnormal finding in monofilament (inability to detect <8 of 10 points on either foot) or neurothesiometer testing of ≥25 volts. Ankle-brachial index (ABI) was calculated as the ratio of the higher of the 2 systolic pressures at ankle to the higher of the 2 brachial artery pressures. PAD was defined present if the lower ABI ≤0.9 or previous amputations. Logistic regression was used for statistical analyses (SPSS).

Results:
A total 1027 patients were included in the study, with mean diabetes duration of 17.4 ± 9.0 years. Early-onset T2D (n = 664) compared to later-onset T2D (n = 363), were significantly younger (P <0.0001), had higher BMI (P <0.0001) and waist circumference (P = 0.001), poorer lipid (HDL [P <0.0001], LDL (P = 0.001), triglyceride (P = 0.021)) profiles, higher fasting insulin (P <0.0001), poorer glucose control (fasting glucose [P = 0.001], HbA1c [P <0.0001]) and HOMA-IR (P <0.0001). Overall lower prevalence of PAD (13.8% vs 19.9%) and DPN (12.9% vs 16.4%) in early-onset T2D. After adjustment, lower prevalence of foot complications in early-onset T2D patients was nullified; age and plasma insulin remained statistically significant for foot complications.

Discussion & Conclusion:
While overall prevalence seems lower for early-onset T2D patients, this was attenuated after adjustment for age and other confounders, suggesting that early-onset T2D status is a high-risk group. Strategies targeted to delay or prevent the onset of diabetes are likely to have major impact on prevention of these long-term complications.

YIA-CR-03

Prevalence of and Risk Factors Associated with Latent Tuberculosis among Singapore Residents

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Background & Hypothesis:
Determining latent tuberculosis infection (LTBI) prevalence allows understanding of the potential size of the tuberculosis (TB) reservoir and planning intervention strategies. We performed the first LTBI survey in Singapore, utilising the QuantiFERON Gold In-tube (QFT-GIT) assay, which has shown superior specificity over the tuberculin skin test (TST) in BCG-vaccinated populations.

Methods:
Nation-wide household addresses were randomly selected for enumeration, where Singaporeans or permanent residents (PRs), aged 15-79 years, with substantial stay in the household were identified. One eligible member per household was selected, using the Kish grid, and had a choice of 4 study sites to report to. Each participant answered a questionnaire, assessing medical history (including TB), socioeconomic factors and lifestyle, and provided a blood specimen for the QFT-GIT assay. Participants with positive QFT-GIT results were defined as having LTBI and prevalence risk ratios were obtained using the Modified Breslow-Cox Proportional Hazard Model with robust variance.

Results:
A total of 1682 participants were included for analysis. The prevalence of LTBI amongst residents was 10.7%. When stratified by country of origin, those from India and Southeast Asian countries had the highest prevalence at 32.1% and 27.1% respectively, as compared to 9.2% amongst natives. Multivariate analysis of potential risk factors amongst natives revealed age, gender and educational status to be statistically significant predictors of LTBI.

Discussion & Conclusion:
Given the high prevalence of LTBI amongst residents originating from regional countries, similar studies should be conducted amongst migrants in Singapore to improve national guidelines on screening and preventive treatment against LTBI for residents and non-residents.

YIA-HSR-01

The Economic Burden of Depression and Subsyndromal Depression among Older Adults — Results from the Well-Being of the Singapore Elderly Study

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Background & Hypothesis:
There is currently limited evidence of the economic burden of depression among older adults from Asian populations. The present study aimed to estimate the economic burden of depression and subsyndromal depression among older adults in Singapore.

Methods:
The Well-being of the Singapore Elderly study was a comprehensive single phase, cross-sectional survey. Depression and subsyndromal depression were established using the Stage 1 Geriatric Mental State-Automated Geriatric Examination for Computer Assisted Taxonomy (AGECAT). Healthcare utilisation for direct and indirect medical care, and intermediate and long-term care was estimated using an adapted version of the Client Service Receipt Inventory. Social care costs for care provided by caregivers, family or friends in terms of activities of daily living (ADL) and instrumental ADL, unpaid and paid care were estimated using the human capital approach.

Results:
Using weighted prevalence of depression (3.7%) and subsyndromal depression (13.4%), the economic burden of depression and subsyndromal depression to society was estimated to be SG$190 million and SG$448 million per year. At an individual level, the total cost per person attributed to depression and subsyndromal depression was estimated to be SG$9070 and SG$5971 per year, respectively. The main driver of the societal costs of depression was associated with social care (65.5%) which was mainly represented by unpaid care (76.9%).

Discussion & Conclusion:
Depression and subsyndromal depression in older adults are linked to significant economic burden for society as well as for individuals, underscoring the need to enhance prevention and intervention efforts that would improve not only depressive symptoms but also individual functioning.

YIA-HSR-02

Unawareness of Memory Impairment, Depression and Dementia in Older Adults with Memory Impairment in Singapore

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Background & Hypothesis:
Unawareness of memory impairment, depression and dementia are often reported to co-occur in older adults. Clinical implications include delayed help-seeking and increased risk of physical harm. Previous research has produced mixed findings on the relationships between unawareness of memory impairment, depression and dementia. This study thus sought to examine the relationship between unawareness of memory impairment, depression and dementia among older adults with memory impairment in Singapore.

Methods:
A total of 751 older adults with memory impairment in Singapore were assessed for depression and dementia. Participants' subjective memory loss was determined based on a self-appraised question on memory while their objective memory loss was calculated based on their performance on 3 cognitive tasks. A binary variable was created to measure unawareness based on the contrast between subjective and objective memory loss.

Results:
A high prevalence of unawareness (80.8%) was observed among older adults with memory impairment. Multivariate logistic regression analyses after controlling for chronic physical conditions and demographic variables revealed that older adults without depression were more likely (OR: 5.0) to be unaware than those with depression. Unawareness was also related with dementia severity where older adults with questionable (OR: 0.3) and mild dementia (OR: 0.4) were less likely to be unaware than someone without dementia.

Discussion & Conclusion:
Unawareness of memory impairment was common among older adults with memory impairment, and associated with depression and dementia severity. Clinicians should pay attention to changes in awareness of memory impairment to ensure that appropriate care is provided to manage depression and dementia.

YIA-HSR-03

Sociodemographic Correlates of Quality of Life in First Episode Psychosis Patients

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Background & Hypothesis:
Mental illnesses have been found to affect quality of life (QOL) in patients. This study determines the QOL among first episode psychosis (FEP) patients and explores its association with sociodemographic factors.

Methods:
A total of 222 consecutive FEP patients without current history of substance abuse were recruited within 3 months of admission into the Early Psychosis Intervention Programme (EPIP) at the Institute of Mental Health. QOL was measured using the WHOQOL-BREF, consisting of 4 domains, namely physical health, psychological, social relationship, and environment. Sociodemographic data was also collected.

Results:
The sample comprised an equal number of males and females with a mean age of 25.8 years. Mean scores (ranging from 4 to 20) for the 4 WHOQOL-BREF domains were 13.8 (physical health), 12.2 (psychological), 12.8 (social relationship) and 13.2 (environment). Psychological domain was positively associated with age ($\beta = 0.10$, $P = 0.04$) and inversely associated with unemployment ($\beta = -1.60$, $P = 0.003$). Social relationship was positively associated with female gender ($\beta = 1.09$, $P = 0.01$) and inversely associated with unemployment ($\beta = -1.35$, $P = 0.009$), secondary ($\beta = -2.68$, $P = 0.02$), 'O'/'N' level ($\beta = -1.49$, $P = 0.03$) and 'A' level education ($\beta = -2.13$, $P = 0.02$). Environment domain was positively associated with being a student ($\beta = 1.17$, $P = 0.03$) whilst inversely associated with unemployment ($\beta = -1.14$, $P = 0.01$) and secondary education ($\beta = -2.72$, $P = 0.005$).

Discussion & Conclusion:
Unemployment was found to be negatively associated with the psychological, social relationship and environment domains of QOL. This reflects that efforts aimed to provide employment opportunities for patients need to be supported. Employment provides financial independence and gives patients a sense of purpose as contributing members of society, which would in turn help to improve their QOL.

BP-AH-01

The Role of Dietitian in Establishing a Nutrition Care Model within a Long-Term Care Facility

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Background & Hypothesis:
Malnutrition ranges from 23 to 85% within nursing homes and is significantly associated with infection risks and hospital readmissions. Establishing nutrition care models and dietary interventions is imperative within long-term care facilities. This project highlights the importance of implementing a nutrition care model involving a dietitian to improve health outcomes in a long-term care facility.

Methods:
Dietetic services at a nursing home commenced since June 2014. Nutrition interventions included introduction of nutrition care processes, monitoring weight loss, nurses' training, and foodservice department collaborations. Residents' weight records, hospital readmission data and nutrition interventions were collected from January 2014 to December 2015. Only underweight or within-ideal body weight range residents were included to determine weight changes trends.

Results:
A total of 122 residents' (in 2014) and 233 residents' (in 2015) records were audited. After 6 months of nutrition interventions (from June to December 2014), residents who had gained weight increased from 31% to 65% and those with significant weight loss (defined by more than 5% within 3 to 6 months) reduced from 17% to 8%. Residents with weight loss reduced from 56% in 2014 to 45% in 2015. Those who gained weight or experienced weight maintenance (within 1%) increased from 43% (in 2014) to 55% (in 2015). In 2015, 40% of residents with weight loss experienced at least one hospital readmission; 48% of hospital readmissions were attributed to falls or infections.

Discussion & Conclusion:
Establishing nutrition care models in a long-term care facility can potentially prevent residents from malnutrition which may be associated with adverse outcomes.

BP-AH-02

Evaluation of Modified Heparin-induced Platelet Activation Assay (HIPA) and Correlation against PF4-ELISA Method from Stago at Tan Tock Seng Hospital, Singapore

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Background & Hypothesis:
Type II Heparin-induced thrombocytopaenia (HIT) is a life threatening prothrombotic disorder caused by antibodies directed against complexes of platelet factor 4 (PF4) and heparin. Failure to diagnose HIT increases the risk of thrombosis, haemorrhage or death. Diagnostic tests for HIT consist of immunoassays e.g. ELISA and functional assays e.g. heparin-induced platelet aggregation assay (HIPA). We evaluated the concordance between the above laboratory tests.

Methods:
Twenty-one donors met the prerequisite criteria to establish a pool of platelet donors for the HIPA assay. HIPA and PF4-ELISA tests were performed on 18 samples. Results were correlated to evaluate concordance.

Results:
Among the 18 patients clinically suspected to have HIT, 8 were tested positive for HIPA, and 10 were tested negative. For PF4-ELISA, 11 were tested positive and 7 were tested negative. The resulted correlation between the two methodologies is 83.3%. Among the 3 patients who were positive for PF4-ELISA but negative for HIT, 2 were weakly positive by PF4-ELISA and 1 was subsequently assessed clinically not to have HIT.

Discussion & Conclusion:
Preliminary analysis shows that HIPA test may be as sensitive and perhaps more specific than the ELISA in the diagnosis of HIT. Further correlation with ELISA will be done to consolidate this preliminary impression. The usefulness of HIPA test is likely to be its responsiveness and possible quicker turn-around time compared to the ELISA, which is done in a batch once every week in other institutions.

BP-AH-03

Why is Your ICU Patient Still in Bed? Barriers to Optimal Mobilisation in the ICU

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Background & Hypothesis:
Prolonged bed rest results in functional decline, increased hospital length of stay and loss of independence in the community. Evidence has shown that optimal levels of mobilisation in the surgical intensive care unit (SICU) improves functional outcomes and reduce SICU stay. The aim of this study is to describe the level of optimal mobilisation in the SICU and identify potential barriers to mobilisation.

Methods:
Subjects were patients in the SICU who met eligibility criteria (e.g. no surgical contraindications and stable vital signs). Optimal mobilisation was defined as having achieved at least 3 out of 5 functional mobility milestones (e.g. sit out of bed) within a day. An expert panel consisting of a multidisciplinary team (e.g. intensivists, doctors, physiotherapists and nurses) was formed to identify barriers. Thematic analysis was conducted using an affinity diagram; common barriers were further identified through a run chart and a Pareto chart via a multivoting process.

Results:
Within a 3-month period, data was collected on the number of patients who received optimal mobilisation per day; out of the 389 cases, only 39% achieved optimal mobilisation. Twenty-one barriers were identified; the top 3 barriers were: mobility not consistently prescribed by the medical team (37.8%), SICU staff unsure of patients' readiness to be mobilised (24.4%), and a lack of knowledge on the benefits of mobilising critically-ill patients amongst staff (11.1%).

Discussion & Conclusion:
Patients admitted to the SICU were undermobilised. Through identifying key barriers, healthcare professionals can begin to address issues preventing mobilisation in the critically-ill, thereby improving patient care and outcomes in the SICU.

BP-BSTR-01

Endothelial Cell Apoptosis in Haptoglobin 2-2 Genotype and Non-Haptoglobin 2-2 Genotype Diabetes Patients

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Background & Hypothesis:
The haptoglobin 2-2 *(Hp2-2)* genotype is associated with lower haptoglobin (Hp) concentrations and atherosclerosis in diabetes. Endothelial cell (EC) apoptosis contributes significantly to atherosclerosis. We studied EC-apoptosis in diabetes patients with the *Hp2-2* genotype and non-*Hp2-2* genotype and the associations with metabolic variables.

Methods:
We pooled plasma from patients with *Hp2-2* (n = 10) and non-*Hp2-2* genotype (n = 10) and quantified EC-apoptosis using a haemodynamic lab-on-chip system. Then we conducted similar experiments on individual plasma samples of diabetes patients with *Hp2-2* (n = 20) and non-*Hp2-2* (n = 20). Hp-beta concentrations were measured by Western blot assays. We looked for association with demographics, metabolic variables, inflammation (hsCRP), and oxidative stress index (OSI).

Results:
In the pooled plasma, EC-apoptosis was higher in the *Hp2-2* group (*Hp2-2*: 23.18%/non-*Hp2-2*: 15.32%). Individual samples: univariate analysis showed that EC-apoptosis correlated with Hp-beta concentrations (P <0.001) and total Hp concentrations only. After multivariate analysis, only Hp-beta concentrations remained significant (P <0.001). The correlation of Hp-beta concentrations to EC-apoptosis rates was significant in the *Hp2-2* group (*Hp 2-2*: R^2 = 0.6764/non-*Hp2-2*: R^2 = 0.4652).

Discussion & Conclusion:
These results show that the *Hp2-2* genotype is associated with higher EC-apoptosis in diabetes patients and that Hp-beta may play a major role in this group. This suggests possible distinct pathophysiological mechanisms for EC-apoptosis in diabetes patients with *Hp2-2* genotype and may provide an opportunity for a targeted intervention.

BP-BSTR-02

AKAP9 Regulates Centrosomal and Non-Centrosomal Microtubule Nucleation in Migrating T-Cells

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Background & Hypothesis:
Microtubule networks are known to be anchored to the centrosome, called the microtubule organising centre. However, the mechanisms regulating both centrosomal and non-centrosomal nucleation of microtubules in immune cells remain largely unclear. This study aimed to uncover microtubule nucleation and associated molecular machinery in migrating T-cells, which is crucial for immune surveillance and functioning.

Methods:
We performed microtubule regrowth assays using our well-characterised integrin LFA-1-mediated human T-cell migration model systems. Cellular and molecular responses were determined and validated by high content analysis, 3D-structured-illuminated super-resolution (3D-SIM) and confocal microscopy, GapmeR-mediated gene silencing, co-immunoprecipitation and Western immunoblotting.

Results:
Using 3D-SIM, we detected microtubule arrays emanating from both centrosome and non-centrosomal regions in migrating T-cells. In the centrosomal regions of motile T-cells, we found A-kinase anchor protein 9 (AKAP9) co-localising with γ-tubulin and pericentrin. The expression of AKAP9, a 450kD protein, was predominant in activated primary T-cells in comparison to naïve CD4+ and CD8+ T-cells or other immune cell types i.e. monocytes and platelets. Antisense GapmeR-mediated depletion of AKAP9 (>90% knockdown) in T-cells caused Golgi fragmentation and interfered with tubulin post-translation tyrosination and acetylation, which are critical for microtubule dynamics and stability. Interestingly, microtubule nucleation at the centrosome and non-centrosomal regions were disrupted in AKAP9-depleted T-cells. Moreover, AKAP9 knockdown significantly inhibited LFA-1-mediated T-cell migration and transwell chemotaxis towards the chemokine SDF-1α.

Discussion & Conclusion:
The scaffolding protein AKAP9 regulates microtubule nucleation at both centrosome and non-centrosomal regions in migrating T-cells. Tunable targeting of AKAP9 could provide a novel approach for modulating T-cell trafficking in chronic inflammatory conditions.

BP-BSTR-03

Regulation of T-Cell Migration by MACF1: A Potential New Target for Immunomodulation

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Background & Hypothesis:
T-cell recruitment to tissue sites of inflammation is essential for an adaptive immune response. This process is critically dependent on the integrin LFA-1-mediated adhesions and cytoskeletal rearrangements facilitated by multiple molecular cross-talks. Here, we aimed to investigate an involvement of microtubule-actin cross-linking factor 1 (MACF1) 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. Standard molecular and imaging techniques including siRNA-mediated gene-silencing, immunoprecipation, Western-immunoblotting, confocal microscopy and high content analysis were implemented.

Results:
Using Western-immunoblotting, we demonstrate that human T-cells express substantial amount of MACF1, which is a giant ~620 kDa protein. This spectraplakin family protein shows distinct localisation in the leading edge and uropod in motile T-cells, suggesting MACF1's involvement in dynamic cell adhesion and detachment. MACF1 partially co-localises with microtubule networks and is required for the coordination of cytoskeletal remodelling in migrating T-cells. We further demonstrate that MACF1 interacts with a serine/threonine kinase GSK3β, which may be critical for MACF1's phosphorylation and function in T-cell migration. Specific depletion of MACF1 (>70% knockdown by siRNA) significantly inhibits the ability of T-cells to form LFA-1-stimulated migratory phenotypes and transmigrate towards the chemokine SDF1α.

Discussion & Conclusion:
We, for the first time, reveal a role of MACF1 and associated mechanism in T-cell migration. Tunable modulation of MACF1 in T-cells using approaches such as RNA interference or blocking peptides could provide a new strategy for modulating local inflammatory responses.

BP-CR-01

Frailty as a Predictor for Poorer Outcomes among Older Adults Admitted to a Specialised Delirium Unit

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Background & Hypothesis:
Delirium recovery may be incomplete, with residual subsyndromal delirium (RSSD) observed despite resolution of the full delirium episode. This study aimed to examine the impact of baseline frailty on short term outcomes of delirium duration, RSSD and functional outcomes at discharge.

Methods:
We recruited 234 individuals (mean age 84.1 ± 7.4) admitted to a specialised delirium unit, the Geriatric Monitoring Unit (GMU) between December 2010 and August 2012. A 20-item frailty index (FI) was derived following a comprehensive geriatric assessment. Frailty was defined by FI $\geq$0.25. Data collected included demographics, comorbidities, Delirium Rating Scale-98 (DRS-R98) and illness severity. Uni- and multivariate analyses were performed on outcomes of delirium duration, RSSD (defined by DRS-R98 severity score $\geq$13 at discharge) and functional recovery [modified Barthel Index (MBI)].

Results:
A total of 159 (67.9%) subjects were frail. Frail individuals were significantly older (85.3 ± 7.4 vs 81.6 ± 6.6, P <0.001), had higher delirium severity on admission, but similar illness severity (P = 0.18). Delirium duration was significantly longer in the frail group (median (IQR): 6 (4-8) versus 4 (3-7) days, P = 0.007). Frail individuals had greater risk of RSSD in multiple logistic regression adjusted for age, gender, pre-existing dementia, illness and delirium severity (OR 3.48, 95% CI 1.83-6.64, P <0.001). Frailty was independently associated with poorer functional recovery (rate of change in MBI, β: -1.17, 95% CI -1.82 – -0.52, P <0.001).

Discussion & Conclusion:
Frail individuals with delirium were at higher risk of adverse outcomes. These findings support the utility of baseline frailty assessments, with strategies for frailty intervention in delirious older adults.

BP-CR-02

Reducing Acute Health Care Utilisation Following Exacerbation with Early Review at a Multidisciplinary Asthma Clinic

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Background & Hypothesis:
Hospitalisations and emergency department (ED) visits are risk factors for asthma death. An early follow-up within 2 weeks after exacerbation by a multidisciplinary asthma specialist outpatient clinic (SOC) with a multidimensional focus may reduce these risks. We aimed to evaluate the outcome of patients attending an asthma SOC within 2 weeks after exacerbation.

Methods:
All adult patients attending the asthma SOC from 2013-2014 were studied. The asthma SOC comprises a multidisciplinary team of doctors, specialist asthma nurses and a rightsiting officer. It followed a structured but multidimensional approach: assessment, treatment, smoking cessation, asthma education, counselling, inhalers technique improvement, and rightsiting to primary care. All patients were seen within 2 weeks after attending the ED. We analysed demographic, asthma-related ED visits and hospitalisations 1 year before and after attending the asthma SOC.

Results:
A total of 438 patients with a median (IQR) age of 43 (26-60) years were studied. Asthma-related ED visits and hospitalisations were significantly reduced after attending the asthma SOC (1.25/patient vs 0.49/patient, P <0.0001; 0.22/patient vs 0.11/patient, P <0.0001 respectively). On subgroup analysis, asthma-related ED visits were reduced in all age groups and hospital admissions were reduced in patients above 50 years (P <0.0001). Increased hospitalisations were associated with ≥3 comorbidities. Female patients had less asthma-related hospitalisations (P <0.0001).

Discussion & Conclusion:
An early review after exacerbation by a multidisciplinary asthma SOC with a holistic approach helps to reduce asthma-related ED visits and hospitalisations.

BP-CR-03

Comparison of Inpatient Opiate Detoxification Retention Rates between Lofexidine and Diazepam in Singapore

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Background & Hypothesis:
Lofexidine study in National Addictions Management Service (NAMS) was the first clinical trial worldwide to compare the effectiveness of lofexidine and diazepam in the inpatient management of opioid withdrawal. The aim of this study was to demonstrate a more effective and non-addictive alternative to the currently used pharmacological treatment (diazepam) for opiate detoxification in Singapore. The intention of the abstract is to present the findings on retention rate between the 2 treatment arms.

Methods:
The trial adopted a randomised, parallel-group, double-blind and double-dummy approach. Subjects received either lofexidine or diazepam for up to 10 days, followed by 4 days of psychosocial intervention in the NAMS ward.

Results:
Subjects on lofexidine were more likely to stay in the study as compared to those on diazepam (i.e. relative risk >1), especially from Day 7 to 13. The difference was most apparent on Day 10 (RR 1.67 [1.00, 2.79]), which was the last medication day, with 26/55 (47%) and 15/53 (28%) of lofexidine and diazepam subjects respectively remaining in the study. On Day 4, when withdrawal is usually at its peak, the proportion of self-discharged subjects within the diazepam arm (11/53, 21%) was almost double that of the lofexidine arm (6/55, 11%). Though these findings fell short of statistical significance, they are of clinical importance.

Discussion & Conclusion:
More lofexidine subjects than diazepam subjects stayed in treatment and completed the detoxification. This is clinically significant because longer periods of stay will afford patients more opportunities to learn essential psychosocial coping skills for prolonged abstinence.

BP-HPE-01

Life of a Clinician-Educator – A Toddler Changing a Baby's Diapers?

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Background & Hypothesis:
There are increasing demands on clinicians to concurrently play educator roles in clinical setting. Yet, little is known about how they are managing both these equally important roles. Researchers have argued that metaphors can reveal the deeper intents of its users (Deignan, 2005). We seek greater understanding of the clinician-educators' perceptions on handling both roles through their use of metaphors.

Methods:
Thirty-nine occupational therapists and physiotherapist educators with varying years of clinical experience were recruited from 2 tertiary hospitals. Participants were asked to use a phrase/image/metaphor to describe their roles as clinician-educators. Data from 9 focus groups and 3 individual interviews were audio-recorded and transcribed verbatim. Thematic analysis was used.

Results:
The metaphors can be categorised into 3 themes: nurturer, frazzled professional, and multitasker. The participants saw their job requiring multitasking skills in managing both learners' and patients' needs. Younger educators with less than 5 years of teaching experience were more likely to describe their struggles in juggling their clinician and educator roles. More experienced educators viewed themselves as nurturing patients and learners. Most of the clinicians deployed metaphors that revealed the stress they faced in handling dual roles.

Discussion & Conclusion:
The metaphors provided an insight into the lives of clinician-educators. Combined clinician and educator roles were perceived as stressful work, especially for occupational therapist and physiotherapist junior educators. Adequate training and organisational support are essential to support our clinician-educators in both roles.

BP-HPE-02

Preliminary Data from Studying Moral Distress amongst Trainees in a Residency Programme

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Background & Hypothesis:
Moral distress is the mental and emotional pain from participating in perceived moral wrongdoings. Residents are particularly vulnerable owing to relative inexperience and position in the professional hierarchy.

Methods:
Residents and senior residents were surveyed via anonymous, online questionnaires. Subjects scored frequency and intensity of distress using the Moral Distress Scale-Revised (MDS-R). Perceived efficacy in coping with moral distress was measured using the General Self Efficacy (GSE) scale. Information including sociodemographics, year of residency, academic qualifications and duration of clinical practice were collected. Subjects with MDS-R within the top and bottom quartiles were compared, to identify predisposing factors.

Results:
Of 140 respondents, 54.3% were female, and 35% were senior residents. Mean MDS-R scores ($\pm$ SD) was low at 81.7 $\pm$ 44.9. However, >20% of subjects experienced severe distress in 13/22 scenarios of the MDS-R. Of these, >20% of subjects encountered 8 scenarios sometimes too very frequently. They pertain to: 1) futile interventions; 2) collusion; 3) inappropriate treatment for fear of litigations; 4) poor communication, and 5) inadequate healthcare resources. Comparing the highest and lowest quartiles of MDS-R scores, age 26-30 is significantly associated with greater distress (OR 4.36, *P* <0.05). There were no differences by demographics, religion, duration of practice, stage of residency and previous ethical training. Mean GSE scores (28.74 $\pm$ 4.08 vs 28.75 $\pm$ 3.43) were near-identical.

Discussion & Conclusion:
A subpopulation of trainee experiences exceedingly higher moral distress across an array of clinical encounters, but fails to perceive a deficit in coping. Further qualitative interviews will explore predictors of distress and deficiencies in current bioethics curriculum.

BP-HPE-03

Challenges in Communication among Residents: What Works?

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Background & Hypothesis:
Good physician communication skills are essential for accurate and clear peer-to-peer, physician-to-physician and physician-to-lay-public communications, which must be learned and practised. Our study aimed to explore the challenges in various aspects of communication skills that residents face in their daily work and the residents' perceptions of how communications can be effectively taught and learnt.

Methods:
Eight focus groups were conducted with 57 residents from 10 various specialties in a tertiary hospital from June to August 2015. The discussions were audio-recorded, transcribed and analysed thematically.

Results:
Challenges leading to difficult communication included: 1) lack of mutual understanding among interprofessional teams, 2) structural constraints such as policy/system issues which residents have no control over, 3) multiple competing needs which decrease active listening skills, and 4) patients/families factors, for e.g., unrealistic expectations, different language/cultural background. Topics which residents found difficulty in included end-of-life discussions, managing difficult interactions, medico-legal issues and breaking bad news. Residents wanted communication courses to be introduced in their preclinical training and early part of their residency traineeship. While residents appreciated formal teaching through communication courses, they felt that these courses did not sufficiently equip them to handle communication challenges faced in the workplace. They valued work-based/workplace learning via emulating good role models, receiving mentoring at work, and learning through practicum.

Discussion & Conclusion:
Communication courses should be introduced early in their training and designed to convey the realism of workplace demands. The findings highlighted the importance of work-based/workplace learning, the value of mentors, role models and interprofessional education.

BP-HSR-01

Preliminary Evaluation of ValuedCare Hip Fracture Programme in Changi General Hospital (CGH)

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Background & Hypothesis:
This study evaluated the effectiveness of ValuedCare programme, a protocolised management of fragile hip fracture in the elderly aiming to improve patient's journey and outcomes. Twenty-three best practices elements (BPE) were implemented in each stage of care from A & E to postdischarge review.

Methods:
This non-randomised historical-control study compared 329 consecutive patients (≥65 years old) admitted with a single hip fracture who had underwent surgery in CGH from December 2014 to November 2015, against a control group (n = 351) from January to December 2013 with 1-year follow-up after surgery.

Results:
Demographic profiles of both groups were comparable, with mean age of 81 years and female preponderance. Comorbidities were significantly higher in the ValuedCare cohort. Patients who underwent surgery within 48 hours from time of decision to admit increased from 18.8% to 48% in ValuedCare (P <0.001). The programme achieved 25% reduction in average length of inpatient stay (LOS) with median LOS of 10 days (P <0.001), significantly reduced postoperative complications such as delirium (10% vs 4%), pneumonia (13% vs 4%), urinary tract infections(26% vs 5%) and pressure sores (11% vs 0.3%). No significant differences were observed in readmission within 30 and 180 days, mortality at 30-days and 1-year. Under ValuedCare, 30% of patients regained their prefracture mobility (New Mobility Score) and 50% regained prefracture functional dependency (Modified Barthel Index) at 6-months follow-up. Most patients (70%) regained prefracture health-related quality of life at 6-months after surgery.

Discussion & Conclusion:
The preliminary findings showed significant improvement in time to surgery, average LOS and complications. Further evaluation is needed to identify factors contributing to functional outcomes after hip fracture.

BP-HSR-02

Evaluation of a Multifaceted Fall Prevention Programme in Community-Dwelling Elderly in Singapore

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Background & Hypothesis:
Fall is the number one cause of trauma in the elderly with significant morbidity and healthcare utilisation. Multifaceted fall intervention delivers a fixed set of intervention to all participants as compared to mulitfactorial intervention which addresses individual risk factors. Our study evaluated a multifaceted fall intervention and medical screening programme in a group of community-dwelling elderly in Singapore.

Methods:
"Stepping Out into Active Life" is a 52-week programme. Participants received medical screening for fall risk, exercise, education and home safety assessment. Participants were followed up for 1 year with evaluation at 3, 6 and 12 months and monthly calls for falls, ED visits and hospitalisations. The evaluation utilised a prospective cohort design with waitlist control. The control group received general health education and was evaluated at baseline and 12 months before they were enrolled into the intervention group.

Results:
There were 1639 participants in the intervention group and 286 in the control group. Baseline fall rates were 23% and 21% respectively ($P = 0.54$). There was significant improvement in physical performance in the intervention group compared to the controls in balance: BBS change score = 1.18 vs 0.32, endurance: 6-minute walk = 30.09 m vs 8.23 m and strength: chair rise = 1.28 s vs 0.77 s. Multivariate analysis showed that the intervention group had fewer falls (OR = 0.63, 95% CI 0.48, 0.84) and fewer ED visits (OR = 0.47, 95% CI 0.24, 0.91) compared to controls.

Discussion & Conclusion:
The results of our evaluation showed that multifaceted fall prevention programme can reduce falls in unselected community-dwelling elderly.

BP-HSR-03

The Impact of Excess Weight and Hypertension on Diabetes Development – Assessing Intervention Priorities Using Population Attributable Risks

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Background & Hypothesis:
Diabetes, obesity and hypertension coexist frequently. Little is known about the impact of obesity and hypertension on diabetes development. This study aims to compare the reduction in incident diabetes upon elimination of excess weight and hypertension.

Methods:
A retrospective cohort study was conducted using NHG patient registry comprising 3390 patients, aged 40+ years, from NHGP who had glucose, blood pressure and body mass index measurements in 2011. They were without diabetes and vascular diseases. We estimated the relative risk of developing diabetes in 4 years using a Poisson model, and calculated individual and combined population attributable risk (PAR) of excess weight and hypertension.

Results:
About 13.6% developed diabetes during follow-up. Adjusted individual PARs were 26.8% for excess weight and 34.0% for hypertension. More incident diabetes among the Chinese was attributed to hypertension (PAR: 36.0%) than excess weight (PAR: 24.2%). However, the impact of excess weight was larger than hypertension among the Malays (PAR: 71.7% vs 31.0%). Elderly aged 65+ had the largest PAR for hypertension (48.1%) and smallest for excess weight (18.2%) compared with younger groups. About 51.7% of incident diabetes could be prevented upon elimination of both risk factors, yielding the largest reduction of incident diabetes among Malays, followed by Chinese and Indians (combined PAR: 80.5% vs 51.5% vs 32.0%).

Discussion & Conclusion:
Achieving optimal weight yields a larger impact over hypertension control among the Malays, whilst the reverse is true for the Chinese and the elderly. The PAR could be used to inform risk appraisals and prioritise interventions for policymakers.

BP-NR-01

Predictors of Personal Mastery in Caregivers of Hospitalised Older Persons

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Background & Hypothesis:
Caring for older persons is often straining. The caregivers' sense of personal mastery could mediate this strain. Mastery may have a bi-directional relationship with burden. Despite the importance of mastery, no study has examined this construct locally. This study aimed to examine predictors of mastery in family caregivers of hospitalised older persons. Hypothesis: Caregiving-related factors could predict caregiver mastery.

Methods:
This was a cross-sectional study (n = 150). We consecutively surveyed family caregivers of older persons aged ≥65 who were hospitalised in a tertiary hospital. Caregiver mastery, burden and distress from neuropsychiatric symptoms were assessed with Pearlin Mastery, Zarit Burden Interview (ZBI), and Neuropsychiatric Inventory-Questionnaire (NPIQ) scales, respectively. Descriptive statistics, correlations between mastery and characteristics of caregiver and care-recipient were examined. Significant variables from univariate analyses were included in a multiple regression model for predicting mastery.

Results:
Pearlin Mastery scale has good internal consistency (Cronbach's alpha 0.76). Higher mastery correlated with lower ZBI and NPIQ scores. Univariate analyses revealed 4 significant variables: ZBI, NPIQ, years of caregiving (<5, 5 to <10 and ≥10 years), and presence/absence of caregiving help. The four-variable regression model explained 46% of variance in mastery (F = 22.46, P <0.001). Significant variables were: ZBI (beta = -0.51, P <0.001), NPIQ (beta = 0.16, P = 0.027) and ≥10 years of caregiving (beta = 0.23, P = 0.001).

Discussion & Conclusion:
This novel local study on caregiver mastery showed that caregiver burden, distress from neuropsychiatric symptoms and ≥10 years of caregiving could predict mastery. The findings could assist in identifying caregivers with low mastery so that appropriate interventions could be targeted to assist them to cope better.

BP-NR-02

Factors Associated with Caregiver Burden among Family Caregivers of Elderly Cancer Patients: A Systematic Review

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Background & Hypothesis:
Caring for elderly cancer patients may cause multidimensional burden on family caregivers. Recognition of factors associated with caregiver burden among family caregivers of elderly cancer patients is important for providing proactive support to caregivers at risk.

Methods:
A systematic search of 7 electronic databases was conducted from database inception to October 2014. The identified studies were screened and the full texts were further assessed. The quality of included studies was assessed using a modified checklist and relevant data was extracted using a predeveloped data extraction form. Best-evidence synthesis model was employed for data synthesis.

Results:
The search yielded a total of 3339 studies; 2181 titles and abstracts were screened and 7 studies involving 1233 family caregivers were included after full assessment of 116 studies. Moderate evidence supported that younger caregivers, solid tumours and assistance with patient's activities of daily living were significantly associated with high caregiver burden. Eighteen factors were supported by limited evidence and 1 was a conflicting factor.

Discussion & Conclusion:
The scientific literature to date proved that caregiver burden was commonly experienced by family caregivers of elderly cancer patients. The evidence indicated that family caregivers who were at a younger age, caring for solid tumour patients, and providing assistance with patient's activities of daily living reported high caregiver burden.

BP-NR-03

The Invisible Carers of our Seniors – A Qualitative Study of the Factors Influencing Caregiving by Foreign Domestic Workers in a Developed Country

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Background & Hypothesis:
In Singapore, foreign domestic workers (FDWs) are increasing. Yet, while studies report family caregivers of elders face higher risks of poor health, few studies have been done on FDW caregivers, who may be doubly vulnerable, faced with multiple stresses caring for a frail elder. This qualitative study aims to explore the various factors influencing the quality of caregiving by FDWs to our seniors.

Methods:
The qualitative component comprised semi-structured, in-depth key informant interviews of 20 FDW caregivers from Khoo Teck Puat Hospital, who were selected through snowball sampling. Interviews were transcribed and analysed inductively with thematic analysis.

Results:
Foreign domestic workers interviewed were from Indonesia, Philippines and Myanmar, who were looking after a frail elder in Singapore. Almost half were looking after elders with dementia, and reported common increased challenges such as difficulty sleeping, verbal abuse, lack of privacy, and difficult behaviour. Positive factors enhancing resilience included empathetic employers who expressed appreciation, a positive relationship with the elder, respite such as regular off-days or time to rest in the daytime, and an additional FDW to assist with other demands. Discouragement due to poor relationship with their employers were strong predictors of stress, manifesting as fatigue. Most interviewees expressed the desire to learn more caregiving skills.

Discussion & Conclusion:
FDW caregivers face great demands in caring for elders but face barriers in accessing training and coping skills. Ways to support them include opportunistic clinic visits or the time spent in wards to assess their mental well-being and include them in support groups.

SGPCR-P-01

Comparison between Acarbose and Sitagliptin as a Third-line Treatment for Patients with Poorly Controlled Diabetes in National Healthcare Group Polyclinics in Singapore

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Background & Hypothesis:
Poorly controlled diabetes mellitus results in significant mortality and morbidity. Acarbose and sitagliptin are two commonly used third-line oral hypoglycaemic agents (OHGA) available in the National Healthcare Group Polyclinics (NHGP) for poorly controlled diabetic patients who refuse insulin. The primary aim of this study is to compare acarbose and sitagliptin as a third-line agent, in addition to metformin and a sulphonylurea, in reducing glycated haemoglobin (HbA1c) after 12 months. The secondary aim is to compare the weight change in these 2 groups after 12 months.

Methods:
A retrospective cohort study was conducted on patients with poorly controlled type 2 diabetes mellitus (T2DM) in the 9 NHGP polyclinics from 1 January 2012 to 31 March 2015. A total of 131 patients who were newly initiated on acarbose as a third-line therapy were selected and matched with 131 similar patients who were newly initiated on sitagliptin during this time period.

Results:
Both acarbose and sitagliptin groups showed a reduction in Hba1c by 0.8% (IQR 1.9 for acarbose, 1.5 for sitagliptin). Patients were found to have a median weight change of -0.5 kg (IQR: 3.0) and -0.3 kg (IQR: 2.3) for acarbose and sitagliptin respectively. The difference in HbA1c reduction and weight change between the 2 groups was not statistically significant.

Discussion & Conclusion:
Both acarbose and sitagliptin were found to be equally efficacious in improving glycaemic control in patients with poorly controlled T2DM. Hence, either drug may be used as a third-line agent for patients with poorly controlled T2DM after considering patient's preference and individual clinical characteristics.

SGPCR-P-02

Differences in Health Concerns among Patients with Well Controlled and Poorly Controlled Type II Diabetes Mellitus

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Background & Hypothesis:
Diabetes education in the polyclinics is standardised across all patient groups. However, individualised diabetes education has shown to be more effective in improving glycaemic control. Our objective was to see if varying levels of glycaemic control was associated with differing health concerns and to identify them.

Methods:
A total of 150 patients with type 2 diabetes mellitus completed a self-administered questionnaire consisting of 40 questions derived from the EMMA tool "My Challenges" (Steno Diabetes Centre, Denmark). Duration of diabetes, latest HbA1c level and demographic data was collected. Patients with a HbA1c of 8.5% or more were defined as diabetics with poor control. The primary outcome was the number of positive responses in the survey form.

Results:
The mean age was 62.2 and 56.3 years in the well controlled group and poorly controlled group respectively (P <0.01). The mean HbA1c level was 6.83% and 9.82% in the well controlled group and poorly controlled group respectively (P <0.001). Patients with poorly controlled diabetes had more positive responses (11.78 vs 8.78, P = 0.01). Patients with poorly controlled diabetes were more likely to feel that medication did not help them with their illness (25.9% vs 8.1%, P = 0.008) and that they thought too much about what they were allowed to eat (48.1% vs 25.2%, P = 0.01). Patients with well controlled diabetes felt that those around them did not understand what having a chronic illness means (35.8% vs 14.8%, P = 0.01).

Discussion & Conclusion:
Varying degrees of glycaemic control is associated with differing health concerns. Patients with poorly controlled diabetes have more concerns, necessitating a systematic approach to individualising diabetes education in the polyclinic.

SGPCR-P-03

Validation of Client Satisfaction Questionnaire (CSQ-8): A Study on Primary Care Mental Health Services in Singapore

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Background & Hypothesis:
Client satisfaction measured by the Client Satisfaction Questionnaire (CSQ-8) is an important indicator of quality that primary care mental health (PCMH) services in polyclinics aim to fulfill. Reliability and validation testing of CSQ-8 have been done in mental health contexts and applied for wide populations. This study investigated whether: 1) CSQ-8 provides useful information about PCMH, 2) CSQ-8 ratings are correlated with clinically significant reductions in patients' ratings of depression (PHQ-9) and anxiety (GAD-7).

Methods:
All 350 patients with symptoms of depression and anxiety seen by clinical psychologists in a PCMH clinic completed the CSQ-8, PHQ-9 and GAD-7 at first contact and discharge. An exploratory principal-components analysis was conducted and internal reliability was assessed. The data was not normally distributed, thus Spearman's rank order correlation coefficient was used to analyse correlations between ratings for CSQ-8, symptomatic change (i.e. difference between pre- and post-treatment) in PHQ-9 and GAD-7, respectively, and presence of clinically significant symptomatic change (i.e., a drop of ≥5 scores) in these symptoms.

Results:
Exploratory principal-components analysis showed all items in CSQ-8 loaded heavily on one factor, with strong inter-item correlations. High internal consistency (Cronbach's alpha = 0.88) was found. Significant correlations ($P < .05$) between client satisfaction and symptomatic change in depression (rs = -0.13) and anxiety (rs = -0.16) were found.

Discussion & Conclusion:
Findings showed that CSQ-8 is a reliable indicator of satisfaction with psychology services in PCMH for a Singaporean context. Symptomatic changes in depression and anxiety showed that CSQ-8 adequately reflects the impact of service quality on improvement in mental health symptoms.

AH-01

GeneXpert – A State of the Art Commercial PCR Assay, Misses a Fifth of Tuberculosis Cases

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Background & Hypothesis:
Tuberculosis rates persist at around 40/100,000 per year in Singapore. Clinical suspicion may be supported by a chest x-ray but laboratory tests remain a cornerstone of diagnosis. Traditional microscopy and culture have severe limitations. Microscopy is insensitive at 30% to 35%, although it is relatively fast with most reports issued within 24 to 36 hours. Culture may take many weeks although some positive reports are issued within 10 days. The main advance in the last decade has been the introduction of nucleic acid tests for the detection of the *Mycobacterium* tuberculosis complex (MTBC). The GeneXpert is the diagnostic assay in use in the clinical diagnostic laboratory at TTSH. We looked at results from 169 cases to estimate the performance of the assay in our hands.

Methods:
A total of 169 respiratory samples were collected between January 2015 and February 2015. The assay was run as per the manufacturer's instructions.

Results:
A total of 101 samples were culture-negative, 68 were culture-positive; 26 of the 68 culture-positive samples were smear-positive and the geneXpert assay detected MTBC in all of them (100%). Forty-two of the 68 culture positive-samples were smear negative and, in contrast, the GeneXpert detected MTBC in only 28 of these 42 samples (66%). This is an overall sensitivity of 54/68 (79%).

Discussion & Conclusion:
Despite the fanfare, nucleic acid tests remain less sensitive compared with culture in the detection of MTBC. This underlines the importance of not using these assays to exclude TB. While these tests continue to disappoint, we still have an opportunity to develop methods to close the gap.

AH-02

Prevalence and Correlates of Traumatic Brain Injury (TBI) in Older Adults of the WiSE Study

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Background & Hypothesis:
Traumatic brain injury (TBI) is a growing problem and the elderly are one of the most susceptible to TBI. The study aimed to determine: 1) the prevalence of TBI among older adults in Singapore, and 2) sociodemographic, lifestyle and clinical correlates of TBI.

Methods:
Data was extracted from the cross-sectional, Well-being of the Singapore Elderly (WiSE) study. The study included 2565 participants (43.5% males) aged 60 and above (mean = 72.75, SD = 9.54). Information on TBI was collected by asking participants if they had ever suffered "a serious head injury in which (they) were knocked out". Sociodemographic and lifestyle factors were collected using participant self-reports and they were verified with the informant report where necessary. Disability was measured using the World Health Organisation-Disability Assessment Schedule II (WHO-DAS II). Data was weighted to ensure that it was representative of the older adult population of Singapore and analysed using logistic regression analysis.

Results:
The prevalence of TBI was found to be at 3.6%. Being male (versus female) and having completed secondary education or lower (versus tertiary education) were found to increase the odds of having TBI. A history of fainting and diabetes were associated with the presence of TBI. Those with TBI were associated with higher disability scores on the WHO-DAS II than those without TBI.

Discussion & Conclusion:
The current study provides information on the prevalence and associated factors of TBI in the older adult population in Singapore. Care providers should provide more attention to the elderly as TBI is associated with comorbid diabetes and greater disability.

AH-03

Leg Length, Skull Circumference and Dementia in a Singapore Older Adult Population

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Background & Hypothesis:
Research has shown that skull circumference and leg length, which are reliable proxy indicators of early life environment, are associated with dementia in older adults. The aims of the present study were thus to examine the sociodemographic correlates of these anthropometric measurements, and to assess the association between dementia with skull circumference and leg length among the older adult population in Singapore.

Methods:
Data was collected from older adults aged 60 years and above who participated in the Well-being of the Singapore Elderly study (WiSE) (n = 2565). Skull circumference and leg length measurements were obtained, and sociodemographic information (age, gender, ethnicity, and education level) was recorded. Dementia diagnosis was made using the 10/66 dementia algorithm. Anthropometric measurements were first stratified into quarters and logistic regression analysis was then used to examine factors associated with skull circumference and leg length. The association between dementia with these anthropometric measurements was also assessed using logistic regression and controlling for sociodemographic factors.

Results:
Sociodemographic correlates of skull circumference and leg length included age, gender, ethnicity, and education level. Shorter leg length quarters were associated with higher odds of a 10/66 dementia, but only at the univariate level (OR: 2.19-3.23). Older adults with skull circumference in the smaller quarters had higher odds of dementia, and this association remained significant after controlling for sociodemographic factors (OR: 2.77-2.85).

Discussion & Conclusion:
Smaller skull circumference is independently associated with dementia among older adults in Singapore. Our findings suggest that risk factors for dementia begin their influence in early life.

AH-04

Comparison of Normal Resolution Electrophoresis and High Resolution Electrophoresis for Myeloma Screening and Follow-up

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Background & Hypothesis:
While high resolution electrophoresis (HRE) is more sensitive than normal resolution electrophoresis (NRE) for monoclonal bands, NRE is required for monoclonal band quantitation, causing additional costs to myeloma screening and follow-up. We determined if NRE combined with immunofixation (IFE) is as sensitive as HRE for monoclonal bands.

Methods:
Patients with M band quantitation requests (performed using NRE) to National University Hospital laboratory were identified between April 2016 to May 2016 and HRE was performed on these patients. The presence of monoclonal bands was confirmed based on IFE results (within 3 months) and clinical diagnosis. Sensitivity and specificity were calculated and statistical analysis was performed using Excel.

Results:
Seventy-nine NRE from 71 patients were compared against HRE. The sensitivity and specificity of NRE were 84% and 100%, respectively, compared to HRE. The sensitivity and specificity of NRE for monoclonal bands were 92% and 88%, and for HRE, they were 95% and 54%, respectively. Between January 2016 to May 2016, there were 722 HRE combined with IFE requests, 522 NRE requests, and 55 HRE, NRE and IFE requests. If NRE was combined with IFE, it would allow M band quantitation in patients with positive IFE in the same setting, saving 55 HRE tests that would cost $40.80; therefore, the savings would amount to $2244 in 5 months. In addition, replacing HRE with NRE will reduce 34% of false-positive results.

Discussion & Conclusion:
NRE has similar sensitivity as HRE and less false-positives, with some cost savings and faster turnaround time, as M band quantitation can be performed from NRE.

AH-05

Amikacin Use in the Hospitalised Elderly – An Audit on Dosing and Therapeutic Drug Monitoring Practices

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Background & Hypothesis:
Amikacin is increasingly given as consolidated doses and therapeutic drug monitoring (TDM) has become an integral part of aminoglycoside therapy to minimise nephrotoxicity. Advanced age is a risk factor for toxicity, yet evaluation of dosing and TDM practices are lacking in the elderly. We aim to determine: 1) the appropriateness of dosing, 2) incidence of acute kidney injury (AKI), and 3) TDM practices in the hospitalised elderly on amikacin.

Methods:
Retrospective audit was conducted in the elderly admitted to the geriatric medicine department in our institute in January 2016. In-house antimicrobial guidelines were used to determine appropriateness of amikacin dosing and TDM practices. AKI was defined as increase in serum creatinine by 26.4 mmol/L. Paired sample t-test was used.

Results:
Forty-one patients were included. Maintenance doses were appropriately adjusted for kidney function according to recommended regimes ($P = 0.64$) but lower loading doses were given compared to the recommended dose of 15 mg/kg (-363 mg, $P < 0.05$). Amikacin did not cause AKI except in 1 patient as mean creatinine clearance post-treatment was significantly higher than pre-treatment value (26 + 3.7 mL/min, $P < 0.05$). Five out of 15 patients on regular amikacin had troughs ordered at inappropriate time which resulted in 3 dose omissions and 4 additional troughs ordered. Reasons for suboptimal TDM were inadequately spaced dosing intervals, not using timing of first dose as reference and not specifying trough time when ordering.

Discussion & Conclusion:
Regular amikacin regimens were appropriately dosed and did not cause AKI in our study population. Suboptimal TDM was observed in 33.3% of patients on monitoring and such findings have important implications on quality improvement to be addressed in future studies.

AH-06

Interesting Cases Observed during Validation of Chromosomal Microarray in Prenatal Diagnosis

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Background & Hypothesis:
Chromosomal microarray analysis is a primary diagnostic tool for the evaluation of developmental delay and structural malformations in children. For prenatal diagnosis, this technology has not been accepted very rapidly for fear of obtaining excessive information. We would like to share our validation experiences in this area by presenting a few cases.

Methods:
Only patients with high risk ultrasound findings were included in this study. DNA from cultured amniotic fluid was run on the Affymetrix CytoScan 750K SNP chip, with karyotyping being done simultaneously.

Results:
Here we report 6 interesting cases with mainly abnormal ultrasound findings where microarray provided additional and helpful information to the patients. Case 1 had a karyotype of 46,XY,del(5)(p13p15.1) but showed deletion of NIPBL known to cause Cornelia De Lange syndrome by microarray. Case 2 had a marker chromosome which was proved to have no genomic content by microarray. Case 3 and 4 showed a chromosomally abnormal karyotype, which was precisely determined by microarray. Case 5 showed a normal karyotype but array showed a 3.5Mb deletion known to cause Ellis-van-Crevald syndrome. Case 6 had an abnormal karyotype but was surprisingly normal by microarray. Details will be presented in a poster.

Discussion & Conclusion:
The microarray testing in prenatal samples of cultured amniotic fluid was very useful to parents in decision-making. As long as genetic counselling is done clearly and clear guidelines are set with regards to whether the parents would like to know incidental findings involving (a) cancer genes e.g. *BRCA* 1 and 2, and (b) infertility.

AH-07

Sleep Behaviours and Sleep Hygiene: An Application of the Theory of Planned Behaviour

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Background & Hypothesis:
Fifteen percent of Singaporean adults report insufficient sleep, averaging 6 hours and 32 minutes sleep per day. This is associated with severe health conditions including cardiovascular disease and psychiatric disorders. Current treatment heavily relies on hypnotic medications. This study examines adherence to an empirically supported, non-pharmacological intervention. Using the Theory of Planned Behaviour (TPB) framework, attitude, subjective norm, and perceived behavioural control are evaluated as predictors of sleep hygiene (i.e. adherence towards behavioural habits that ensure good quality sleep) intentions and practises.

Methods:
A purpose-designed questionnaire measuring insomnia severity and TPB predictors of sleep hygiene is administered to a convenience sample of 100 university students and 100 non-students.

Results:
Descriptive analyses and structural equation modelling are conducted to identify the strength of TPB predictors of intentions and actual practises of sleep hygiene. Based on available research evidence, it is predicted that attitudes, subjective norms and perceived behavioural control will significantly determine intentions to practice sleep hygiene.

Discussion & Conclusion:
Research findings will enable clinicians to understand relevant cognitive processes associated with sleep practises. This helps allied health professionals in the design of appropriate psychoeducational and treatment plans for promoting sleep through strengthening sleep hygiene cues and practises. Public health campaigns will be able to use the findings to raise awareness of motivational factors and non-pharmacologic approaches, potentially lowering consequences of sleep deprivation in Singapore.

AH-08

Structure and Connectivity of the Amygdala in Schizophrenia and Bipolar Disorder: A Systematic Review of Neuroimaging Findings

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Background & Hypothesis:
Abnormalities in the structure and connectivity of the amygdala are reported in many studies across the psychosis spectrum. We aim to integrate and synthesise current neuroimaging findings from 2 severe psychiatric disorders—schizophrenia (SZ) and bipolar disorder (BD).

Methods:
Based on PRISMA guidelines, we systematically searched PubMed (up to April 2016) for comparative MRI studies of SZ, BD with healthy controls (HC). Twenty-two studies of the amgydalar structure directly compared SZ and BD subjects. Out of the 24 resting-state (RsfMRI) studies, only 1 was a comparative study between BD and SZ.

Results:
Differences in amygdala volumes between patients (SZ and BD) and HC were found in 21 studies. Eight studies found evidence of reduced amygdala volume in SZ whereas only 2 studies reported reduced amygdala volume in BD. Conversely, 5 studies found amygdalar enlargement in BD. Additionally, 5 studies reported larger amygdala volumes in BD compared to SZ. Most findings in SZ showed hypoconnectivity between the amygdala, and dorsolateral-prefrontal and ventral-prefrontal cortices. In contrast, studies of BD reported mixed findings of hyper- and hypo-connectivity between the amygdala and ventroprefrontal cortex.

Discussion & Conclusion:
Our review found evidence of shared and divergent amygdala abnormalities in SZ and BD. However, our interpretation of the synthesised findings is limited by the heterogeneity of the patient population examined, methodological differences in the amygdalar segmentation, paucity of comparison studies between patient groups (especially in RsfMRI studies), and the cross-sectional nature of the studies examined, of which future longitudinal studies can address.

AH-09

Longitudinal Monitoring of Plasma miRNA Expression in Metastatic Colorectal Cancer Patients under Oxaliplatin-based Chemotherapy

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Background & Hypothesis:
In Singapore, colorectal cancer (CRC) is one of the most common cancer and is associated with high mortality and morbidity rate. A possible treatment option for metastatic CRC patients is chemotherapy. However, resistance is often developed quickly. MicroRNA (miRNA), a short non-coding RNA, is able to downregulate the translation of messenger RNA (mRNA) which may facilitate cancer development, tumour progression, and possibly chemoresistance. Hence, this study aims to obtain miRNA expression patterns in patients' plasma to identify highly expressed miRNAs that can serve as potential predictive biomarkers for chemoresistance.

Methods:
Peripheral blood plasma samples were taken from 9 metastatic CRC patients at multiple time points over their course of oxaliplatin-based chemotherapy. FTA Elute Micro Card was used to extract and purify miRNAs from PCR-inhibiting substances in the plasma. Using MiRXES miRNA Assay Technology, miRNAs were reverse transcribed into complementary DNA (cDNA) and quantified using Real-Time PCR. A panel of 24 miRNAs were studied.

Results:
MiRNA expression patterns were obtained and correlated with the patient outcomes and the circulating tumour cell (CTC) number. The RECIST criteria was used to determine whether there was regression of the tumour and metastases, or whether the disease was progressive or stable. Comparing the size of the tumour on imaging was the most important factor of RECIST.

Discussion & Conclusion:
Candidate miRNAs identified may potentially serve as predictive biomarkers and/or therapeutics targets but would need to be confirmed in larger cohorts and looked into their mechanism of action.

AH-10

Face-to-Face Interaction and Enhanced Telephonic Case Management in the Emergency Services Promote Better Clinical Outcomes

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Background & Hypothesis:
The Institute of Mental Health (IMH) is a tertiary hospital that faces a high TCU default rate following an Emergency Services (ES) visit. Telephonic case management has been known to increase overall efficiency in the delivery of hospital services. An important factor—relationship building between the case manager (CM) and the patient—has been shown to contribute to higher recovery rates. Relationship building through face-to-face interactions between patient and CM at the ER followed by enhanced telephonic sessions were hypothesised to predict higher TCU compliance over a 6-month period.

Methods:
The retrospective study utilised the Plan-Do-Study-Act (PDSA) methodology to enhance its existing telephonic strategies. This included meeting patients at ES, increasing the number of psychoeducation sessions, 48-hour post-ES phone calls and TCU reminder calls.

Results:
Patients who did not undergo face-to-face intervention or enhanced telephonic management from April 2015 to September 2015 had TCU compliance rate of 68.2% (n = 1695). Patients who had undergone face-to-face intervention and enhanced telephonic management from October 2016 to March 2016 had a TCU compliance rate 77.0% (n = 154). Comparing patients who were managed without enhanced telephonic sessions and did not receive face-to-face CM intervention and those with interventions, there was a 9% increase in TCU compliance rate.

Discussion & Conclusion:
Our findings support our hypothesis and suggest that the use of enhanced telephonic case management and face-to-face interactions with CM improved TCU compliance rate. If more patients had complied with treatment, unnecessary readmissions into the inpatient wards could be prevented.

AH-11

Aftercare Service for Discharged Patients – A Partnership with Community Partners

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Background & Hypothesis:
The impact of a severe mental illness (SMI) on an individual is often far-reaching and lifelong, and non-compliance has a major negative effect on the individual (Harvey, 2011). The consequences of a relapse from a SMI are detrimental to the individual and the community in which the individual resides in (Weimand, Sallstrom and Hall-Lord, 2010). The Institute of Mental Health (IMH) formed a partnership with community partners in 2014 to provide aftercare service for discharged patients in an identified vicinity in Singapore. The anchor of this partnership was a case manager from the hospital. This paper discusses the benefits of this partnership.

Methods:
A total of 20 patients (F = 5, M = 15), predominantly Chinese in ethnicity, were recruited for this project in 2014. These individuals and their community partners were introduced to a dedicated case manager from the hospital. Three sets of data (emergency room visits, admissions and appointment defaults) linked to relapse were collected between 2013 and May 2016.

Results:
Results showed a 38% decrease for appointment defaults, 52% decrease for e-room visits and 25% decrease for admissions between 2013 and 2015. Further reductions of 81% for appointment defaults, 73% for e-room visits and 73% for admissions between 2015 and May 2016 were prominent.

Discussion & Conclusion:
Based on these results, aftercare service with a case manager working in partnership with a community partner promoted positive patients' mental health recovery and overall well-being in the community.

AH-12

Building up a Therapeutic Relationship with Our Patients and Ensuring Treatment Compliance and Satisfaction

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Background & Hypothesis:
Treatment defaults are a concern especially for patients with mental health issues. Lack of insight and poor family support are some factors that may contribute to this intricate question. At the Institute of Mental Health, case managers (CM) were introduced in 2003, primarily to ensure continuity of care besides care coordination. This paper describes the strategies involved and outcome measurement of its success.

Methods:
Data mining of patients placed on CM from December 2015 to March 2016 was done and the results analysed using Microsoft Excel. The strategies involved in the CM process were: assessment, planning, implementation, coordination, monitoring and evaluating options and services to meet patient and caregiver needs. Upon admission, a patient was assigned a CM, who, besides carrying out the strategies described, developed a therapeutic relationship with the patient and caregiver. At discharge, the patient was given a relapse prevention card and CM contact card. The CM gave the patient a 48-hour postdischarge call and reminder TCU calls. When the patient came for TCU, CM would meet the patient and followed up on his progress.

Results:
The first attendance average TCU rate of 682 patients with schizophrenia and delusional disorder during this period was 94%. The TCU average rate of another 732 patients with other diagnoses was 80.4%. CMs received >30 compliments from patients for their services.

Discussion & Conclusion:
Building up a therapeutic relationship with our patients and ensuring treatment compliance and satisfaction was possible with case management service.

AH-13

Severity of Knee Pain in Mature Hospital Female Nurses – A Comparison of Observed Knee Injury and Osteoarthritis Outcome Scores in Two Cohorts

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Background & Hypothesis:
The aim of this study was to report the severity of knee pain in female nurses above the age of 40 years working in a tertiary hospital in Singapore. In 2009, data was collected from 44 female nurses during a knee screening programme. Data from the Knee Injury and Osteoarthritis Outcome Score (KOOS) showed that nurses were prone to suffer from knee pain as compared to other subjects with related osteoarthritis with radiological degenerative changes.

Methods:
The KOOS questionnaire was administered to 69 female nurses in August 2015 at Tan Tock Seng Hospital (TTSH). Survey was performed during an educational talk on knee pain. Data collected for the 5 KOOS subscales of knee symptoms—pain, activities of daily living (ADL), sports/recreation and quality of life (QOL) was compared with results obtained in 2009.

Results:
The 2015 cohort had better self-reported knee function for 4 out of 5 subscales for knee pain ($P = 0.03$), function in ADL ($P < 0.05$), sports/recreation ($P = 0.02$) and QOL ($P < 0.01$) as compared to the 2009 cohort. Scores for knee function affecting QOL were found to be better ($P < 0.01$) for 2015 nurses above the age of 50.

Discussion & Conclusion:
It can be suggested that the better self-reported KOOS scores could be attributed to better working conditions at TTSH as compared to 6 years ago. This could be attributed to new lean workflow changes post-renovation of the general wards and specialist outpatient clinics and other initiatives such as ergonomics and wellness programmes for mature workers.

AH-14

Advance Care Planning Advocacy Workshop: Efforts to Raise Awareness and Promote Early ACP Discussions in a Tertiary Hospital in Singapore

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Background & Hypothesis:
Advance Care Planning (ACP) is a voluntary discussion on future health and personal care. It promotes self-autonomy, encourages an individual to think about their personal beliefs and share the goals of care with their family members and healthcare providers. In order to raise awareness amongst the healthcare professionals and promote ACP discussions upstream and in the community, the team introduced an ACP advocacy workshop.

Methods:
The 2-hour introductory ACP advocacy workshop aimed to promote ACP awareness by arming staff of all levels with the following learning outcomes: 1) the importance of ACP and Living Matters ACP framework, 2) the initiation of ACP discussion and its common misconceptions, 3) the local systems, practices and cultural sensitivities, and 4) the resources available that will help promote ACP in the community

Results:
The ACP advocacy workshop started in August 2015. To date, 3 workshops have been conducted, with a total number of 61 staff trained. The team received 57 course evaluation forms, of which 58% (33 out of 57) of the participants strongly agreed that the workshop was appropriate and applicable to their professional practice area. In demonstrating competency, more than 60% (35 out of 57) of the participants felt strongly competent in initiating ACP discussions.

Discussion & Conclusion:
With increasing awareness in TTSH, there is rising attendance at ACP advocacy workshops from various departments. It is an opportunity to upskill and expand staff capabilities to provide patient-centred care. The team is reviewing the curriculum to encourage group discussions with activities and to enhance the application of learning to the workplace.

AH-15

Impact of Distress Related to Attenuated Psychotic Symptoms in Individuals at Ultra-High Risk of Psychosis – Findings from the Longitudinal Youth at Risk Study (LYRIKS)

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Background & Hypothesis:
Recent studies have highlighted that attenuated psychotic symptoms (APS) are an important source of distress in ultra-high risk (UHR) individuals, and this distress is related to transition to psychosis (TTP). This study examined distress associated with APS in UHR individuals and investigated its association with TTP.

Methods:
The Comprehensive Assessment of At-Risk Mental State (CAARMS) was used to identify 173 UHR individuals, included as participants in the study. Distress related to APS was self-reported on the CAARMS. Associations between each of the 4 APS subscales in the CAARMS – non-bizarre ideas (NBI), perceptual abnormalities (PA), unusual thought content (UTC), and disorganised speech (DS) – with its distress level were examined. The association of distress with TTP at 1-year of follow-up was explored.

Results:
Of the 173 UHR participants, 154 (89%) reported distress related to 1 or more APS. NBI was rated to be the most distressing out of the 4 APS by the highest number of participants (32.9%) compared to UTC (12.1%), PA (24.9%) and DS (2.9%). Mean distress scores were significantly associated with CAARMS composite scores (P <0.001). However, there was no significant relationship between distress scores and functioning. Both mean distress scores (OR: 1.034, P = 0.034) and functioning (OR: 0.912, P = 0.041) were significant predictors of TTP at 1-year of follow-up.

Discussion & Conclusion:
This study provides additional evidence to link subjective distress experienced by UHR individuals to APS and to subsequent development of psychosis, and has important clinical implications.

AH-16

Haptoglobin and the Risk of Renal Progression in Diabetic Nephropathy: A Likely Causal Link in People with Type 2 Diabetes

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Background & Hypothesis:
Recent evidences suggest urine haptoglobin (uHp), an acute phase antioxidant, is associated with an increased risk of chronic kidney disease (CKD) progression in type 2 diabetes (T2D) independent of albuminuria level and other traditional risk factors. Using Mendelian randomisation (MR) approach, we investigated whether there is any causal role of uHp for CKD progression.

Methods:
A total of 422 T2D subjects with median follow-up of 4.0 (IQR: 2.8-5.7) years from KTPH DN cohort were recruited in this study. Subjects with annual eGFR decline ≥ 3 mL/min/1.73 m^2 were defined as progressor (269 non-progressor and 153 progressor). uHp level measured at baseline was normalised with urinary creatinine. Multivariate logistic analysis adjusted for demographic and clinical risk factors was performed to test the association between uHp and CKD progression. The causality for CKD progression was evaluated with MR, using the top signal from our genome-wide association study (GWAS) as the instrumental variable.

Results:
One SD increment in uHp was associated with 1.84-fold (95% CI, 1.35-2.50; $P < 0.0001$) increased risk for CKD progression after adjustment for multiple variables. In our GWAS, rs75444904 [A/C] in the Hp gene-region was strongly associated with uHp level ($\beta = 0.7216$; $P = 3.9 \times 10^{-20}$). In the MR, rs75444904 was associated with CKD progression (OR: 1.49; 95% CI, 1.03-2.15; $P = 0.036$) adjusting for age, gender and first 2 genetic PCA component, suggesting a causal relationship.

Discussion & Conclusion:
Our findings confirmed that uHp predicts risk of CKD progression independent of albuminuria. Moreover, MR analysis suggested a likely causal link between uHp level and risk of CKD progression in T2D.

AH-17

Longitudinal Monitoring of Circulating Tumour Cell-associated MicroRNA Expression Pattern in Metastatic Colorectal Cancer Patients on Oxaliplatin-based Chemotherapy

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Background & Hypothesis:
Colorectal cancer is now the most common cancer in Singapore. Circulating tumour cells (CTCs) in the circulation originating from solid tumours are fundamentally responsible for spawning metastasis, the main reason for mortality in cancer patients. MicroRNAs are small non-coding RNAs that play an important role in controlling their target mRNA expression, facilitating tumour growth and cancer progression, thus making them useful cancer biomarkers. This project aims to study CTC-associated microRNA expression profiles of a panel of microRNAs in RNA isolated from CTCs.

Methods:
Each patient with metastatic colorectal cancer under oxaliplatin-based chemotherapy had blood sampled at baseline and every other chemotherapy session. Samples were filtered through a microsieve and incubated with an antibody mixture containing DAPI and anti-CD45 which caused leukocytes to fluoresce blue and green, and anti-EpCAM which caused CTCs to fluoresce blue and red. Cells were eluted and partitioned onto the wells of a Greiner HLA Terasaki multiwell plate and CTCs were enumerated with the aid of a fluorescence microscope. CTC-containing wells were pooled together for microRNA extraction using the FTA Elute Card. cDNA was synthesised using reverse transcription and then analysed using real-time qPCR.

Results:
CTC-associated microRNA expression was profiled in the patients over the course of oxaliplatin-based chemotherapy. The results were correlated with the patients' clinicopathological outcomes, including CEA levels and CT imaging.

Discussion & Conclusion:
CTC-associated microRNA profiles studied in these patients will need to be confirmed in larger cohorts, but can be potentially used as predictive biomarkers for cancer progression and therapeutic targets.

AH-18

Exploring Caregiving Burden in Foreign Domestic Workers Who Care for Frail Seniors in Singapore

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Background & Hypothesis:
Previous studies have indicated that about 50% of family caregivers in Singapore enlist the help of foreign domestic workers (FDWs) in caring for a frail senior. However, there is a paucity of studies exploring how FDWs cope with caregiving responsibilities. This study examines caregiving burden in FDWs and factors predictive of increased burden.

Methods:
A total of 110 FDWs (Mage = 32.2 +1.08) recruited from a tertiary hospital's geriatric unit completed the Zarit Burden Interview (ZBI) which was administered in English, Burmese or Bahasa Indonesia. Univariate analysis and logistic regression were employed to investigate factors associated with high caregiving burden defined as the top quartile on the ZBI (scores ≥36/88).

Results:
Majority of the respondents were Indonesians (52.7%), married (53.8%), with children (57.0%), educated up to secondary school (71.0%) and had been providing care for >1 year (87.2%). Significantly, 26.4% reported physical health problems and 27.1% encountered language difficulties with employers. There was a statistically significant difference in ZBI scores for 2 groups: looking after a senior with dementia (SD) (F [2, 89] = 6.96, $P = 0.02$) and lacking privacy (F [1, 105] = 4.32, $P = 0.04$). On logistic regression, only caring for a SD ($P = 0.024$) significantly predicted higher burden with 8.88 times increased odds, $\beta = 2.18$, 95% CI, 1.33- 59.2

Discussion & Conclusion:
FDWs experience significant burden in the care of frail seniors. The findings reveal potential target areas to be addressed to alleviate caregiving stress and especially call for attention on FDWs caring for SD.

AH-19

Perceptions and Attitudes of Teenagers towards Seniors in Singapore

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Background & Hypothesis:
Given a rapidly ageing population, it is pertinent to understand how younger people view seniors in our society. As there has been no study on the issue hitherto, this study explores the attitudes and perceptions of teenagers towards seniors in Singapore.

Methods:
A total of 1405 secondary school students (Mage = 14.9 ± 1.30) provided information about their relationships with grandparents and attitudes towards seniors via a custom-designed questionnaire. Multiple regression and mediation analysis was employed to investigate factors influencing their perceptions towards ageing.

Results:
Majority (81.7%) considered age ≥60 as elderly. Many perceived ageing to be a time of peace and contentment (60.9%), that seniors were wise (57.1%), and could still contribute to family and society (55.4%). However, negative perceptions such as seniors being burdensome to family and society (55.4%) were also elicited. Staying with grandparents posed challenges to most teenagers (85.8%) as exemplified by difficulties in communication (46.4%) and conflicts due to differing values and beliefs (33.5%). Regression revealed that while teenagers' closeness to grandparents accounted for a significant 1.70% of the variance in their perception scores (ΔR^2= 0.017, F [1,1]) = 24.3, P <0.01), challenges explained for an increase in variance to 6.6% (ΔR^2= 0.066, F [1,1] = 46.7, P <0.01).

Discussion & Conclusion:
Teenagers possessed both positive and negative attitudes towards seniors. Efforts could be taken to nurture positive attitudes by addressing the challenges expressed via educational programmes and pastoral care initiatives.

AH-20

Development of a Diabetes-related Nutrition Knowledge (DRNK) Questionnaire for Individuals with Type 2 Diabetes Mellitus (T2DM) – A Pilot Study

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Background & Hypothesis:
The study aims to develop a questionnaire to assess DRNK, and examine its relationship with psychosocial self-efficacy in individuals with T2DM.

Methods:
A literature review was conducted to create the first draft, where user friendliness and ambiguity were tested (n = 10). Thereafter, the second draft was tested for item difficulty, index of discrimination and internal consistency (n = 30). The third draft was examined for construct validity and test-retest reliability (n = 60). The final draft was concurrently administered with the Diabetes Empowerment Scale to measure DRNK and psychosocial self-efficacy respectively (n = 28).

Results:
The questionnaire was found to be comprehensible and coherent. The item difficulty and index of discrimination scores ranged from difficult to desirable (13.3 to 86.7) and from poor to very good (-0.5 to 0.75), respectively. There was good internal consistency (Cronbach's alpha: 0.838) and construct validity (independent t-test: P <0.001). In addition, there was good test-retest reliability (Pearson's correlation: 0.71). In this cross-sectional analysis, subjects had fair knowledge and psychosocial self-efficacy scores (mean [SD]: 10.9/22 (3.81) and 4.35/8 [1.59], respectively). The association between DRNK and psychosocial self-efficacy was not significant (generalised linear model: P = 0.10).

Discussion & Conclusion:
The DRNK questionnaire has overall satisfactory psychometric properties to assess nutrition knowledge in individuals with T2DM. Our pilot study suggests that DRNK and psychosocial self-efficacy are independent. Therefore, it is important for healthcare practitioners to assess them separately.

AH-21

Evaluation of Lactate Dehydrogenase on Beckman Coulter DxC 800 Analyser

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Background & Hypothesis:
Lactate dehydrogenase (LDH) catalyses the reversible oxidation of L-lactate (L) to pyruvate (P) with the concurrent reduction of NAD+ to NADH. Due to its wide distribution, LDH levels are elevated in a variety of clinical conditions such as myocardial infarction, haemolytic anaemia, disorders of the liver, lung and muscle. This study evaluates the analytical performance of LDH (L to P) measurement on the Beckman Coulter DxC 800 analyser.

Methods:
LDH activity was measured by the enzymatic rate method. Three levels of manufacturer-supplied QC materials were analysed twice a day, for 10 days to assess imprecision. Analytical sensitivity was determined by running saline in 20 replicates. Linearity was assessed using dilutions of a patient sample in saline. Results from 73 patients were compared between the current LDH (P to L) and the new LDH (L to P) assays; 120 samples were taken from assumed healthy individuals to establish the reference interval (RI).

Results:
Day-to-day CV ranged from 2-4.7%. Analytical sensitivity was 0.5 U/L (claim: <5). The assay was linear to at least 726 U/L (claim: 750). LDH (L to P) readings were generally lower across the entire range (Deming regression: LDH (L to P) = 0.35*LDH (P to L) + 10). The calculated RI was 110-220 U/L (manufacturer's suggested RI: 98-192).

Discussion & Conclusion:
The LDH (L to P) measurement on the Beckman Coulter DxC 800 analyser shows good precision, sensitivity and linearity with a wide measuring range.

AH-22

Evaluation of Trinity Biotech Glucose-6-Phosphate Dehydrogenase Activity Guantitation on Beckman Coulter DxC 800

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Background & Hypothesis:
The glucose-6-phosphate dehydrogenase (G-6-PDH) activity measurement is used for the assessment of G6PD deficiency. We describe the analytical performance of the Trinity Biotech G-6-PDH kit on Beckman Coulter DxC 800 for comparison and replacement of the current qualitative screening test kit.

Methods:
The G-6-PDH activity was measured by the rate of formation of NADPH proportional to G-6-PDH activity at 340nm. The haemoglobin was measured using Beckman Coulter LH750 for conversion of G-6-PDH activity from U/L to U/g Hb. The QC materials (deficient and normal levels) were analysed for 20 days to assess imprecision. The analytical sensitivity was determined using manufacturer-supplied red cell lysing reagent. The linearity was assessed using dilutions of samples. A total of 20 patients (19 normal and 1 deficiency) were compared between the current qualitative test kit and the new Trinity Biotech quantitative assay method; 20 samples were taken from male individuals with no G6PD deficiency to validate manufacturer's reference interval.

Results:
Day-to-day CV for deficient and normal level were 54.2% and 7.5%, respectively. The analytical sensitivity was 96 U/L (claim: 48). The assay was linear up to 2617 U/L (claim: 2500). The comparison between quantitative to qualitative methods showed 100% agreement and the reference interval of 7.2-17.4 U/g Hb was validated.

Discussion & Conclusion:
The Trinity Biotech G-6-PDH test kit showed good imprecision for normal level and clinically acceptable imprecision at deficient level. The use of this kit will improve turnaround time and ease of test interpretation.

AH-23

Hepatitis B Surface Antigen Quantification – A New Tool in Hepatitis B Management

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Background & Hypothesis:
Hepatitis B surface antigen quantitation (HBsAgQN) assays are used for the in vitro quantitative determination of hepatitis B surface antigen (HBsAg) in confirmed HBsAg-positive human serum. This study evaluates Roche's HBsAgQN assay on the Cobas e601 immunoassay analyser.

Methods:
HBsAgQN assay utilises electrochemiluminescence immunoassay (ECLIA) technology. Both measuring cells (E-1, E-2) were evaluated for the assay's precision, analytical sensitivity and linearity. Precision was determined by running 3 levels of control material over 20 days. Analytical sensitivity was evaluated by running 20 samples of HBsAgQN diluent in a single run. Linearity studies were performed in duplicates using 5 different levels of anonymised, HBsAg-positive sera and values obtained were used to generate a linearity plot.

Results:
Evaluated precision for 3 levels of control material (L1-L3) for both measuring cells (E-1/E-2) in order were L1: (mean: 3.45/3.53 IU/mL, SD: 0.13/0.10 IU/mL), L2: (mean 85.84/86.79 IU/mL, CV%: 3.59/3.00%), L3: (mean: 85.13/87.89 IU/mL, CV%: 4.71/4.79%). Analytical sensitivity for both measuring cells verified with manufacturer's specification of <0.05 IU/mL. Manufacturer's linearity range (0.05-130 IU/mL) was verified to be linear from 0.22-112.05 IU/mL on E-1 and 0.21-114.75 IU/mL on E-2.

Discussion & Conclusion:
HBsAgQN assay's analytical sensitivity and linearity were verified on the Cobas e601 analyser. Although imprecision did not meet claimed specifications, results obtained were clinically acceptable. The availability of a rapid, accurate and precise quantitative HBsAg determination allowed physicians to assess patients' response to treatment and implement response-guided therapy algorithms to achieve optimal outcomes.

AH-24

Evaluation of Chromsystems Kit Set for Combined Analysis for Urinary Catecholamines and Metanephrines

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Background & Hypothesis:
Measurement of urinary catecholamines and metanephrines aids in the diagnosis of pheochromocytoma and paraganglioma. In this study, we evaluated Chromsystems kit set for combined analysis for urinary catecholamines and metanephrines on the Shimadzu Prominence-i HPLC system with the Chromsystems electrochemical detector.

Methods:
Intra (n = 20) and inter (n = 20) imprecision were assessed using 2 levels of QC. Linearity (using calibrators), limit of quantitation (LOQ), limits of blank (LOB) and carryover were also assessed. Urine from 20 assumed healthy subjects were used to validate National University Hospital's (NUH) existing reference interval (RI). Agreement studies were performed for urine catecholamines and metanephrines using 50 patients.

Results:
Imprecision (intra and interprecision) CV for urine catecholamines and metanephrines ranged from 0.52% to 5.82% and 1.04% to 7.38%, respectively. Noradrenaline, adrenaline and dopamine were linear to at least 2181 nmol/L (claim: 5910), 411 nmol/L (claim: 5459) and 6016 nmol/L (claim: 6527) respectively. Normetanephrines and metanephrines were linear to at least 10578 nmol/L (claim: 13646) and 5165 nmo/L (claim: 25355), respectively. LOQ for noradrenaline, adrenaline and dopamine were 1 nmol/L (claim: 6), 2 nmol/L (claim: 5) and 2 nmol/L (claim: 13), respectively. LOQ for normetanephrines and metanephrines were 11 nmol/L (claim: 22) and 27 nmol/L (claim: 20), respectively. LOB, carryover and agreement studies were acceptable. Two subjects were outside NUH RI.

Discussion & Conclusion:
Chromsystems kit set for combined analysis for urinary catecholamines and metanephrines showed good analytical performance. It has a short analytical time (catecholamines: 6 mins, metanephrines: 10 mins) and both tests utilise the same column and mobile phase.

AH-25

Nutritional Intake and Parameters of Asian Peritoneal Dialysis Patients Who Receive Regular Dietetic Intervention over a 25-Month Period

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Background & Hypothesis:
Limited research into the effectiveness of dietetic intervention for Asian peritoneal dialysis (PD) patients exists. The study aimed to explore the outcome of regular dietetic intervention over 25 months for Asian PD patients by identifying changes in nutritional intake and parameters.

Methods:
This study was conducted as a retrospective cohort design. A total of 79 Asian PD patients who had attended a minimum of 3 to 5 dietetic consults post baseline visit over 25 months were included. Patients received individualised dietary counselling at each consult. Changes in patients' daily energy intake (DEI) and daily protein intake (DPI), dry weight, body mass index (BMI), muscle mass, fat mass, mid-arm muscle circumference (MAMC), handgrip strength and serum albumin over time were examined. Random intercept model was used for data analysis. Statistical significance was set at <0.05.

Results:
For over 25 months, DEI, dry weight, BMI, muscle mass and fat mass remained stable in both groups (all $P > 0.05$). There was no significant difference in DPI and MAMC over time in APD patients. DPI was reduced but MAMC improved in CAPD patients (DPI $P = 0.002$; MAMC $P = 0.012$). Handgrip strength decreased over time in both CAPD (left $P = 0.002$; right $P = 0.028$) and APD (left $P \leq 0.001$; right $P \leq 0.001$) groups. No significant difference in albumin was observed over time in both groups.

Discussion & Conclusion:
This study had primarily demonstrated that regular dietetic intervention was promising in preventing deterioration in nutritional intake and parameters in an Asian PD population.

AH-26

Causes of Hoarding Disorder – A Systematic Review

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Background & Hypothesis:
Hoarding is a disorder characterised by excessive acquisition and persistent difficulty in discarding possessions. The behaviour has adverse emotional, physical, social, financial, and legal outcomes for the person with the disorder and family members, and might pose a significant public health problem. Hoarding has been included as a distinct disorder in the Diagnostic and Statistical Manual-Fifth Edition (DSM-5). The prevalence of hoarding disorder is approximately 2% to 5% globally. The current state of the evidence does not offer clear understanding of the causes of hoarding behaviours. A systematic review of the extant literature was carried out to determine the causes of hoarding behaviours.

Methods:
This systematic review is conducted in line with PRISMA guidelines. The following electronic databases: Medline through Ovid, EMBASE and PsycINFO were searched for relevant articles published between January 2000 and April 2016. Articles only published in the English language were included. Two reviewers independently scrutinised the studies and included them in this review.

Results:
Our search strategy returned a total of 498 references. Preliminary findings suggest that there is a genetic association in individuals with hoarding behaviours; abnormal neural activity in the frontotemporal, parahippocampal gyrus and insular parts of the brain has also been identified. Traumatic life experiences have also been posited to predispose individuals to hoard.

Discussion & Conclusion:
Although the understanding of hoarding disorder has grown in recent years, greater efforts are still needed to clarify the aetiology and mechanisms of hoarding disorder as these may help in planning of more holistic interventions to treat the problem.

AH-27

Molecular Epidemiologic Differences of Methicillin-Resistant *Staphylococcus aureus* between Healthcare Facilities and Anatomic Sites

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Background & Hypothesis:
Methicillin-resistant *Staphylococcus aureus* (MRSA) is a major clinical problem. Our study aims to compare the molecular epidemiology and distribution of MRSA between the anatomic sites among patients of an acute hospital (AH) and its affiliated intermediate-(ITC) and long-term care facilities (LTC).

Methods:
We conducted a cross-sectional MRSA surveillance study over 6 weeks in 2014. Nasal, axillary, and groin swabs were cultured separately for MRSA and subjected to whole-genome sequencing. Epidemiologic data were obtained from medical records and associations with MRSA strains made. Multivariable logistic regression models were constructed to control for confounding.

Results:
A total of 1700 patients were screened. MRSA prevalence in ITC and LTC were thrice (OR: 3.18; 95% CI, 2.37-4.28; P <0.001) and twice (OR: 1.91; 95% CI, 1.38-2.65; P <0.001) than that in AH. Clonal complexes (CCs) 22 and 45 were the dominant strains. After adjusting for age, gender, comorbidities, and prior hospitalisation, the CC22 strain was positively associated with nasal colonisation (OR: 2.07; 95% CI, 1.26-3.41; P = 0.004) and with the acute hospital (OR: 2.54; 95% CI, 1.30-4.94; P = 0.006) and intermediate-care facilities (OR: 2.34; 95% CI, 1.12-4.87; P = 0.024). The CC45 strain was more likely to be associated with cutaneous colonisation (OR: 1.99, 95% CI, 1.19-3.30; P = 0.008) and intermediate-care facilities (OR: 2.31; 95% CI, 1.09-4.89; P = 0.028) than long-term care facilities.

Discussion & Conclusion:
MRSA prevalence in ITC and LTC was significantly higher than AH. The molecular epidemiology of MRSA differed across healthcare facilities, with CC22 being more dominant in AH and ITC than LTC. CC22 was positively associated with nasal colonisation whereas CC45 with cutaneous colonisation.

AH-28

Examining the Relationship between Patient's Demographics and Readmission Rates

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Background & Hypothesis:
According to the biopsychosocial model, causation and outcome of a disease can be attributed to biological, social and psychological factors. This survey aims to explore the relationship between biological (age) and social factors (race and marital status) and outcome of psychiatric condition (readmission rate).

Methods:
Patients admitted into an acute ward and cases managed from December 2015 to April 2016 were enlisted. Data was analysed using Microsoft Excel.

Results
A total of 360 male patients were admitted. Of the patients, 80% were admitted more than 28 days after last discharge while 20% were admitted less than 28 days after last discharge. In terms of patients who were readmitted in less than 28 days, 82% of them were single, 13% married and 4% divorced; 72% Chinese, 11% Indian, 9% Malay and 7% others; 27% aged 41-50; 21% aged 31-40, 17% aged more than 60, 13% aged 21-30, 13% aged 51-60 and 10% aged less than 21. In terms of patients who were readmitted in more than 28 days, 71% were single, 22% married and 6% divorced; 70% Chinese, 16% Malay, 13% Indian and 2% others; 24% aged 41-50, 21% aged 51-60, 20% aged 31-40, 18% aged 21-30, 9% aged more than 60 and 8% aged less than 21.

Discussion & Conclusion:
Male patients who are single, Chinese or aged 41-50 were more likely to be readmitted. Thus, more intensive case management services namely telephone calls and supportive counselling can be provided for them.

AH-29

Risk Factors Associated with Severe Influenza Virus Infection: A Case-Control Study

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Background & Hypothesis:
Influenza virus infection is known to cause excessive hospitalisations and deaths in the elderly during seasonal peaks and pandemics.

Methods:
We conducted a case-control study on severely ill influenza patients admitted to a 1600-bedded adult tertiary public hospital from January 2011 to December 2014. We analysed the potential clinical risk factors associated with severely ill cases and in-hospital all-cause mortality.

Results:
A total of 287 severely ill unique patients (who required intensive care and/or died) were identified during the study period; 861 controls were randomly selected. The study population was predominantly elderly (70% aged ≥65 years) and the male-to-female ratio was 1.1:1; 83% had Charlson score ≤3. On multivariate analysis, after adjusting for age, gender, hospitalisation within the past 6 months and admission year, factors independently associated with severe influenza were Charlson score (AOR 1.75, 95% CI 1.57-1.94), influenza subtype A/H1N1-2009 (AOR 1.87, 95% CI 1.23-2.85), nosocomial influenza (AOR 3.43, 95% CI 1.81-6.50), and existing statin users (AOR 0.62, 95%CI 0.46-0.85). In a multivariable logistic regression model, predictors of in-hospital all-cause mortality were age (AOR 1.03, 95% CI 1.02-1.04), Charlson score (AOR 1.64, 95% CI 1.47-1.83), nosocomial influenza (AOR 2.86, 95% CI 1.47-5.59) and existing statin user (AOR 0.54, 95% CI 0.37-0.78) after adjusting for gender, hospitalisation within the past 6 months, influenza subtype and admission year.

Discussion & Conclusion:
Our findings highlighted that cases with nosocomial influenza or higher Charlson score were more likely to become severely ill. Chronic statin use decreased mortality risk. Further studies are needed to evaluate factors which may improve the survival of hospitalised influenza patients.

AH-30

Characteristics of Hospital-associated Influenza in a Tertiary Care Adult Hospital in Singapore, 2011-2015

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Background & Hypothesis:
Hospital-associated influenza is known to contribute to morbidity and mortality among hospitalised patients.

Methods:
We conducted a retrospective review of all patients with laboratory-confirmed influenza from January 2011 to December 2015, and compared community-associated (CA, laboratory-confirmed influenza <=3 days after admission) with hospital-associated (HA, laboratory-confirmed >3 days after admission) influenza.

Results:
There were 5729 patient-admissions (69% aged ≥65 years, 51% female and 3.3% of HA) with influenza A/H3 (59%), A/H1N1-2009 (16%), B (16%) and A/subtype-undetermined (9%) during the study period. HA cases were more likely to be of older age ($P = 0.037$), or have chronic medical conditions such as cerebrovascular disease ($P <0.001$), congestive heart failure ($P = 0.002$), renal disease ($P = 0.045$), any malignancy ($P <0.001$) or HIV infection ($P <0.001$). The median length of stay after influenza diagnosis for HA influenza (8 days) was greater than that for CA influenza (4 days) ($P <0.001$). A larger proportion of HA cases (18%) than CA (7%) cases needed ICU care or died ($P <0.001$). On multivariate analysis, factors independently associated with HA influenza were comorbidities of cerebrovascular disease (AOR 2.85, 95% CI 1.78-4.56), congestive heart failure (AOR 1.57, 95% CI 1.05-2.35), any malignancy (AOR 2.85, 95% CI 1.70-4.79), and HIV infection (AOR 13.32, 95% CI 4.08-43.46). In contrast, chronic pulmonary disease (AOR 0.56, 95% CI 0.36-0.86) and influenza B (AOR 0.58, 95% CI 0.39-0.88) were less common in HA influenza, after adjusting for age and gender.

Discussion & Conclusion:
Annual influenza vaccination should be actively promoted not only to patients with chronic medical conditions but also to healthcare workers attending to patients, to prevent HA influenza.

AH-31

Clinical Presentations of Severely Ill Patients with Influenza: The Experience of an Adult Tertiary Care Hospital in Singapore

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Background & Hypothesis:
Influenza virus infections are characterised by non-specific constitutional and respiratory symptoms. Fewer reports are available on the clinical presentation of severely ill adult patients with laboratory-confirmed influenza.

Methods:
We compared the characteristics of severely ill (requiring intensive care and/or died) versus non-severely ill patients with laboratory-confirmed seasonal influenza admitted to an adult tertiary care hospital in Singapore in 2011-2014.

Results:
During the study period, a total of 287 severely ill patients and 861 randomly selected controls were identified. The study population was predominantly elderly (70% aged ≥65 years) and the male-to-female ratio was 1.1:1; 83% had Charlson score ≤3. Severely ill patients presented more often with breathlessness ($P <0.001$), dysuria ($P = 0.055$), altered mental status ($P <0.001$), crackles ($P <0.001$) and consolidation changes on CXR ($P <0.001$), and less with fever ($P <0.001$), sore throat ($P <0.001$), productive cough ($P <0.001$), headache ($P <0.001$), myalgia ($P <0.011$) and nausea ($P = 0.002$). On multivariate analysis, after adjusting for age, gender, influenza subtypes and existing comorbidities, breathlessness (AOR 1.94, 95% CI 1.34-2.80), dysuria (AOR 5.59, 95% CI 1.96-15.90), altered mental status (AOR 10.87, 95% CI 5.44-21.73), productive cough (AOR 0.43, 95% CI 0.31-0.61), headache (AOR 0.28, 95% CI 0.08- 0.99), crackles (AOR 3.17 95% CI 2.23-4.50) and consolidation changes on CXR (AOR 2.00, 95% CI 1.36-2.94) were symptoms and signs independently associated with severe illness in influenza patients.

Discussion & Conclusion:
Clinical presentation of adults infected with seasonal influenza did not differ between different subtypes. However, there were more complaints of breathlessness, dysuria and altered mental status, and these symptoms may help differentiate between severe and non-severe illness among patients admitted with influenza.

AH-32

Risk Factors of Influenza-associated Critical Illness in Adult Tertiary Care Hospital in Singapore

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Background & Hypothesis:
Seasonal influenza is the most common vaccine-preventable disease. However, little is known about the risk factors of critical illness due to influenza virus infections.

Methods:
Retrospective review study was done on admitted patients with laboratory-confirmed influenza from January 2011 to December 2015 to evaluate risk factors for poor outcomes using multivariate logistic regression.

Results:
A total of 5421 unique patients were identified during the study period. The study population was predominantly elderly (69% aged ≥65 years) and male to female ratio was 1:1.1; 92% had Charlson score <3. Patients with chronic medical conditions of congestive heart failure (P <0.001), renal disease (P <0.001), any malignancy (P = 0.018) were more likely to need intensive care or die. On multivariate analysis, age (AOR 1.01, 95% CI 1.00-1.01), male gender (AOR 1.28, 95% CI 1.04-1.58), background chronic medical conditions of congestive heart failure (AOR 3.73, 95% CI 2.90-4.80), renal disease (AOR 1.68, 95% CI 1.18-2.39), malignancy (AOR 1.89, 95% CI 1.20-2.99) and influenza A/H1N1-2009 (AOR 1.43, 95% CI 1.06-1.92) were independent predictors of patients with critical illness requiring intensive care or mortality. In a multivariable logistic regression model, predictors of in-hospital all-cause mortality were age ≥65 (AOR 1.77, 95% CI 1.26-2.49) and Charlson's comorbidity score (AOR 1.21 95% CI 1.12-1.29), after adjusting for gender and influenza subtypes.

Discussion & Conclusion:
Influenza-associated critical illness was more common in older individuals and those with significant comorbidities. Annual influenza vaccination for these high-risk groups is highly recommended. Ongoing surveillance is vital to monitor for risk factors for complications of influenza virus infections.

AH-33

Screening of Methicillin-resistant *Staphylococcus aureus* (MRSA) Carriage: PCR versus Culture

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Background & Hypothesis:
Rapid detection of methicillin-resistant *Staphylococcus aureus* (MRSA) carriage in patients, followed by pre-emptive isolation or cohorting, can prevent nosocomial transmission. This study aims to compare the performance of rapid polymerase chain reaction (PCR) test with culture for MRSA screening of patients at admission to a tertiary-care hospital.

Methods:
We conducted a historical cohort study on patients admitted to the Communicable Disease Centre from March 2012 to March 2016. Patients screened for MRSA colonisation with both culture and PCR, within 24 hours of admission, were included. Each patient had a combined nasal-axillae-groin (NAG) or nasal-axillae-groin-throat (NAGT) swab taken and cultured using selective chromogenic agar plate (MRSASelectTM, BioRad, France), and a separate nasal swab tested by real-time PCR (GeneXpert, Cepheid).

Results:
A total of 3205 patient admissions were included. Two-thirds (67.6%) were male and the majority (88.5%) were under 65 years of age. Majority (88.6%) had Charlson's comorbidity index of <4. The prevalence of MRSA carriage on admission was 3.7%. Compared to culture, PCR had sensitivity, specificity, positive and negative predictive values (NPV) of 87.3%, 96.7%, 50.2%, and 99.5% respectively. For patients with diabetes and/or malignancies, the sensitivity of PCR increased to 91.7% while NPV remained at 99.2%.

Discussion & Conclusion:
PCR has high specificity and NPV, enabling it to accurately exclude MRSA carriage. Its rapid turnaround time is particularly useful in acute hospitals with high volumes of admissions. PCR has added utility in patients with diabetes and malignancies due to increased sensitivity.

AH-34

Stress, Disengagement Coping Style, and Sedentary Behaviour in Coronary Heart Disease Patients

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Background & Hypothesis:
Although reducing sedentary behaviour is a recommended lifestyle change for coronary heart disease (CHD) patients, there is a dearth of research investigating how stress and coping styles may influence sedentary behaviour. Disengagement coping is a coping style in which an individual directs attention away from the stressor or from one's emotions and thoughts. This study examined whether disengagement coping would exacerbate stress to increase sedentary behaviour.

Methods:
Participants were 88 CHD patients (mean age = 63.6 years) participating in cardiac rehabilitation. They completed questionnaires measuring disengagement coping style, perceived stress, and sedentary behaviour. Age, gender, education, type of residence, body mass index, and history of dyslipidaemia were included as control variables in the models.

Results:
Hierarchical multiple regression analysis showed a significant interaction between stress and disengagement coping (β = -0.31, P = 0.01). Simple slope analysis showed that for patients using more disengagement coping, when under higher stress, they showed lower sedentary behaviour (β = -0.31, P = 0.03); in contrast, for patients using less disengagement coping, when under higher stress, they showed more sedentary behaviour (β = 0.33, P = 0.05).

Discussion & Conclusion:
Contrary to hypothesis, adopting a disengagement coping style when under high stress appeared to be associated with lower sedentary behaviour among CHD patients. Stress management for patients should take into account specific role of coping in promoting healthy behaviour.

AH-35

Detecting and Characterising Harm Associated with Ciclosporin Therapy in Dermatology Outpatients Using Medication-specific Trigger Tool

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Background & Hypothesis:
Ciclosporin is a high-risk medication used extensively as immunosuppressant for multiple dermatological conditions. Despite its established clinical history and safety profile, an efficient and reliable process for detecting, measuring, and characterising harm is needed to advance safe ciclosporin use. This study seeks to detect, measure, and characterise the adverse drug events (ADEs) associated with oral ciclosporin therapy in dermatology outpatients using a medication-specific trigger tool.

Methods:
A medication-specific trigger tool was developed to detect, measure, and characterise ADEs in dermatology outpatients on ciclosporin therapy. All outpatients on ciclosporin therapy with a minimum of 3 consultation visits in 2014 were reviewed. The ADEs detected were characterised by ADE types, causality of ADE, severity of harm, and preventability.

Results:
Among the 199 outpatients reviewed, 44 outpatients (22.1%) experienced at least 1 ADE resulting in patient harm – 1 ADE (34), 2 ADEs (9), and 3 ADEs (1). A total of 55 ADEs were identified – Type A (37) and Type C (18). All the ADEs were categorised as NCCMERP Category E (temporary harm to patient and required intervention) and had probable or possible causal association with ciclosporin therapy. The top 5 ciclosporin-induced ADEs were hypertension, hyperlipidaemia, muscloskeletal ache and weaknesses, gingival hyperplasia, and nausea and vomiting. There were 5 probably-preventable ADEs that resulted from minor lapses in routine monitoring of vital signs and metabolic side-effects.

Discussion & Conclusion:
Medication-specific trigger tool is effective in detecting, measuring, and characterising harm (ADEs); providing comprehensive data is essential for improving the safety of ciclosporin therapy in dermatology outpatients.

AH-36

Platelet Function Analysis by Impedance and Light Transmission Aggregometry

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Background & Hypothesis:
Platelets play a key role in both haemostasis and thrombosis. Accurate measurement of platelet function is essential for diagnosing patients with platelet dysfunction and for monitoring of antiplatelet therapy. The gold standard of platelet function testing, light transmission aggregometry (LTA) using platelet-rich plasma is considered to be a non-routine high complexity assay. Hence, the development of newer generation platelet function analysers such as whole blood Multiple Electrode Aggregometry (MEA) targets to provide a standardised platelet function analysis in routine clinical practice. The objective of our study is to compare platelet function analysis using LTA and MEA.

Methods:
Whole blood samples were collected into citrate and hirudin tubes from 10 volunteers. The platelet aggregation responses were tested with adenosine diphosphate (ADP), arachidonic acid, collagen and ristocetin. Results were analysed for percentage Amplitude for LTA and area-under-curve (AUC) for MEA.

Results:
Platelet function testing by LTA and MEA yield comparable interpretation in more than 80% of the testing. Two samples stimulated with ADP showed primary wave only on LTA trace and reduced AUC on MEA. Four out of 10 samples stimulated with ristocetin gave rise to normal LTA trace but reduced MEA.

Discussion & Conclusion:
While LTA and MEA employ different principles of detection, both methods yield comparable results when stimulated with ADP, arachidonic acid and collagen. We observed weaker ristocetin induced response by MEA was likely attributed to reduced von Willebrand factor in the diluted whole blood assay. Further optimisation of MEA may prove to be applicable for routine platelet function analysis.

AH-37

Nurses-led Function-focused Care Maximise Mobility to Achieve Therapy Goals in Sub-Acute Recovery Ward 82 of Tan Tock Seng Hospital

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Background & Hypothesis:
Functional deconditioning is a common result of prolonged bed rest in hospital, with patients spending at best only 30 minutes per out of bed during therapy sessions. With literature widely supporting the benefits of increasing therapy time to improve functional recovery, reliance on one allied health profession clearly fell short. Hence, we involved nurses in engaging patients in physiotherapy-recommended activities throughout the day. The primary aim of the project was to increase the patients' time out of bed for functional activities.

Methods:
A FRAM (functional resonance analysis method) model for redesign was used for our clinical process improvement project. Existing everyday work processes were first analysed. A Function-focused care model was then introduced to involve nurses in patients' functional activities. The number of mobilisations was then recorded, and both subjective patient surveys and objective functional assessment scales of Modified Barthel Index (MBI) score and Modified Elderly Mobility Scale (MEMS) were measured.

Results:
With the engagement of nurses, patients' mobilisation increased sixfold; 1091 out of bed activities were recorded for 38 patients during the study period of 2 months, with the majority (86.5%) of them being carried out by nurses. Both the MBI ($P = 0.0001$) and MEMS ($P = 0.0008$) scores improved significantly. Patient surveys reflected an overall improvement in their general health and overall confidence in performing their activities of daily living and mobility.

Discussion & Conclusion:
A function-focused care model achieved the common goal of increasing mobilisation to improve functional outcomes and patient satisfaction at no additional manpower or cost.

AH-38

Evaluation of Risk Assessment Models (Padua and Caprini) in the Prediction of Venous Thromboembolism Events: A Retrospective Review

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Background & Hypothesis:
This study aimed to evaluate the effectiveness of Padua and Caprini risk assessment models (RAMs) in predicting venous thromboembolism (VTE) events and identify the most common risk factors of VTE.

Methods:
This is a single-centred, case-control study. Patients at risk of VTE who underwent radiological scans from January 2014 to December 2014 were included. Patients' VTE risk scores and demographics were assigned and collected respectively. Stepwise selection model and multivariate analysis were performed to identify the most common risk factors of VTE.

Results:
A total of 100 patients with VTE and 50 patients without VTE were identified. Area under the receiver operating characteristic curves (AUROCs) of Padua and Caprini RAMs were 0.603 and 0.619 respectively. Stepwise selection model (AUROC = 0.909) and multivariate analysis (AUC = 0.870) were performed. The risk factors identified by these analyses were previous VTE, age ≥70, major open surgery >45 minutes, bed confinement of >72 hours and acute myocardial infarction (MI)/stroke. A subgroup analysis of patients who have undergone surgery and/or are immobilised identified age ≥70 and acute MI/stroke as risk factors. These results suggest age ≥70 and acute MI/stroke may be more compelling than other factors in predicting VTE events.

Discussion & Conclusion:
Our findings suggest that Padua and Caprini RAMs may not be good predictors of VTE. However, these RAMs recommended by CHEST guidelines remain the best available models and are relevant in identifying patients at risk of VTE. The identification of pertinent risk factors provides insight into Asian patients who may be predisposed to VTE.

AH-39

Age of Illness Onset among Asian Female Schizophrenia Patients

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Background & Hypothesis:
This study aims to explore the age of onset of schizophrenia among Asian females of 3 different age groups. It is hypothesised that most Asian female patients experienced an onset of schizophrenia during middle age. More Asian female patients are also hypothesised to experience late-onset schizophrenia (LOS) than early-onset schizophrenia (EOS).

Methods:
Data from 59 Asian female schizophrenic patients admitted in IMH's general psychiatry female ward from December 2015 to May 2016 was utilised. Females with EOS were diagnosed between 18-30 years old. Middle age onset schizophrenia (MOS) was diagnosed in females between 31-45 years old and LOS in females after 45 years old.

Results:
It was found that 30.5% of the sample experienced EOS, while 42.4% experienced MOS and 25.4% experienced LOS. Therefore, the hypothesis that most Asian female patients experienced an onset of schizophrenia at an average of between 18-30 years old is supported. However, the hypothesis that Asian females are more likely to experience LOS than EOS is not supported as 5.1% more patients were found to experience EOS than LOS.

Discussion & Conclusion:
Current findings show that increasingly, Asian females are experiencing an onset of schizophrenia at an earlier age. Therefore, psychosocial interventions, such as rehabilitation programmes and aftercare services, need to be tailored to meet the needs of a younger Asian population. Future studies could explore factors in modern society that contribute to EOS, so as to better facilitate professionals' efforts in tailoring suitable interventions in the early phases of their illness.

AH-40

Use of Low Level Laser Anaesthesia for Teeth Extraction

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Background & Hypothesis:
The use of laser in dentistry is not new, as it is already used for oral mucositis, gingiva and surgical wound. However, laser anaesthesia in teeth extraction is new and first of its kind. The author sets out to find the analgesic effect for molar and fractured premolar extraction.

Methods:
Probe "A"-638nm/150 mW delivered 135 Joules/cm^2 was directed at the molars for 15 minutes. Probe "B"- Superpulsed Cluster 5x904nm/30W delivered 37 Joules/cm^2 on the opposite cheek was applied for 25 minutes. Probe "C" Multi-cluster 810nm/6x500mW delivered 1,056 Joules/cm^2 was applied for 14 minutess prior extraction.

Results:
Extraction proceeded after the"sensitivity" test but sharp acute pain was experienced at the point of extraction. Immediately, Probe "A" was applied at the molar and Probe "B" on the opposite cheek for 5 minutes, and then the premolar was extracted without pain.

Discussion & Conclusion:
Due to drug allergies, laser anaesthesia is used for teeth extraction. There was no discomfort and bleeding after the gauze was removed at home. Except at the point of extraction, the procedure went smoothly. Without past references of laser dosage requirement, the estimated dosage is 25 minutes with a total 1228 Joules/cm^2 energy irradiation. This could be the reason for the pain experienced. If a longer time of laser irradiation could have been applied in preparation, one can have a pain-free experience. Laser anaesthesia has the potential to provide pain relief as results show that it is especially suitable for the elderly and those with allergies. Further studies are needed to validate its effects.

AH-41

The Effectiveness of Case Management Support for Patients in the Adult Neurodevelopment Service (ANDS)

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Background & Hypothesis:
Treatment adherence is an important consideration for the care of patients with psychiatric conditions. At the Institute of Mental Health (IMH), case management (CM) service was introduced in the Adult Neurodevelopmental Service (ANDS) to coordinate and support patients and their caregivers. The population of ANDS patients consists of autism spectrum disorder (ASD) and intellectual disability (ID). This paper aims to explore the clinical outcomes of CM support for patients with neurodevelopmental issues and also explore differences in clinical outcome between patients with ASD and patients diagnosed with ASD and ID.

Methods:
Data mining of newly referred patients placed in the ANDS service from February 2015 to January 2106 was done. The result analysed was done via Microsoft Excel.

Results:
Eighty patients were case managed, males (n = 72) and females (n = 8) between the ages of 19 to 65 years old. There are 43 patients who are diagnosed with autism spectrum disorder, males (n = 40) and females (n = 3), and 37 patients who are diagnosed with both autism spectrum disorder and intellectual disability, males (n = 32) and females (n = 5). They were provided with psychoeducation, supportive counselling and telephonic reminders for their appointments as well as meet-ups at the clinic. Results showed that 94% of patients in ANDS service are treatment adherent. There is no significant difference in treatment adherence between patients with ASD (91%) and patients with ASD and ID (96%).

Discussion & Conclusion:
Case management (CM) intervention has shown to be effective in regards to treatment adherence among outpatients in the ANDS population.

AH-42

A Case Management Perspective on the Clinical Outcome of Multidisciplinary Approach for Patients with Severe or Treatment-resistant OCD under Adult OCD Clinic

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Background & Hypothesis:
According to the Singapore Mental Health Study, OCD is amongst the top 3 most common mental disorders in Singapore, affecting approximately 1 in 33 people (SMHS, 2010). Adult OCD clinic is a specialised service that offers intensive evidenced-based pharmacological and psychological treatment with joint case management to patients with severe or treatment-resistant OCD. The objective is to study the impact of a multidisciplinary approach on patients with severe or treatment-resistant OCD.

Methods:
Data mining was done for patients who attended the clinic from January 2015 to January 2016. The clinical outcome is measured by the use of emergency department, admission rates, and length of stay (days).

Results:
The sample data is based on the 80 referrals received at the severe end of spectrum, comorbid illnesses, poor functioning and social issues by Adult OCD clinic. Of these, 46 patients underwent treatment and received case management in the form of telephonic follow-up and meeting patients in clinic for non-adversarial problem-solving, coordination of services, patient advocacy, and consensus building. The data has indicated a 50% decrease in admission rates and emergency department visits, as well as 52% decrease in length of stay (days).

Discussion & Conclusion:
Outcome data indicated improvement in severity in the form of decreased use of emergency department, admission rates, and length of stay (days) through case management alongside intensive evidence-based pharmacological and psychological treatment.

AH-43

Eliminating Long-Term Inappropriate Use of Omeprazole

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Background & Hypothesis:
A background check of Ward 53A revealed a 30% rate of possible non-justified chronic use of the proton-pump inhibitor omeprazole. Such use may not only have little benefit, but subject patients to the risk of adverse effects from long-term use. The team aimed to eliminate such non-justified chronic use. Such use may not only have little benefit, but also subject patients to the risk of adverse effects from long-term use. The team aimed to eliminate such non-justified chronic use.

Methods:
Group meetings were held to discern the root causes of the problem. A 15-minute brainstorming session and categorisation of the root causes yielded an Ishikawa diagram. Thereafter, a multi-voting session was conducted to narrow down the root causes to 4 priority causes to be intervened on. Based on the root causes identified, interventions addressing each root cause were formulated and implemented in a step wise manner.

Results:
The team achieved a 19% reduction in the number of patients on unjustified chronic omeprazole by the third month, and full elimination (0%) by the sixth month.

Discussion & Conclusion:
Significant decisions such as eliminating chronic use of omeprazole can be accomplished, but requires a shift in work culture to encourage such changes. The review and discontinuation of unnecessary medications can be accomplished through appropriate interventions and workflow changes. Although it seems trivial, it represents a significant part of medication management in patients.

AH-44

Self-Perceived Burden and Depression among Patients with Coronary Heart Disease: The Moderating Role of Social Support

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Background & Hypothesis:
The aim of the study was to investigate the effects of self-perceived burden and social support on depression in patients with coronary heart disease (CHD).

Methods:
Eighty-six CHD patients participating in cardiac rehabilitation responded to a battery of psychosocial measures. Hierarchical multiple regression analyses were conducted. Age, gender, education level, history of myocardial infarction, hypertension, coronary artery bypass surgery and angioplasty were controlled for in the analysis.

Results:
Of the participants, 19% reported moderate to severe depressive symptoms, and 47% of the respondents indicated that they experienced significant levels of self-perceived burden. Social support ($\beta = -0.438$, $P < 0.001$) and self-perceived burden ($\beta = 0.312$, $P = 0.004$) were found to be significant independent predictors of depressive symptoms. Additionally, social support was found to moderate the impact of self-perceived burden on depressive symptom severity, $\beta = -0.312$, $\Delta R^2 = 0.092$, $P = 0.001$. Simple slope analyses revealed significant positive associations between self-perceived burden and depression at low ($b = 0.287$, $P < 0.001$) and average ($b = 0.132$, $P = 0.024$) levels of social support, but not for high levels of social support ($b = -0.024$, $P = 0.744$).

Discussion & Conclusion:
Self-perceived burden appeared to be a common experience among CHD patients. In addition, social support appeared to be a protective factor against self-perceived burden. Assessing feelings of self-perceived burden and levels of social support may help identify CHD patients at higher risk for depression.

AH-45

Prevalence and Associations of Disordered Eating Behaviours in Outpatients in a Tertiary Care Psychiatric Hospital

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Background & Hypothesis:
Disordered eating (DE) behaviours include any unhealthy pattern of eating 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 DE behaviours are comorbid with psychiatric illness; however, information is lacking in Asian populations. This study aims to identify the prevalence and correlates of DE behaviours in outpatients in the Institute of Mental Health, Singapore.

Methods:
Data was collected from 330 outpatients between the ages of 15-40 diagnosed with either schizophrenia spectrum disorder (n = 155), depressive disorders (n = 155), or substance use disorders (n = 20). At risk eating problems were measured using the Eating Attitudes Test (EAT-26). Statistical analysis was conducted using regression models and ANOVA tests.

Results:
EAT-26 scores (cutoff score >19) indicated that 11.2% of our sample population of outpatients had at risk eating behaviours. DE was associated with female gender, younger age groups, Indian and Other ethnicity, university level education, and BMI scores <18.5. Furthermore, DE was significantly linked to body dissatisfaction, increased anxiety and depressive symptoms and lower quality of life.

Discussion & Conclusion:
Our results suggest that, similar to Western populations, DE behaviours are highly prevalent in a psychiatric outpatient population in Singapore. Approximately 1 in 10 outpatients were found with DE behaviour; hence comorbidity between mental illness and DE must be detected and addressed early by clinicians since these behaviours could have an adverse impact on the patient's well-being and recovery over time.

AH-46

Moderate to Severe Self-Injury among Adolescents Seeking Treatment in IMH

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Background & Hypothesis:
Moderate to severe types of self-injury (MSSI) such as deliberately cutting and burning one's skin is common in adolescent clinical populations and is associated with poorer clinical and social outcomes like suicidal behaviour and future unemployment. MSSIs tend to be performed in private, thus, they often go undetected and not effectively addressed. We examined the prevalence and risk factors of MSSIs among adolescents seeking outpatient treatment in IMH.

Methods:
A total of 108 participants between 14-19 years old were recruited from the IMH adult and child outpatient clinics. Diagnosis was extracted from medical records. Participants completed self-report questionnaires through an iPad. Sociodemographic data (age, gender, ethnicity, education level, sexual orientation), total score on the Childhood Trauma Questionnaire and presence of MSSIs in the past year as identified on the Functional Assessment of Self-Mutilation were used in the present analysis.

Results:
Majority of the participants were diagnosed with mood disorders (38%) followed by anxiety disorders (19%), adjustment disorders (19%), disorders usually diagnosed in childhood (e.g. attention deficit hyperactivity disorder, autism spectrum disorders; 10%), schizophrenia (7%) and other disorders (7%). More than half the sample endorsed MSSIs (55%). Logistic regression showed that the preponderance of injurers were females (OR: 4.1), older in age (OR: 1.7), identified with a non-heterosexual orientation (e.g. gay, lesbian, bisexual; OR: 9.7), and had experienced abuse or neglect (OR: 1.3).

Discussion & Conclusion:
A high prevalence of MSSI was observed. It is important for clinicians to be attentive to MSSIs particularly in patients presenting with the above-reported risk factors so that this can be more effectively addressed, and overall patient outcomes improved. Future research is needed to explore mechanisms underpinning these associations.

AH-47

Development of an Algorithm to Aid Clinical Decisions for Offloading of Plantar Forefoot Ulcers and Charcot Deformities

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Background & Hypothesis:
Various offloading devices such as total contact casts or walker boots are essential in managing plantar foot ulcers (PFU) and Charcot deformities. Selection of the right device requires consideration of factors such as wound classification, stage of deformity, ambulatory status and cognitive function. We aimed to develop and evaluate an algorithm to facilitate clinical decision-making in prescribing effective and appropriate offloading devices for patients with PFU and Charcot deformities.

Methods:
A pre-algorithm study was first conducted to test the level of concordance between a panel of raters consisting of 4 prosthetists/orthotists and 4 podiatrists. A literature review was then conducted to investigate the orthotic management of PFU and Charcot deformities. An expert panel of prosthetists/orthotists and podiatrists then formulated an evidence-based algorithm after a consensus discussion. The new algorithm was tested on the same 8 raters based on 10 retrospective patient cases.

Results:
There was poor agreement for the appropriate selection of offloading devices before the formulation of the algorithm, K = 0.04 (-0.01-0.09) 95% CI. With the new algorithm, there was a moderate level of agreement K = 0.41 (0.34-0.48) 95% CI.

Discussion & Conclusion:
Management of offloading ulcers and Charcot deformities varies among and within different healthcare professionals. We succeeded in developing an algorithm that allows a moderate level of agreement among clinicians. This tool can be integrated as part of a common pathway in managing this group of complex patients. Further treatment outcomes, such as healing rates, can be investigated in the future with utilisation of the algorithm by the multidisciplinary team.

AH-48

Management of Chronic Diabetic Plantar Forefoot Ulcer with the Modified "Mandakini" Offloading Device for Non-Compliant Patients in an Asian Society: A Case Series Report

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Background & Hypothesis:
Conventional offloading devices (CODs) including removable cast-walkers, wound-care shoes and offloading insoles are commonly used for managing diabetic plantar forefoot ulcers (DPFUs). Limitations of CODs include patient compliance, suitability and cost. Poor compliance to COD has been a major obstacle in healing DPFUs due to the widespread practice of barefoot ambulation in the home environment in most Asian societies such as Singapore. The modified "Mandakini" offloading device (MMOD) made up of nitrile gloves and Mefix tape provides an alternative to CODs where footwear compliance is not a prerequisite.

Methods:
A case series based on 3 consecutive patients were selected for the MMOD intervention between August to December 2015 at the Podiatry Clinic, Foot Care & Limb Design Centre, Tan Tock Seng Hospital. Three patients met the inclusion criteria of DPFU ≥2 months at stage A1 of University of Texas Wound classification; wound size ≤ (2.0 x 2.0 x 0.2) cm, and non-compliant to conventional offloading device ≥2 months. The MMOD was applied proximal to the patients' DPFUs with no footwear compliance required from them. Wound measurements and classifications were taken at every review.

Results:
Patients A, B and C attended a total of 2, 4 and 2 sessions before their DPFUs were fully healed at 2, 5 and 4 weeks respectively.

Discussion & Conclusion:
Patient compliance to offloading devices is crucial in healing DPFUs. Complications for a non-healing DPFU include infection which may lead to a potential limb amputation. This study has shown 3 successful cases of complete wound healing in non-compliant patients treated with the MMOD.

AH-49

Dysfunctional Coping Mediates the Effect of Negative Emotions on Physical Functioning in Cardiac Patients

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Background & Hypothesis:
Coronary heart disease (CHD) is the most common diagnosis in all cardiovascular diseases. Research has demonstrated that CHD patients often experience mental distress, which coincides with more severe physical limitations and complications. Negative emotions may activate dysfunctional coping styles that influence physical functioning. However, few studies have examined whether dysfunctional coping would mediate the influence of negative emotions on physical functioning among CHD patients.

Methods:
A total of 150 CHD patients participating in cardiac rehabilitation completed measures of coping, negative emotions (depression, anxiety, and worry) and physical functioning. Hierarchical regression analyses were conducted to examine the associations between each negative emotion, dysfunctional coping, and physical functioning, and to test whether dysfunctional coping was a mediator between negative emotion and physical functioning. All models were adjusted for covariates, including age, gender, education, and history of CABG and PTCA.

Results:
Depression (β = -0.414, P <0.001), anxiety (β = -0.403, P <0.001) and worry (β = -0.472, P <0.001) each significantly predicted lower physical functioning. Dysfunctional coping significantly accounted for additional variance in physical functioning when added into the model with depression (β = -0.226, P = 0.004), anxiety (β = -0.225, P = 0.004), or worry (β = -0.225, P = 0.003). Bootstrap confidence intervals supported dysfunctional coping as a partial mediator of depression (β = -0.04, 95% CI -0.103,-0.006), anxiety (β = -0.04, 95% CI -0.107,-0.007), and worry (β = -0.04, 95% CI, -0.088,-0.002). Higher depression, anxiety, and worry were associated with more dysfunctional coping, which in turn, was associated with lower physical functioning.

Discussion & Conclusion:
Reducing dysfunctional coping may be an effective adjunctive intervention to alleviate the detrimental impact of negative emotions on physical limitation in CHD patients.

AH-50

Normative Grip Strength Data for Community-Dwelling Older Adults in Singapore and a Comparison with International Norms

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Background & Hypothesis:
Epidemiological studies have reported association between weaker grip strength with mortality and morbidity. However, there are no published normative values of grip strength among the elderly in Singapore. In this study, we aim to produce a normative cross-sectional value for grip strength among older adults aged 60 years and above, and to compare our findings with that from other countries.

Methods:
A total of 2043 community-dwelling older adults from the Well-Being of the Singapore Elderly (WiSE) study completed grip strength assessments. Grip strength was measured using a Jamar hand dynamometer. Normative data were reported in 5-year age groups and were stratified by age groups, gender, and ethnicity.

Results:
The mean grip strengths were significantly greater in the youngest age group (60-64) than the other age groups. Those of Malay and Indian ethnicity had significantly lower grip strength than Chinese after adjusting for other sociodemographic correlates. The mean grip strength for the male and female participants in the youngest age group was 31.1 kg and 18.2 kg respectively while it dropped to 18.4 kg for male and 12.4 kg for female participants in the oldest age group (85+). Grip strength among older adults in Singapore were relatively low compared to other Western and Asian countries except for Taiwan.

Discussion & Conclusion:
Our findings suggest that older adults in Singapore have a relatively weak grip strength compared to other countries. These values showed the importance of clinical assessment of grip strength as it served as an indicator of people who are likely to have mortality and morbidity.

AH-51

The Quality of Life in Children and Adolescents with Autism Spectrum Disorder and Attention Deficit Hyperactivity Disorder

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Background & Hypothesis:
Children and adolescents with psychiatric disorders often experience lower quality of life (QoL) compared to healthy controls. Specifically, children with autism spectrum disorder (ASD) and attention deficit hyperactivity disorder (ADHD) have been reported to have poor QoL in various domains. However, few studies have examined the difference in QoL between individuals with ASD and ADHD. This study examines the QoL of children diagnosed with ASD and ADHD as they age.

Methods:
A total of 160 parents provided information on the QoL of their child on the KIDSCREEEN-27. Demographic information was also collected. Children were aged 7 to 19 years (M = 11.9, SD = 3.25), and were grouped into children (≤12 years, n = 96) and adolescents (≥13 years, n = 64). Fifty-eight had a primary diagnosis of ASD and 102 had a primary diagnosis of ADHD.

Results:
Children and adolescents with ASD showed significantly lower QoL in the social support and peers domain compared to those with ADHD ($F_{(1, 158)} = 17.67$, $P < 0.01$). Adolescents were reported to have lower QoL in the physical ($F_{(1,158)} = 22.7$, $P > 0.01$) and psychological domain ($F_{[1, 158]} = 4.55$, $P = 0.03$).

Discussion & Conclusion:
Unsurprisingly, individuals with ASD were reported to have a lower QoL in the social support and peers domain compared to those with ADHD. Interestingly, adolescents were found to have lower QoL than children. While adolescence is a developmental stage which is often associated with heightened stress and emotional reactivity, factors that impact QoL of adolescents need further exploration. Adolescents with ASD or ADHD can benefit from more support to promote better well-being.

AH-52

Emotion Dysregulation as a Mechanism Linking Child Maltreatment and Deliberate Self-Harm in Adolescents

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Background & Hypothesis:
The link between child maltreatment (CM) and deliberate self-harm (DSH) is well-established. Developmental perspectives of DSH postulate that DSH functions as a compensatory strategy to regulate overwhelming emotions. The study aims to test this regulatory pathway hypothesis in a sample of adolescents presenting for treatment at the Institute of Mental Health, Singapore.

Methods:
Participants were 108 adolescents (mean age 17.0 years, SD = 1.65, range: 14 to 19 years; 59.3% female). CM was measured by the Childhood Trauma Questionnaire (CTQ-SF), emotion dysregulation was measured by the Difficulties in Emotion Regulation Scale (DERS), and DSH was measured by the Functional Assessment of Self-Mutilation (FASM). Multiple regression analyses were conducted to examine if emotion dysregulation mediates the association between CM and DSH frequency.

Results:
Overall, 38% of the sample had primary diagnoses of mood disorders, 18.5% anxiety disorders, 18.5% adjustment disorders, and 25% had other diagnoses. Results showed that emotion dysregulation mediated the association between CM and DSH. Specifically, the initial association between CM and DSH (b = 0.33, P <0.001) became non-significant after the inclusion of emotion dysregulation (b = 0.07, P <0.001), with adjustments for age, gender, ethnicity, and education, R^2adj = 0.41, F(8, 91) = 9.44, P <0.001.

Discussion & Conclusion:
Consistent with the regulatory pathway hypothesis, emotion dysregulation may be a potential mechanism linking CM experiences and DSH among adolescents. Emotion regulation skills may be an important intervention target in addressing adolescent DSH. Findings from the study have implications for the prevention and treatment of DSH in maltreated youths.

AH-53

Effectiveness of Orthotics in Improving Foot Posture Index and Reported Pain Scores for Patients Referred to a Podiatry Biomechanics Clinic

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Background & Hypothesis:
Orthotics such as prefabricated or customised insoles has been applied in the management of lower limb disorders and pain. Abnormal foot postures have been related to certain conditions such as plantar fasciitis and patellofemoral syndrome. The aim of this study is to investigate the effectiveness of orthotics management in improving Foot Posture Index (FPI) and pain levels in patients with lower limb disorders.

Methods:
Retrospective data was reviewed for 159 patients who presented to the Podiatry Biomechanics Clinic at Foot Care & Limb Design Centre, Tan Tock Seng Hospital, between October to December 2015. Data retrieved included demographic details, types of intervention and, pre- and post-FPI and reported pain scores. Patients were managed with either prefabricated (42%) or customised insoles (35%), advice and stretches only (18%) and other orthotic devices (5%).

Results:
There were no correlations seen across age, gender and ethnicity. Pre-FPI scores shows 32% were within normal limits, 42% pronated, 23% highly pronated and 3% supinated. Mean patient reported pain levels were 5.80 (SD 2.34) out of a score of 10. Postintervention FPI showed significant improvement with 93% of patients achieving normal scores ($P < 0.001$), and mean pain levels of 3.65 (SD 2.62), $P < 0.001$.

Discussion & Conclusion:
Orthotics is commonly used to correct static and dynamic foot postures to allow for normal loading of the lower limb structures. This study has shown good outcomes reported in patients' pain levels and FPI scores. Busy clinics may find pain scores and FPI as a rapid, non-invasive, reliable tool to help track the outcomes of their patients.

AH-54

The Efficiency of Short Messaging Services in Improving Outpatient Attendance in Patients with Psychotic Illness in a Community Wellness Clinic

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Background & Hypothesis:
High rates of missed appointments and compliance attrition are common barriers to treatment for patients with psychiatric conditions attending outpatient mental health services. Several studies have looked at using short message service (SMS) reminders to improve outpatient attendance with physical illnesses. Our study was to look at the efficiency of SMS in a small subgroup of psychiatric patients diagnosed with a psychotic illness.

Methods:
Patients who consented for receiving SMS were reminded 3 days in advance of their appointment day and time. Retrospective data was collected regarding outpatient attendance for patients with psychotic illness who received reminders as opposed to those who did not receive any reminders.

Results:
From January 2016 to May 2016, 222 patients with the diagnosis of schizophrenia and delusional Disorder were surveyed. A total of 121 patients were on SMS reminder and 99 patients attended outpatient appointment. Of the 101 patients without SMS reminders, 63 patients attended outpatient appointment. Non-attendance was 20% lower in patients who received SMS reminders than patients who did not receive a reminder.

Discussion & Conclusion:
The use of SMS reminders for psychiatric outpatient appointments has shown to have better outcomes in patients compared to patients with no appointment reminders.

AH-55

Effectiveness of Customised Scoliosis Bracing in Improving In-Brace Corrections for Adolescents with Idiopathic Scoliosis

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Background & Hypothesis:
Adolescent idiopathic scoliosis (AIS) is a complex spinal deformity that affects 2-3% of otherwise healthy teenagers. The deformity may progress during growth spurts and affects health-related quality of life. Curves with Cobb angles between 25- 45° can be braced. This retrospective study aims to determine the effectiveness of scoliosis bracing for AIS patients.

Methods:
Retrospective data was reviewed for patients fitted with scoliosis braces at the Foot Care and Limb Design Centre (FLC), Tan Tock Seng Hospital, between April 2014-2015. These thoracic-lumbar-sacral orthoses (TLSOs) based on the Boston Brace System were generated from torso models created by the Vorum Canfit software using patient measurements. Curves were grouped by their augmented Lehnert-Schroth classifications. Cobb angles and percentage in-brace corrections were calculated from pre- and in-brace radiographs and compared to the Boston Brace International Standards.

Results:
A total of 83 braces were fitted; 56 patients had in-brace radiographs. No in-brace radiographs were available for 27 patients. S-shaped curves had the lowest in-brace correction, averaging 8.72% for thoracic curves and 18.74% for lumbar curves. Correction for C-shaped curves ranged from 14.95-49.47%, with curves with apices from T12-L3 showing the largest average correction (43.52-49.47%). FLC braces met or exceeded international standards for thoracolumbar and lumbar curves.

Discussion & Conclusion:
The TLSOs were effective in treating curves with apices from T12-L3. Insufficient in-brace counterforce at the axilla reduced brace effectiveness to half that of international standards in curves with apices proximal to T12 and will require more investigation into brace measurement and manufacturing techniques.

AH-56

Factors Influencing Teenagers' Choice of Living With and Caring for Ageing Parents in the Future

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Background & Hypothesis:
The Singapore General Household Survey in 2015 showed a 7% (69% to 62%) decrease in seniors staying with their children compared to 2005. This study explores the factors that influence teenagers' decision to live with and care for their ageing parents in the future.

Methods:
A total of 1405 teenage students (Mage = 14.9 ± 1.30) attending a school's outreach programme on ageing and dementia answered a purpose-designed questionnaire comprising 4 questions regarding the quality of their relationship with grandparents and 10 Likert-scaled statements about their perception towards ageing. Univariate analysis and logistic regression were performed to evaluate factors that influenced their decisions on staying with and caring for their parents.

Results:
Majority of the students (83.1%) chose to stay with their parents in the future and having a positive perception of seniors as wise increased the likelihood (β = 0.579, OR = 1.78, 95% CI = 0.110-1.05). However, negative perceptions of seniors as stubborn (β = -0.503, 95% CI = -0.820 – -0.187) as well as not seeing grandparents on a daily basis (β = -0.450, 95% CI = -0.775 – -0.126) were associated with lower probability of choosing to stay with parents. The model containing these 3 factors was statistically significant, χ^2 (3, n = 1335) = 24.1, P <0.001.

Discussion & Conclusion:
The study has identified key factors that shape teenagers' impressions on future care of their parents. If the family is to continue to be the social safety net for more frail seniors in the future, efforts to nurture positive attitudes of the young towards seniors and foster closer ties are necessary.

AH-57

Macroprolactinaemia: How Common is it?

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Background & Hypothesis:
Diagnosis of hyperprolactinaemia is confounded by macroprolactin, and most laboratories screen for macroprolactin interference by polyethylene glycol (PEG) precipitation. We reviewed prolactin results in the National University Hospital to determine the incidence and risk factors for macroprolactinaemia.

Methods:
All prolactin requests from April 2015-April 2016 were reviewed. For patients with repeated requests, the earliest result was used for analysis. Prolactin was analysed on Beckman DxI 800 platform, with prolactin results above the gender-specific reference range being treated with PEG. The percentage recovery post-PEG was used to determine presence of macroprolactin ($\leq$40%). Statistical analysis was performed using Microsoft Excel.

Results:
Of 3924 prolactin requests, 288 were above reference range (68% females and 32% males, with median age of 36 and 51, respectively); 5.6% of female patients (27% Malays, 64% Chinese and 9% Other ethnic group) and 7.6% of males (100% Chinese) had macroprolactinaemia, with median age of 32 and 38 years old, median prolactin concentrations of 712 and 392 U/ml; 88% of females and 83% of males had true hyperprolactinaemia (recovery of $\geq$60), with median age of 36 and 63 years old, and median concentrations were 908 and 481 U/ml; 34% of female hyperprolactinaemia had clinically diagnosed pituitary adenoma with median prolactin concentration of 1076 U/ml; 13% were due to antipsychotic medications with median concentration of 1496 U/ml.

Discussion & Conclusion:
Macroprolactinaemia was relatively common and associated with younger age and lower prolactin concentrations. Female patients with pituitary adenoma had lower prolactin concentrations than those on antipsychotics, possibly as they were already on medical treatment.

AH-58

Sensory Processing Differences among Children with Different Mental Health Conditions

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Background & Hypothesis:
Sensory processing problems are commonly reported in children diagnosed with autism spectrum disorder (ASD) and attention deficit hyperactivity disorder (ADHD). However, the specific differences in sensory processing of these children, compared to children with other mood and anxiety conditions (MA) and the typically-developing children (TD) are not well-studied. We aim to explore the differences using the short sensory profile (SSP).

Methods:
Caregivers of children aged 4 to 18 (M = 11.03, SD = 5.54) who had attended the Student Health Centre (n = 226) and the Child Guidance Clinic (n = 116) participated in the study. They completed SSP and provided demographic information on their child.

Results:
Children with a clinical diagnosis reported more sensory issues based on the SSP total scores with ADHD population (M = 140.39, SD = 21.62) having the lowest scores followed by ASD (M = 144.97, SD = 18.29), MA (M = 153.08, SD = 27.77), then TD (M = 155.02, SD = 22.29). A MANOVA revealed differences in SSP scores specifically in the domains of Underresponsive/Seeks Sensation, Auditory Filtering, and Low Energy/Weak.

Discussion & Conclusion:
Compared to the typically-developing population, children with mood and anxiety conditions did not present with significant sensory processing issues. Interestingly, children with ADHD were reported to present more problems in their sensory processing than children with ASD, specifically in the areas of Underresponsive/Seeks Sensation and Auditory Filtering. SSP appears to be a useful tool to identify possible areas of intervention for children with ASD and ADHD.

AH-59

Clinical Outcomes of Interpersonal Social Rhythms Therapy (IPSRT) on Bipolar Patients

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Background & Hypothesis:
IPSRT is based on the concept that individuals with bipolar disorder can work with a therapist to make changes in their schedules and social and interpersonal routines in the service of developing "supranormal" regularity in their daily rhythms which can reduce their mood symptoms and risk of manic or depressive recurrence. We hypothesise that IPSRT will help bipolar patients reduce their symptoms by being aware of their social rhythms.

Methods:
Six male patients diagnosed with bipolar disorder participated in an ongoing 12-week IPSRT group therapy run on an outpatient basis by the Case Manager. The topics included psychoeducation about bipolar, social rhythm metric and goal setting, illness history timeline, sleep hygiene and interpersonal relationships. Scales used to track patients' progress included the Patient Health Questionnaire (PHQ-9) and the Altman Self-Rating Mania Scale (ASRM).

Results:
Out of the 6 patients, 3 patients were 100% compliant in sessions. The results of PHQ-9 reflected that depressive symptoms were more prominent at the commencement of the therapy. However, the symptoms improved at the 9th session as follows: Patient A decreased by 91%, Patient B by 71%, Patient C by 60%. Overall decrement for the 3 patients is 21%. ASRM revealed that mania symptoms decreased in Patient C by 40% and showed minimal decrement for Patients A and B. Patient C decreased by 40%. Overall decrement for 3 patients is 15%.

Discussion & Conclusion:
IPSRT is as an effective therapy to help bipolar patients manage their mood. Future research could explore how to improve the effectiveness of IPSRT in bigger groups.

AH-60

Effects of Sleep on Health-related Quality of Life in Patients with Coronary Heart Disease

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Background & Hypothesis:
Sleep problems have been associated with adverse health outcomes and are common in patients with coronary heart disease (CHD). This study examined the measurement structure of the Pittsburgh Sleep Quality Index (PSQI) and its concurrent and prospective associations with health functioning in physical, social, and emotional domains among CHD patients.

Methods:
A total of 167 CHD patients (mean age = 63.3) completed the PSQI and CHD-specific quality of life questionnaire, and 109 of them also completed 3-month follow-ups. Confirmatory factor analysis (CFA) was used to evaluate the one-, two-, and three-factor structure of the PSQI based on previous literature. Structural equation modelling (SEM) was used to examine the relationship between sleep dimensions and health functioning domains. All models were adjusted for demographic covariates.

Results:
CFA results revealed that measurement structure with 2 factors, sleep efficiency and perceived sleep quality, best fitted the data, $\chi^2(8) = 14.01$, $P = 0.082$; CFI = 0.98; RMSEA = 0.07. SEM analysis showed that higher sleep quality significantly predicted concurrent emotional ($\beta = -0.47$, $P < 0.001$), physical ($\beta = -0.44$, $P < 0.001$), and social ($\beta = -0.34$, $P < 0.001$) functioning. Higher sleep quality also predicted improved physical ($\beta = -0.15$, $P = 0.048$) and social ($\beta = -0.17$, $P = 0.034$) functioning, but not emotional ($\beta = -0.07$, $P = 0.349$) functioning, 3 months later, while controlling for respective baseline and standard covariates. Sleep efficiency did not predict any of these domains.

Discussion & Conclusion:
Improving sleep quality is vital to enhancing physical and social health functioning in cardiac patients.

AH-61

Establishing the Cutoff Values on the Social Responsiveness Scale in Singapore

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Background & Hypothesis:
In Singapore, the Social Responsiveness Scale (SRS) is often used as a screening tool for autism spectrum disorders (ASD). Based on the manual, cutoff values of 70 and 65 were recommended for use with the general population for males and females respectively, while a value of 85 was recommended for use in clinical settings. In order to improve screening processes in Singapore for more accurate identification of ASD, this study aims to establish SRS cutoff values based on local standards.

Methods:
Responses on the SRS and demographic information were collected from the caregivers of 392 children and adolescents, aged between 4 and 18 years old (M = 10.44, SD = 3.84). These children and adolescents attended either the Child Guidance Clinic or the Student Health Centre.

Results:
A total of 41.3% (n = 162) of the total sample received a psychiatric diagnosis (27.2% ASD, 72.8% others), while 58.7% (n = 230) did not report any psychiatric history. Using the receiver operating characteristic (ROC) analysis, optimal cutoff values of 80 (AUC = 0.798, sensitivity = 0.667, specificity = 0.853) and 82 (AUC = 0.815, sensitivity = 0.625, specificity = 0.886) were obtained for males and females respectively. For use within clinical settings, an optimal cutoff value of 80 (AUC = 0.708, sensitivity = 0.659, specificity = 0.737) was obtained.

Discussion & Conclusion:
Cultural differences in the way parents read, interpret, and report their children's behaviours could possibly explain these differences in cutoff values. These differences may also be manifested in the form of parental expectations towards gender-appropriate behaviours. Future studies can consider comparing different samples beyond Singapore to make the tool more cultural-sensitive and applicable in the Asian context.

AH-62

Inpatient Model of Care to Effect Sustainable De-Prescribing

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Background & Hypothesis:
De-prescribing entails an extensive review, discussion and documentation about medication plans and this process is labour and time consuming. Hence, this study aims to develop a sustainable model of care for effective de-prescribing to be integrated seamlessly in an acute setting.

Methods:
A build-measure-learn feedback loop was used to design, implement and reiterate 2 prototypes for pharmacist-initiated de-prescribing. After interviewing and reviewing the medication, pharmacists will discuss with the physicians on the de-prescribing plan. Iterations of the workflow involved streamlining the method for identification of patients, documentation process, and evaluation of medication. The prototype was modified based on number of patients recruited, time spent, number of medications de-prescribed and feedback from pharmacist survey.

Results:
Two prototypes were built. The mean number of patients recruited increased from 4.6 (Prototype 1) to 17.5 (Prototype 2). The mean number of interventions per week increased from 9.1 (Prototype 1) to 34.8 (Prototype 2), with 76% of the medications de-prescribed due to "no active indication of drug". The pharmacist surveys showed an improvement of pharmacists' perception on sustainability in terms of time required, from an average response of 3.25 (Prototype 1) to 4.0 (Prototype 2).

Discussion & Conclusion:
The final prototype allowed the sustainable integration of de-prescribing in the acute care through the collaboration of pharmacists and physicians. The workflow was also modified sufficiently to enable de-prescribing of unnecessary medication.

AH-63

Behavioural Outcomes of Children in an Outpatient Psychiatric Clinic: A Cohort Study

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Background & Hypothesis:
Longitudinal outcomes of patients receiving psychiatric treatment are not well-studied, especially in children and adolescents. With a cohort study design, we aim to examine outcomes of children and adolescents who have attended an outpatient psychiatric clinic in Singapore, using the Child Behaviour Checklist (CBCL) at 1 or 2 years follow-up.

Methods:
Parents of 207 children aged 6 to 17 (M = 10.06, SD = 3.21) filled in CBCL parent-reports during their first visit and at 1-year or 2-year follow-up. Information on participants' visits was obtained from clinical records.

Results:
Participants followed up after 1 (n = 95) and 2 years (n = 112) did not differ in CBCL scores, age, gender, diagnoses and severity at baseline. They demonstrated improvement in Total Problems scores at 1-year follow-up (t(94) = 2.78, P = 0.007) and improvement was consistent on the Reliable Change Index (z = -2.61). Improvement was maintained at 2-year follow-up. Participants who did not return for treatment during the second year reported more improvement in Total Problems scores (t[110] = -2.09, P = 0.039). They also made fewer visits to the clinic over the year (t[110] = 4.90, P <0.001) and were less likely to be prescribed medication (X_2 [1] = 4.44, P = 0.035).

Discussion & Conclusion:
Our findings suggest maintenance in improvement 2 years after treatment. Although treatment frequency and prescription of medication are negatively correlated with improvement, the relationship between these factors requires further investigation. Other factors that influence improvement in outcomes should be examined.

AH-64

Reducing 30-Day Readmission Rates through Enhanced CM Interventions

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Background & Hypothesis:
The rate of hospital readmission within 30 days of discharge has been internationally used as a benchmark for quality of care, hence efforts have focused on reducing the rates of these unplanned readmissions. A study done by an acute psychiatric ward in IMH showed that its 30-day readmission rates had risen from 14.4% in 2013 to 20% in March 2015. Therefore, a project was initiated in 2015 with an aim to reduce 30-day readmission rates by 50%.

Methods:
A survey was done with patients who had been re-admitted within 30 days, and 3 contributing factors for readmission were identified. They were: 1) lack of knowledge of information regarding community support; 2) insufficient outpatient support; and 3) patient who does not know where to seek help. An intervention for each contributing factor was developed and implemented in phases. The 3 interventions were: 1) patients were provided linkages to the right community supports during their admission to ward; 2) Case Manager (CM) provided face-to-face support for patient during their postdischarge outpatient appointments, and also conducted additional supportive phone calls to patient in between the mandatory postdischarge and appointment reminder phone calls; and 3) CM provided psychoeducation and reiteration of possible community support to patients when they come into emergency room for social issues.

Results:
Results collated in October 2015 showed that the interventions successfully reduced the ward's 30-day readmission rates which had decreased by 50%, to 10%.

Discussion & Conclusion:
Results of the project suggest that patients benefit greatly enhanced CM support and can be implemented in other wards.

AH-65

Exploring Response to Postdischarge Call as Indicator of First TCU Attendance

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Background & Hypothesis:
Postdischarge calls conducted by case managers are the first contact made to patients within 48 hours after their discharge. Patient's response to postdischarge call might indicate subsequent compliance to treatment regime. Thus, the hypothesis is that patients who were uncontactable would be more likely to default their first TCU attendance.

Methods:
Seventy-four female outpatients diagnosed with either schizophrenia, schizoaffective, acute psychosis and who were discharged from the Institute of Mental Health (IMH) Ward 32B from October 2015 to March 2016 were identified. Patients subsequently managed by other private psychiatrists or general hospitals were excluded from the study. Subjects were characterised according to [Group A] those who were uncontactable via postdischarge call (n = 33) and [Group B] those who were (n = 33). Patients who returned their missed postdischarge call were considered under "call answered". The percentage of patients who defaulted their first TCU in each group was compared.

Results:
It was found that the percentage of first TCU default in Group A was higher than the percentage of first TCU defaults derived from Group B (6.06%; 2 of 33 vs 0%; 0 of 33, respectively).

Discussion & Conclusion:
Based on the results shown, schizophrenia, schizoaffective or acute psychosis-diagnosed female patients are more likely to default their first TCU when they are uncontactable during postdischarge call. The difference obtained in the results proves the need for future studies to explore other further interventions, for example, more frequent follow-up calls apart from TCU reminders, for these patients who do not answer postdischarge calls.

AH-66

Identification and Management of Refeeding Syndrome (RFS) in an Acute Care Hospital

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Background & Hypothesis:
Early identification of RFS is necessary to prevent and treat metabolic disturbances associated with RFS. Although the National Institute for Health and Clinical Excellence (NICE) guideline on RFS is widely used, there is limited information on its application in the Singapore context. We aim to examine the current practice of doctors and dieticians in identifying and managing RFS.

Methods:
Eligible participants were adult inpatients in 6 medical wards, reviewed and identified by dieticians as "At Risk of RFS" over a 3-month period. Data was collected as part of a quality improvement initiative.

Results:
Forty-four patients were identified, of which 4.5% were identified by the primary team before dietetic consultation. All cases fulfilled NICE RFS criteria, with "little or no nutritional intake for >10 days" (72.7%), "BMI less than 16 kg/m^2" (56.8%) and "low levels of potassium, phosphate or magnesium prior to feeding" (54.5%) being the top 3 reasons. Thiamine supplementation was initiated in 2.3% of patients before dietetic consultation. Of the remaining cases, dieticians recommended 88.3% to be started on thiamine (55% were started within 24 hours; 21% not supplemented). Potassium levels were monitored in all cases and 75% had low levels (87.8% replaced). In cases where phosphate and magnesium levels were checked (91%), 55% had low magnesium (13.6% not replaced) and 52.5% had low phosphate (23.8% not replaced).

Discussion & Conclusion:
Identification of RFS is not consistent between doctors and dieticians, therefore implementation of hospital-wide guidelines and strategies to increase awareness of RFS may facilitate better identification and management of at-risk patients.

AH-67

Schizotypal Personality and Aggression in Children and Adolescents with Externalising Disorders

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Background & Hypothesis:
Schizophrenia is associated with violence. As early schizotypal personality traits, or "schizotypy", are risk factors for schizophrenia, there is recent interest in studying the relationship between schizotypy and aggression in children. One study showed that schizotypy was associated with aggression amongst non-clinical adolescents. However, no studies to date have investigated this schizotypy-aggression relationship in a clinical population. Given that individuals with externalising disorders (EDs) display elevated aggression and a higher risk of developing personality disorders, it would be of clinical relevance to explore this relationship in the clinically referred with EDs. This study aims to explore the schizotypy-aggression relationship in children with EDs. It is hypothesised that schizotypal traits will predict aggression.

Methods:
A total of 282 children aged 7 to 16 years old with clinical diagnoses of EDs were recruited. Participants completed the Schizotypal Personality Questionnaire (SPQ) [Subscales: Cognitive-Perceptual, Interpersonal, Disorganized] and Reactive Proactive Questionnaire (RPQ) [Subscales: Reactive Aggression, Proactive Aggression].

Results:
Stepwise regression analyses showed that interpersonal features predicted reactive aggression (RA). For proactive aggression (PA), disorganised and cognitive-perceptual features were significant predictors.

Discussion & Conclusion:
Interpersonal deficits may result in more negative peer experiences causing them to react aggressively. Contrary to literature, disorganised and cognitive-perceptual features were significant predictors. Disorganised speech and behaviours make it difficult for them to express their needs, resulting in the use of PA to get what they want. Cognitive-perceptual deficits may lend to erroneous beliefs about the self or others that justifies engaging in PA. Further research can explore how EDs and schizotypy interact to give rise to PA and RA.

AH-68

The Efficacy of a Gravity-assisted Upper Limb Device on Stroke Patients with Moderate to Severe Arm Paresis in an Outpatient Rehabilitation Setting: A Comparison between Two Clinical Programmes

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Background & Hypothesis:
Armeo® Spring (AS) is an effective tool for rehabilitating poststroke arm motor impairment. This study compares the efficacy of 2 combinatory programmes (AS and conventional therapy [CT]) of varying duration on standardised outcome measures.

Methods:
This was a retrospective study. Two programmes evaluated included: [P1] total 18 sessions (12 AS + 6 CT) and, [P2] total 28 sessions (16 AS + 12 CT). Outcome measures included Fugl Meyer Motor Assessment (FMM), Action Research Arm Test (ARAT), measured at baseline, post-AS and post-CT.

Results:
A total of 48 patients, n = 27 [P1] & n = 21 [P2] were included. For both the programme's baseline mean, age: 56; and scores for FMM: 18.5; ARAT: 5 respectively. On comparing the efficacy, i.e. the duration of an intervention of P2 with P1, there was no significance difference in the FMM and ARAT scores as (P >0.05). Though, there was a tendency toward larger gains in [P2], mean FMM 4.81 [P1] vs 6.67 [P2] and ARAT 1.3 [P1] vs 4.81 [P2]. However, within [P1] & [P2] post-CT, FMM and ARAT were statistically significant (P <0.05). In addition, there was a positive correlation between FMM and ARAT scores for both programmes.

Discussion & Conclusion:
The shortcomings of this study included a lack of randomisation and short follow-up period. An increase in total duration of a combinatory programme did not result in significant differences in FMM and ARAT as intensity was similar. Future studies are still needed to determine optimal dosage for AS and CT on the subacute to chronic stroke population.

AH-69

Estimation of Prevalence of Osteoporosis Using OSTA and its Correlation with Disability and Comorbidities

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Background & Hypothesis:
We aimed to: 1) estimate the proportion of older adults who had a risk of developing osteoporosis, and 2) explore the correlates of osteoporosis, including its relationship with chronic medical conditions and disability.

Methods:
This cross-sectional study included 2565 participants aged ≥60 years who were representative of Singapore's multi-ethnic population. The data was drawn from a national survey on the older adults in Singapore. We used the Osteoporosis Self-Assessment Tool for Asians with a score of ≤-1 to classify participants as "at risk" of osteoporosis. Data on sociodemographic characteristics and chronic medical conditions were collected through self-report, while severity of disability was measured by World Health Organisation Disability Assessment Schedule.

Results:
The overall estimated proportion of participants who were at risk of osteoporosis was 52%. Older adults aged 75-84 years old (15.6 times), females (15.6 times), and those who were never married (2.2 times) or widowed (1.9 times), with lower education (2.8 times) or retired (1.7 times) were at a significantly higher risk of osteoporosis. Older adults with diabetes or hypertension were both less likely to be at risk of osteoporosis.

Discussion & Conclusion:
The estimated proportion of 52% translates to about 278,000 older adults who are at risk of osteoporosis. Those with diabetes and hypertension were found to have a reduced risk of osteoporosis. The association of type 2 diabetes with being overweight and the protective effects of commonly prescribed antihypertensive medication may have a positive effect on bone mass density. Further research is needed in understanding the risk and protective factors associated with osteoporosis.

AH-70

Association between Trunk Control and Recovery of Upper Limb in the First 6 Months Poststroke

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Background & Hypothesis:
Impaired trunk control is commonly observed following stroke. Our recent cross-sectional study [Wee et al (2015) Physical Therapy 95(8):1163-1171] has demonstrated a strong association between trunk control and upper limb (UL) function in stroke patients. This longitudinal study aims to evaluate the association between trunk control and recovery of UL in the first 6 months poststroke.

Methods:
Forty-five subacute stroke patients were recruited. Trunk control was assessed using Trunk Impairment Scale (TIS). UL impairment and function were assessed with Fugl-Meyer (FMA) and Streamlined Wolf Motor Function Test (SWMFT) respectively. Participants were assessed once a month till 6 months poststroke. Individual growth curve (IGC) modelling technique was used to analyse the intra-individual and inter-individual changes over time.

Results:
The IGC results demonstrated that the most rapid recovery of trunk control and UL occurred in the first 3 months followed by a deceleration in the rate of recovery from 4th to 6th month poststroke. The rate of change (determined by the slope at each time point) of the recovery curves of trunk control and UL impairment was found to be similar over time. As TIS scores improved over time, both UL impairment and function improved almost in parallel with TIS increase. A better degree of trunk control was associated with a better recovery of UL.

Discussion & Conclusion:
Trunk control has an association with recovery of UL impairment and function in the first 6 months poststroke. Hence, improving trunk control has the potential to facilitate better recovery of UL in stroke patients.

AH-71

Effect of Diabetes Knowledge and Self-Efficacy on Self-Care Activities in Patients with Type 2 Diabetes

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Background & Hypothesis:
Self-care activities are essential for management of type 2 diabetes mellitus (T2DM). This study examined whether self-efficacy and diabetes knowledge were associated with various components of self-care activities and whether self-efficacy mediated the relationship between diabetes knowledge and self-care activities.

Methods:
Participants were 53 adults with T2DM (M = 60.7 years old) who completed measures of diabetes self-efficacy, diabetes knowledge, and self-care activities (general diet, specific diet, exercise, blood glucose testing, foot care and adherence to medication).

Results:
Results from hierarchical regression analysis indicated that self-efficacy ($\beta = 0.43$, *P* <0.01) and diabetes knowledge ($\beta = 0.33$, *P* <0.05) individually predicted overall self-care activities, while controlling for age, gender, socioeconomic status, body mass index, hypertension, cardiovascular disease and insulin medication. Specifically, diabetes knowledge significantly predicted foot care ($\beta = 0.42$, *P* <0.01) but not general diet ($\beta = -0.002$, *P* >0.05), specific diet ($\beta = 0.14$, *P* >0.05), exercise ($\beta = 0.20$, *P* >0.05), blood glucose testing ($\beta = 0.20$, *P* >0.05), and adherence to medication ($\beta = 0.01$, *P* >0.05). Self-efficacy significantly predicted general diet ($\beta = 0.37$, *P* <0.05), foot care ($\beta = 0.41$, *P* <0.01), exercise ($\beta = 0.31$, *P* <0.05), and blood glucose testing ($\beta = 0.29$, *P* <0.05) but not specific diet ($\beta = 0.15$, *P* >0.05) nor adherence to medication ($\beta = 0.02$, *P* >0.05). However, diabetes knowledge did not predict self-efficacy ($\Delta R^2 = 0.001$, *P* >0.05), and therefore self-efficacy did not mediate the effect of diabetes knowledge on self-care activities.

Discussion & Conclusion:
Relative to diabetes knowledge, self-efficacy appeared to be associated more strongly with various domains of self-care activities, suggesting that promoting self-efficacy may improve T2DM patients' self-care behaviour.

AH-72

Reducing Fentanyl Medication Errors

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Background & Hypothesis:
Fentanyl ranked second among drugs involved in medication errors in Khoo Teck Puat Hospital, according to electronic hospital occurrence reports (EHORs) from January 2014 to June 2015. It is a high alert medication, with potential to cause grievous harm when used erroneously. This warrants action to prevent similar errors from reoccurrence. This project aimed to bring about interventions to mitigate gaps in the process chain of Fentanyl that had contributed to errors. The goal was to achieve a reduction in Fentanyl administration errors.

Methods:
Efforts were focused on the administration stage, at which all Fentanyl errors had occurred, and root cause analysis (RCA) was done to identify gaps in current processes. A Fentanyl administration chart was conceived to reduce administration errors. Means to evaluate our intervention include EHOR surveillance, "Ask-5-Take-5" survey, a postintervention quiz and an administration chart survey.

Results:
Since implementation of the chart in October 2015, no Fentanyl administration errors have occurred as of March 2016. Comparatively, the preceding 18 months had a total of 15 Fentanyl errors. All "Ask-5, Take-5" patients were administered Fentanyl correctly, and 20% more nurses were able to arrive at the correct administration rate of Fentanyl with the chart. Finally, a nursing survey revealed positive reception towards our intervention and the majority (95.7%) agreed with its potential to reduce Fentanyl medication errors.

Discussion & Conclusion:
This intervention was largely successful in reducing Fentanyl medication errors. However, more can be done to prevent prescribing and pharmacy-supply related errors, as well as other medication errors.

AH-73

The Effectiveness of Case Management Support for Patients with Treatment-resistant Depression

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Background & Hypothesis:
At the Institute of Mental Health (IMH), case management (CM) service was introduced in Affective Disorders Services (ADS) to coordinate and support patients under the 1-year programme. This paper aims to establish if frequent telephonic support (weekly and fortnightly) to patients with treatment-resistant depression will have a positive outcome.

Methods:
Data mining of patients with treatment-resistant depression discharged from ADS after a year of treatment from November 2011 to June 2016 was done. The Hamilton Rating Scale for Depression (HAM-D) was used during patients' treatment under ADS. HAM-D scores were collected and compared when patients were first assessed by ADS team and discharged from ADS.

Results:
Twenty-two patients with treatment-resistant depression, between the age of 23 to 62, completed the 1-year programme under ADS with intensive case management, males (n = 8) and females (n = 13). They were provided with psychoeducation, supportive counselling, telephonic support on a weekly or fortnightly basis, and meet-ups at the clinic. Results indicated that 63.6% of the patients with treatment-resistant depression showed more than 76% improvement in their HAM-D scores.

Discussion & Conclusion:
CM service has shown to be effective for patients with treatment-resistant depression under ADS. With intensive CM service, patients are closely monitored for deterioration of their condition which allowed them to receive treatment as soon as possible.

AH-74

Sociodemographic Factors and Emotional/Behavioural Characteristics of Victims in a Forensic Population in Singapore

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Background & Hypothesis:
Research has identified victim-specific characteristics like female, disability, low maternal education and divorce. Victims of abuse also often present significant emotional-behavioural difficulties (e.g. depression, somatic complaints and anger). Little is known about the sociodemographic factors and emotional-behavioural characteristics in our local victim population. A clear understanding lays the foundation to better research and provision of help clinically. Woo et al (2007) reported that 12.5% of Singaporean children experienced emotional/behavioural problems. The prevalence rate of internalising and externalising problems are 12.2% and 4.9% respectively. We hypothesise that children in this vulnerable population will experience higher rates.

Methods:
Retrospective data were collected from the case notes of 70 victims in a Singapore outpatient child psychiatric clinic between 2011-2012. They were referred for a forensic assessment to determine their fitness to give evidence in court. A total of 72.9% were victims of child abuse. Data were coded from the clinic assessment form and 41 available Child Behaviour Checklist.

Results:
Sociodemographic variables (gender, learning/speech difficulties, parental marital status and education, etc.) will be reported in the poster; 14.6% of these children reported emotional/behavioural problems; 19.5% and 9.8% faced internalising and externalising problems respectively. T-tests revealed that scores for somatic complaints, delinquent behaviour, social, thought and attention problems were significantly higher than the established prevalence for girls. For boys, only delinquent behaviour was significantly different.

Discussion & Conclusion:
Victims, especially girls, display more socio-emotional difficulties than the local population. Future assessments and interventions should have an increased focus on delinquency. Better understanding of their needs can provide more informed assessments and tailored help.

AH-75

Reducing Prescription Errors in Institute of Mental Health (Clinic B)

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Background & Hypothesis:
A quality improvement project was undertaken by staff from IMH Pharmacy to determine the baseline level of prescription errors (PEs) and their root causes in outpatient Clinic B. The multidisciplinary team of pharmacists, doctors, nurses and pharmacy technicians seek to identify potential areas of improvements to reduce PEs by 70% within 6 months.

Methods:
Possible root causes of PEs were identified and significant ones ranked using an Ishikawa diagram and Pareto principle respectively. The following interventions were implemented after some small scale testing using the Plan-Do-Study-Act approach: 1) a handy iPharm guide with step-by-step screenshots of each type of order entry was printed for doctors in every consult-room; 2) on demand one-on-one hands-on physician training on specific areas in iPharm by pharmacist; and 3) a testing platform for physicians to practise at their convenience; and 4) software enhancement to highlight active medication screen.

Results:
PEs per 1000 prescriptions were measured weekly. After 3 interventions, the team achieved 34% reduction of mean PEs from pre-intervention period of 11.7 per 1000 prescriptions to postintervention period of 7.7 per 1000 prescriptions.

Discussion & Conclusion:
Unfamiliarity with prescribing software likely contributed to an increase in PEs during the 6-monthly changeover of Medical Officers. Similarly, error rate increased when some prescribers were unaware of changes made to iPharm ordering instructions for liquid medications. Prescribing and dispensing the correct medication were the primary targets of this project. Interdisciplinary collaboration to reduce PEs and rework for correcting errors saved cost to the organisation and improved staff satisfaction. This established a culture of safety within the institution.

AH-76

The Application of Quality Thinking through the Employment of Ergonomics to Improve Service Quality

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Background & Hypothesis:
Good workplace ergonomics profits productivity, efficiency and job satisfaction. Historically, many attempts have been made to improve the working environment. However, the focus has been on the patient; and staff workplaces have benefited little from ergonomic improvements. This project entailed thinking about how service in the x-ray department could be enhanced for both the employee and the patient. Ergonomic strategies that required little or no additional cost were identified and employed to modify the work environment and streamline workflow.

Methods:
The methodology used involved an assessment of the current situation, literature review, the analysis of specific problems through a needs analysis survey, brainstorming, the identification of solutions followed by the implementation of ergonomic changes and postimplementation evaluation. Meaningful and purposeful samples were collated to provide reliable data. Measurement of the effectiveness of the enhancements was performed using a one-time assessment reported in the context of the environment. Patient service time, productivity improvements and manhour cost savings were measured and charted.

Results:
The ergonomic modifications made resulted in a 72% improvement in performance with annual recurrent savings of 2000 manhours and dollar savings of $40,000 from just one clinic. The benefit-to-cost ratio gleaned was a whopping 67:1.

Discussion & Conclusion:
Although small in scale, this ergonomics project reaped unexpectedly disproportionate benefits and gleaned lessons for radiography departments in other clinics and future setups. It profited productivity, efficiency, safety and staff satisfaction whilst reducing fatigue.

AH-77

Development of an Activities of Daily Living Scale for Individuals with Depression in Singapore

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Background & Hypothesis:
Assessing functional performance is crucial in the occupational therapy process. However, existing assessments rarely assess performance based on constructs characteristic of depression. This study aims to develop a content valid and culturally relevant Activities of Daily Living (ADL) Scale for adults in Singapore with depression.

Methods:
An exploratory sequential design was used in this study. Items and constructs were generated with reference to existing Instrumental Activity of Daily Living Skill assessments, the Activity Card Sort-Singapore Version (ACS-SG), the Diagnostic and Statistical Manual of Mental Disorders Version 5 (DSM-5) and several depression scales. Twenty individuals with depression and 25 occupational therapists (experts) were interviewed after completing a questionnaire to rate the relevance of headings, items and constructs to depression. The item pool and constructs were refined based on qualitative feedback from the experts. Computation of Item Content Validity Index (I-CVI) was conducted after another round of feedback from 22 experts.

Results:
The final scale, Singapore ADL assessment for individuals with Depression-Version 2 (SAD-2) consisted of 27 items and 14 constructs. The constructs: Volition, Mood, View of Self and Energy were most relevant to the scale based on their consistently high I-CVI values between 0.68 to 1. Compared to other subheadings that had variable I-CVI values, all constructs per item in the Work and Productive Activities had high I-CVI values.

Discussion & Conclusion:
The scale is culturally relevant and provides some clinical validity in assessing functional performance during depression. Prospective studies involving a pilot test could explore the scale's clinical utility and psychometric properties.

AH-78

Comparing Outcomes and Retention Rates between Mandated and Non-Mandated Clients Seeking Treatment for Alcohol Use at NAMS

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Background & Hypothesis:
As previous studies' results varied with little work done in Singapore on the subject, our study aims to explore the outcomes and retention of treatment mandated versus non-mandated clients.

Methods:
A total of 195 (152 non-mandated, 43 mandated) outpatients (179 males, 16 females) fulfilling DSM-IV criteria for alcohol use disorder seeking treatment at the National Addictions Management Service (NAMS) between April 2013 to March 2016 were included. Variables included demographic, clinical information from medical records, baseline and 3-months data from the Addiction Severity Index-lite (ASI-lite).

Results:
One-way ANOVA and chi-square analysis were used. Non-mandated clients had higher baseline ASI-lite scores (0.54 vs 0.27), higher dropout rates after 3 months (41.4% vs 20.9%) and higher 3 months ASI-lite scores (0.24 vs 0.15), but made more improvements in ASI-lite scores by the third month (0.30 vs 0.12). There was no significant difference between both groups for age of first drink.

Discussion & Conclusion:
In view of no direct consequences for non-attendance, it is encouraging to see a higher retention rate for mandated clients. Higher baseline ASI-lite scores for non-mandated clients could be sample bias. They sought help due to severe impact of alcohol on their lives whilst mandated clients were referred by other organisations as part of a process and their use may not be as severe. Future studies could examine whether motivation plays a role in impacting treatment outcomes between the 2 groups.

AH-79

Implications of an Antibiotic Allergy Label in Patients with Bacteraemia: A Tertiary Hospital-matched Cohort Study

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Background & Hypothesis:
Early effective antibiotics are critical in patient with bacteraemia to reduce morbidity and mortality. Antibiotic allergies complicate empiric antibiotic choices which could result in suboptimal therapy. This study is the first examining the treatment outcomes and quality of antibiotic allergy records in patients with bacteraemia in Singapore.

Methods:
A retrospective 1:2 matched-cohort study involving Tan Tock Seng Hospital patients with bacteraemia in 2014 was conducted. Subjects with an antibiotic allergy recorded prior to the episode of bacteraemia were matched by age, gender and microorganism to those with no record of allergy. Exclusion criteria included polymicrobial bacteraemia or multidrug resistant (MDR) infections. The primary outcome was 180-day readmission rates. Secondary outcomes included 30-day mortality, emergence of resistant infections, adherence to hospital antimicrobial guidelines, and an evaluation of antibiotic allergy documentation.

Results:
A total of 2242 unique episodes of bacteraemia were screened; 1256 were with a non-MDR organism, of which 97 were in subjects with a reported antibiotic allergy; 43 met study inclusion/exclusion criteria and were matched to 86 subjects without antibiotic allergies. Subjects with recorded antibiotic allergies had a significantly increased rate of infection-related readmission (32.6% vs 14.0%, $P = 0.012$) and infection with MDR organisms 180 days (18.5% vs 4.7%, $P = 0.020$ respectively). However, 30-day mortality was not significantly different in subjects with an antibiotic allergy (2.3% vs 4.7%). Fifty percent of antibiotic allergy reports were unconfirmed, and 35.3% had unknown presentations.

Discussion & Conclusion:
Antibiotic allergies are associated with an increased risk of poorer outcomes. More reliable and detailed allergy reports would assist clinicians in choosing appropriate empiric antibiotics.

AH-80

Attitude to Mental Illness and its Components among the General Population in Singapore

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Background & Hypothesis:
Public attitudes are important in the field of mental health as it influences how the public interact with, provide opportunities for, and help persons with mental illness. The current study aims to elucidate the underlying factors of the Attitude to Mental Illness Questionnaire among Singapore's general population and identify their demographic correlates.

Methods:
Data for the current study was extracted from a national mental health literacy survey conducted in Singapore from March 2014 to April 2015. The sample consisted of 3006 Singapore residents (citizens and permanent residents) aged between 18 to 65 years. Public attitudes were measured by the 26-item Attitude to Mental Illness Questionnaire. Exploratory factor analysis (EFA) in Mplus 7.0 with weighted least squares means and variance adjusted estimator. Geomin rotation was used (items inclusion criteria: cutoff = 0.4, no cross-loading; number of factors: eigenvalues >1). Associations were examined using multivariate linear regression.

Results:
EFA revealed a 5-factor structure after excluding 4 items: fear & social distancing (f1), limited role and responsibility (f2), understanding & tolerance (f3), community integration (f4), and prejudice & misconception (f5). Regression suggested older people had more negative attitudes on f1, f2, f4 and f5. Being a housewife/homemaker was associated with lower f1 and f2 scores. Higher monthly income was negatively associated with f1, and Malays had higher f3.

Discussion & Conclusion:
Older age, being a housewife/homemaker, Malay ethnicity and higher monthly income are risk factors for negative attitudes towards people with mental illness. For future attitudes campaigns, policymakers should take these risk factors into consideration.

AH-81

Differential Amino Acid Profiles in Type 2 Diabetes Patients with Peripheral Neuropathy: A Repeated-Measure Study

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Background & Hypothesis:
Diabetic peripheral neuropathy (DPN) is a common microvascular complication. Proposed mechanisms for development of DPN include blood vessel abnormalities, neuronal ischaemia and severe oxidative toxicity. We examined the association of altered circulating amino acid metabolism which is a significant contributor to the development of DPN in a prospective cohort of carefully phenotyped patients with DM.

Methods:
Amino acid profile has been applied to plasma samples from 96 subjects at baseline and 3-years intervals by LC-MS; 48 cases are developed DPN over as much as 3 years of follow-up, compared to 48 controls that did not develop DPN being matched for age (mean 59.67 [8.35] yrs), fasting glucose (mean 7.93 [2.57] mmol/l), duration of diabetes (mean [1SD] of 15.6 [9.0] yrs), and renal function (mean eGFR 78.2 [32.4] ml/min/1.73m^2).

Results:
A two-way ANOVA was conducted that examined the effect of time points and amino acid profile on interest in incident DPN. There was no statistically significant interaction between the amino acid profile and a 3-years' interval on DPN. Incident DPN had significant lower tryptophan (42.0 vs 48.8 uM; $P = 0.007$) at baseline. Glutamate and aspartate were dramatically decreased in both cases and controls ($P = 7.2$, E-36, $P = 6.3$, E-9 respectively) after 3 years' interval.

Discussion & Conclusion:
Apart from higher blood glucose levels, significant lower level of tryptophan at baseline, and dramatically decreased concentration of glutamate and aspartate, was observed in incident DPN after 3 years' interval. Tryptophan-kynurenine pathway might be associated with diabetic microvascular complications pathogenesis by mechanism of oxidative stress.

BSTR-01

Cytokine Profiling in Patients with Age-related Macular Degeneration and Polypoidal Choroidal Vasculopathy

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Background & Hypothesis:
We aimed to investigate the distintive cytokine profiles in plasma and aqueous humor of patients with age-related macular degeneration (AMD) and polypoidal choroidal vasculopathy (PCV), and its comparison with age and gender-matched controls.

Methods:
In this prospective case-control study, undiluted aqueous humor (up to 200 μl) and blood samples were collected from 24 AMD/PCV patients and 39 controls, and only blood samples were collected from 9 controls. Forty-one cytokine levels were measured in the clinical samples using Luminex bead-based multiplex assay and the differences in the cytokines levels in plasma and aqueous humor in each group were analysed.

Results:
The mean age of the patients with AMD/PCV was 72.5 ± 10.5 (mean $\pm$ SD) years and the control group was 62.8 ± 10.7 (mean $\pm$ SD) years. Male and female ratio was 15:9 and 29:19 in AMD/PCV group and control group respectively. Plasma levels of GRO, PDGF-AA, Fractaline and IL-9 and aqueous humor levels of GRO, MDC, MIP-1a, MCP-1, IP-10, IL-6, IL-8, IL-15, and IFNα2 significantly differed (P <0.05) between the control and AMD/PCV patients. When compared between AMD and PCV patients, plasma levels of PDGF-AA, IL-1RA, MCP-3, sCD40L, IL-8, MIP-1β and aqueous humor levels of IL-12p70 significantly differed (P <0.05) between the 2 groups.

Discussion & Conclusion:
In AMD/PCV patients, the pathological changes in the eye were mainly due to deregulation of local immune factors and the aqueous humor cytokine levels (except GRO) cannot be correlated with their counterparts in the plasma. Aqueous humor IL-12p70 can serve as an ideal diagnostic biomarker for differentiation between AMD and PCV.

BSTR-02

Assessment of High-Sensitive C-Reactive Protein (hs-CRP) as a Clinical Biomarker for HNF1A-MODY in Multiethnic Singaporean Asian Cohort

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Background & Hypothesis:
Maturity-onset of the young (MODY) is a form of monogenic disease that accounts for ~5% of young-onset diabetes. Studies (mostly in Caucasian populations) suggest that patients with HNF1A-MODY (MODY3) (treatable with oral sulphonylureas) have lower hs-CRP levels than those with other forms of diabetes and MODY subtypes. We hypothesise that our Asian HNF1A-MODY patients similarly possess lower hs-CRP levels which can be used as a clinical biomarker to shortlist patients for MODY3 genetic testing.

Methods:
Patients were recruited based on their strong MODY-like clinical phenotypes for targeted re-sequencing/genotyping of 17 candidate genes using the Ion Torrent PGM/Taqman genotyping assay. Serum hs-CRP levels were measured using CRPHS ELISA on COBAS analyser. Mann-Whitney test was performed to compare the hs-CRP levels (patients with ≥ 10 mg/L readings excluded) between HNF1A (HNF1A+) and non-HNF1A (HNF1A-) variant carriers. Performance of hs-CRP as a biomarker was assessed using ROC analysis.

Results:
A total of 54 patients were found to possess genetic variants of significance, of which 7 (13%) are HNF1A+. hs-CRP levels in HNF1A+ (mean hs-CRP $\pm$ SD 0.93 ± 0.75 mg/L) were found to be significantly lower than in HNF1A- patients (2.25 ± 1.96 mg/L, $P = 0.03$). ROC analysis determined AUC to be 0.754 (CI, 0.57-0.94, $P = 0.032$); 71% sensitivity and 62% specificity were achieved with a cutoff at 1.15 mg/L.

Discussion & Conclusion:
hs-CRP level can be used as a biomarker to differentiate HNF1A+ from HNF1A- MODY-like patients for our multiethnic Asian cohort. A larger study sample size can help determine a cutoff with improved sensitivity and specificity.

BSTR-03

Novel Chemotherapeutic Agents for Potential Application in Photodynamic Therapy of Cancer

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Background & Hypothesis:
Cancer is the leading cause of death in Singapore. Chemotherapy which is the primary form of cancer treatment can cause many side effects including anaemia, nausea and fertility changes. In recent years photodynamic therapy (PDT) has risen in popularity over traditional chemotherapy. PDT is more targeted cancer therapy with reduced side effects that uses light energy to activate PDT drugs and generates reactive oxygen species to kill cancer cells. With the aim of discovering novel drug candidates for application in PDT, the present study reports the successful design and synthesis of a new class of chemical compounds with photo-nuclease activity.

Methods:
The project involves chemical synthesis, analytical and spectral characterisation, X-ray crystallography, absorption titration, gel electrophoresis and cell line studies.

Results:
The compounds were obtained in a 2-step synthesis process with high yield. The compounds show good DNA binding and cleavage activity on light activation. The compounds are found to be highly effective against skin melanoma cell lines and less toxic to normal skin cells. The preclinical animal studies on the compounds are in progress.

Discussion & Conclusion:
This novel class of chemical compounds has received patent status in Singapore and Australia. The fast, simple and efficient synthesis process of making the compounds may significantly reduce the cost of ingredients and manpower of the overall manufacturing process. Thus, if the trials are successfully conducted, these compounds would create a new class of PDT drugs that make cancer treatment cheaper, but just as effective with reduced side effects.

BSTR-04

Distribution and Chondroprotective Role of Pericellular Matrix Molecules in Temporomandibular Joint

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Background & Hypothesis:
Temporomandibular joint osteoarthritis (TMJ-OA) is an important subtype of temporomandibular disorders and is characterised by progressive cartilage degradation, synovitis and chronic pain. The pericellular matrix (PCM) is a specialised layer of extracellular matrix that surrounds the chondrocytes and has been postulated to have important functions. This study aimed to: 1) determine the distribution of PCM molecules—collagen VI, collagen IV and laminin in rat TMJs; and 2) investigate the protective effects of PCM molecules against inflammation present in OA.

Methods:
TMJs from 12 adult female rats were used. Immunohistochemistry of PCM molecules was performed. Isolated chondrocytes were pretreated with PCM molecules before treatment with interleukin (IL)-1β to induce inflammation. Chondrocyte responses were measured by real-time RT-PCR and nitric oxide (NO) production.

Results:
Collagen VI, collagen IV and laminin were detected within the PCM surrounding individual chondrocytes with the highest abundance in the proliferating zone of condylar cartilage. Among the PCM molecules, pretreatment of collagen VI attenuated IL-1β-induced expression of MMP-3, MMP-9, MMP-13 and iNOS, while reducing the downregulation of COMP, COL-1 and ACAN. Concurrently, NO production was reduced with collagen VI treatment.

Discussion & Conclusion:
PCM molecules – collagen VI, collagen IV and laminin are present in TMJ, and are synthesised by TMJ condylar and disc chondrocytes. Among these PCM molecules, collagen VI exerts protective effects on TMJ chondrocytes against inflammation. Our findings may help in the elucidation of new treatment strategies focusing on PCM for effective prevention and/or treatment of TMJ-OA.

BSTR-05

Identification of Novel Rheumatoid Arthritis Variants by Targeted Sequencing

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Background & Hypothesis:
Mounting evidence supported the existence of a genetic component in the aetiology of rheumatoid arthritis (RA). This study aimed to search for novel risk alleles in Singapore Chinese RA patients with anticitrullinated peptide antibodies (ACCP) using next generation sequencing.

Methods:
Targeted sequencing of 128 genes was performed in 48 RA cases and 45 healthy controls. These genes were selected based on RAvariome database and review of published literatures. The target exons and 5' non-coding regulatory regions were enriched using the Nimblegen SeqCap EZ kit (Roche) followed by parallel sequencing using Miseq (illumina). Variant detection and annotation were accomplished using the Genome Analysis Toolkit (GATK) pipeline and ANNOVA. Association analysis for population stratification between RAI cases and controls was determined by using PLINK.

Results:
A dataset of 696 high quality variants consisting of 14.2% non-synonymous, 68.5% coding synonymous/UTRs and 16.6% up/down stream of gene was obtained. We focused our analysis on rare/low frequency variants (MAF <5%) that are not reported in previous GWAS studies. Risk association analysis identified 13 de novel non-synonymous variants. Among these, in the exons of AHNAK2 (rs77454674, rs201071549, rs144426530, rs144488514), AFF3 (rs117712488), PTPRC (rs148561683), FCRL3 (rs79895668) and ARAP1 (rs2291288) are variants predicted to be damaging. In our non-exonic analysis, we found 7 risk-associated low frequency variants (P <0.05). Intriguingly, 2 variants upstream of RUNX1 (rs56151547) and CCR6 (rs6931699) are found within the chromatin activation H3K4me3 mark and may be associated with epigenetic regulation.

Discussion & Conclusion:
Preliminary data identified novel rare variants in RA that will be validated in a larger cohort.

BSTR-06

Pilot Study to Evaluate WoundAide (an iPAD App) in Measuring Wound Dimension

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Background & Hypothesis:
Nurses find accurate wound measurements challenging even in current times. The cheapest tool using the ruler tends to overestimate the wound. Other methods such as photography, planimetry or laser beam have limitations such as high cost, high maintenance or poor usability. The objective of this study was to pilot test a cheap, innovative prototype iPad app (WoundAide) to accurately measure wound dimension using image analysis.

Methods:
A prospective evaluation was conducted comparing WoundAide with 2 gold standard instruments, Wound Zoom and Visitrak[TM]. This pilot study was conducted in a tertiary hospital in Singapore. Six patients were recruited after obtaining local ethics approval. Ten venous wound images were captured by 2 researchers independently.

Results:
The intraclass correlation coefficient was greater than 0.95 for length, width and surface area of all measuring devices. The mean differences for length, width and surface area were not statistically significant. The coefficient of variation for WoundAide ranged from 2.95% to 33.27%, Wound Zoom 1.29% to 19.28%, and Visitrak[TM] 2.06% to 43.41% for length, width and surface area measurements. The capturing sensitivity was 75% for WoundAide, 99.4% for Visitrak[TM], and 100% for Wound Zoom.

Discussion & Conclusion:
WoundAide has similar reliability and validity as Wound Zoom and Visitrak[TM] which are known to be gold standard wound measurement devices. However, WoundAide has the least sensitivity in image captures. Nonetheless, with enhancements made to its user-interface and system algorithm, this limitation can be addressed. WoundAide can be used for wound measurement with high propensity for widespread use at a relatively low cost.

BSTR-07

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

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Background & Hypothesis:
The retinal and choroid are important structures for light perception and are commonly the sites for ocular diseases. Retinal thickness (RT) and choroidal thickness (CT) are therefore important parameters used in the diagnosis and management of these diseases. Swept-source optical coherence tomography (SS-OCT) and spectral-domain OCT (SD-OCT) are the current gold-standard devices used in these measurements. It has been suggested that quantitative measurements using these devices are incomparable, and may influence the interpretation of clinical outcomes. We aim to evaluate the topographic patterns and compare RT and CT measurements obtained from SS-OCT and SD-OCT.

Methods:
In a prospective cohort study of 125 participants, OCT scans were performed sequentially with Topcon DRI OCT-1 and Spectralis OCT using standardised imaging protocols. RT and CT were independently measured by masked reading centre-certified graders respectively. Paired t-tests and intraclass correlation coefficients (ICCs) were performed.

Results:
The mean central RT differed significantly between Topcon and Spectralis (240.0 µm vs 273.1 µm; *P* <0.001), with a mean difference of 33.1 µm. The interdevice ICC for RT was 0.957. The mean central CT also differed significantly between Topcon and Spectralis (265.6 µm vs 313.7 µm; *P* <0.001), with a mean difference of 48.1 µm, and interdevice ICC of 0.757. Following manual adjustment of segmentation boundaries of the central subfield, the difference between Topcon and Spectralis was reduced from 48.1 µm to 18.3 µm (62.0% reduction; *P* <0.001).

Discussion & Conclusion:
RT and CT obtained from SS- and SD-OCT differ significantly, and should be accounted for when comparing measurements. The difference between CT measurements can be reduced by manual adjustment of segmentation boundaries.

BSTR-08

Encapsulation of Endothelial Cells within Gelma Fibers Using Bessel Beams for Vascularisation Applications

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Background & Hypothesis:
In order to engineer large 3D tissue, vascular networks need to be incorporated into the tissue to prevent cell necrosis cause by insufficient access to nutrients. In this project, we propose a new method to produce viable vascular endothelial tubes in vitro. We hypothesised that using our technique would allow us to fabricate self-assembled, lumenised, free-standing tubes.

Methods:
Human umbilical vein endothelial cells (HUVECs) were encapsulated within gelatin methacrylated (Gelma) hydrogel fibres by exposing a prepolymer cell-loaded solution to a UV laser Bessel Beam which produced free-standing cell-laden gelma fibers upon polymerisation from a single exposure. Acellular gelma fibers were also fabricated and observed under brightfield microscopy to determine their diameters. Live/dead assay was performed on cell-laden fibres after 3 days in vitro to determine cell viability while Dapi and Rhodamine-Phalloidin staining was performed at day 1, 3, and 5 in vitro to observe proliferation and vasculogenesis of the cells.

Results:
By manipulating the optical setup and laser power, gelma fibre diameters could be accurately controlled experimentally and predicted based on mathematical models. Cell viability at day 3 was high (>95%) and cells proliferated with time. Under confocal microscopy, encapsulated HUVECs were observed to self-assemble into lumenised endothelial tubes with clear lumen after 5 days in supplemented medium.

Discussion & Conclusion:
We managed to develop a high throughput method of cell encapsulation within hydrogel fibres with controlled diameters. Based on our results, cells remained viable and maintained normal phenotype after the fabrication process while managing to self-assemble into lumenised endothelial tubes in vitro.

BSTR-09

Retrospective Audit of Inpatient Hypoglycaemia

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Background & Hypothesis:
A significant proportion of diabetic inpatients experience hypoglycaemia. The aim of this retrospective audit is to identify predictors of inpatient hypoglycaemia and its association with mortality and length of stay (LOS).

Methods:
Capillary blood glucose (CBG) readings were obtained using point-of-care data system from 1 March 2016 to 31 March 2016. Hypoglycaemia is defined as CBG ≤3.9 mmol/l and severe hypoglycaemia (SH) as CBG ≤2.9 mmol/l. HbA1c, creatinine, LOS, medications and discharge outcome were determined for each individual.

Results:
A total of 144 patients (47% males) experienced hypoglycaemia with a total of 303 hypoglycaemic episodes. Mean ± SD age was 67.6 ± 12.6 years, HbA1c 7.8 ± 2%, creatinine 214 ± 213 umol/l, and LOS 12.9 ± 12.4 days. Mortality was 9%. A significant proportion (26.4%) of patients had SH and 2.8% had CBG ≤2.2 mmol/l. Majority (55.6%) had recurrent hypoglycaemia >1 episode and 51.4% had ≥2 days of hypoglycaemia. Prior insulin use was present in 48.6%, 53.5% on sulphonylurea and 11.1% on both insulin and sulphonylurea. Amongst those who survived, there was no difference in age, HbA1c, renal impairment, weight, admission discipline and use of oral hypoglycaemic agents in predicting severity of hypoglycaemia. Use of premix insulins was associated with increased frequency of hypoglycaemia, $P = 0.036$. After adjusting for age, race, gender, creatinine and BMI, recurrent hypoglycaemia (≥2 episodes) was associated with longer LOS, 9.8 ± 6.6 days for 1 episode vs 14.2 ± 14.7 days for ≥2 episodes, $P = 0.045$ but not mortality (HR 2.779 [95% CI 0.546-13.05], $P = 0.225$). Severity of hypoglycaemia did not predict mortality, $P = 0.090$.

Discussion & Conclusion:
Inpatient hypoglycaemia is significant amongst hospitalised diabetic patients, leading to increased length of stay.

BSTR-10

Association of Betatrophin with Type 2 diabetes

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Background & Hypothesis:
The prevalence of type 2 diabetes (T2D) is increasing worldwide. As β-cell function is key in diabetes management, identifying biomarkers predicting their function will have important therapeutic implications. Betatrophin is potentially associated with β-cell regeneration. We aim to assess levels of betatrophin with the hypothesis that it will be differentially expressed in non-diabetes versus T2D obese individuals

Methods:
Morbidly obese participants (n = 231) with BMI ≥28 kg/m^2 who underwent bariatric surgery at KTPH were recruited. Obese-diabetic cohort (n = 49) was selected based on fasting plasma glucose (FPG) ≥7mmol/L while obese non-diabetic cohort (n = 66) based on FPG ≤5mmol/L. Plasma betatrophin levels were measured using enzyme-linked immunosorbent assay and data analysis was performed using SPSS version 22.

Results:
Plasma betatrophin were significantly higher in obese diabetic than obese non-diabetic (3519.76 [2882.59-4156.92] vs 1871.02 [1693.18-2048.86] pg/mL, P <0.001). Spearman correlation showed that log-transformed betatrophin was positively associated with age (rho = 0.479; P <0.001), gender (rho = 0.209; P = 0.024), ethnicity (Chinese vs Malays vs Indians) (rho = 0.373; P <0.001), FPG (rho = 0.355; P <0.001), glycated haemoglobin (HbA1c) (rho = 0.471; P <0.001), albumin to creatinine ratio (ACR) (rho = 0.392; P <0.001), but negatively correlated with homeostasis model assessment beta cell function (HOMA2β) (rho = -0.345; P <0.001) and eGFR(rho = -0.441; P <0.001). After adjusting for age, gender, ethnicity and HOMA2β, log-transformed betatrophin (B = 6.77, P <0.001) and log-transformed HOMA2β (B = -3.56, P = 0.002) remained significant predictors of diabetes.

Discussion & Conclusion:
Higher circulating betatrophin in morbidly obese diabetes cohort suggest that betatrophin may play a role in the pathogenesis of diabetes. Further in vitro work is planned to understand the significance these raised levels.

BSTR-11

Common Food Antimicrobials: Effects on Cellular Inflammation and Oxidative Damage and Their Estimated Occurrence in Singapore

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Background & Hypothesis:
The prevalence and potential health effects of common food antimicrobials in processed foods and beverages are relatively unknown in Singapore. The occurrence of chemical antimicrobials in processed foods and beverages and their effects on inflammation and oxidative stress in vitro were examined.

Methods:
The occurrence of antimicrobials in 1605 processed food and 359 beverage items were examined by surveying the ingredients on the product labels. Human neutrophils were exposed to physiological relevant concentrations of common antimicrobials. Established markers of inflammation, leukotriene B4 and oxidative stress, F2-isoprostanes were measured using stable-isotope dilution gas chromatography mass spectrometry.

Results:
Antimicrobials were added to 23.2% of the processed foods and beverages. Sorbic, benzoic, lactic, propionic and acetic acids accounted for 84.8% of the added antimicrobials in the processed foods and beverages; 92.5% of the breads contained propionic acid. Lactic acid was the most common antimicrobial (44.4%) in cheeses. Sorbic acid was added to 63.2% of the margarine. Sauces (31.5%), energy drinks (50.0%), soft drinks (70.7%) and fruit cordials (66.6%) contained added benzoic acid. Benzoic and propionic acids at physiologically relevant concentrations augmented leukotriene B4 formation (benzoic acid, EC50 = ~100 ppb and propionic acid, >200 ppb). Lactic and sorbic acids inhibited dose dependently the F2-isoprostanes production (IC50 values ~100 ppb) and myeloperoxidase activity (IC50 values ~100 ppb).

Discussion & Conclusion:
Our results demonstrate that Singapore consumers are significantly exposed to food antimicrobials, and these molecules, in physiologically relevant concentrations, exert significant and differential biological effects in vitro.

BSTR-12

Prospective Metabolomics Analysis Reveals Preferential Lowering of Branched-Chain Amino Acid-derived Acylcarnitines in Individuals with Improved Type 2 Diabetes at Early Stages after Bariatric/Metabolic Surgery

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Background & Hypothesis:
Bariatric/metabolic surgery is the most potent treatment for type 2 diabetes (T2DM). However, some patients do not exhibit complete diabetes remission after surgery. Dysregulated amino acid and fatty acid metabolism plays a pivotal role in the development of T2DM. Acylcarnitines are byproducts of branched-chain amino acid (BCAA) and fatty acid oxidation. We hypothesise that a differential acylcarnitine profile exists between T2DM individuals who responded favourably and poorly to surgery.

Methods:
Targeted acylcarnitine analysis was performed on 2-hour postglucose challenge plasma samples obtained before and after surgery by liquid chromatography-mass spectrometry. Fold change (postop divided by preop) in acylcarnitine levels was calculated. Subjects (n = 31) were categorised by tertiles of postoperative follow-up time. Tertile 1 (n = 10, ranging from 6-30 days postop visit) and tertile 3 (n = 10, ranging from 52-148 days postop visit) were subjected to statistical comparison. Responders were defined as having improved T2DM status (e.g. from T2DM to IGT/normal) at postsurgery follow-up.

Results:
Responders comprised 70% and 50% of subjects in tertiles 1 (restricted diet) and 3 (normal diet), respectively. In non-responders who resumed normal diet, unsaturated long-chain acylcarnitines C20:1 and C20:2 were significantly altered compared with non-responders on restricted diet (all P <0.05). Conversely, responders who progressed to normal diet displayed lower levels of BCAA-derived short-chain acylcarnitines C3, C5 and C5:1 and higher levels of medium-chain C7-DC and long-chain C18 acylcarnitines (all P <0.05) than responders in tertile 1.

Discussion & Conclusion:
Pronounced decline in postprandial plasma BCAA-derived acylcarnitines seems to be associated with T2DM improvement during the early periods after bariatric/metabolic surgery.

BSTR-13

A Study of the Antimicrobial Effects of *Lucilia* Sericata Larvae

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Background & Hypothesis:
With the rapid emergence of multiple-drug resistant bacterial strains, there is a pressing need to research new and more effective therapeutics. This project aimed to investigate the antimicrobial effects of excretions/secretions and gas flatulence produced by *Lucilia* sericata larvae, which are often used in maggot debridement therapy, on *Escherichia* coli, *Staphylococcus* epidermidis and *Micrococcus* luteus.

Methods:
Lucilia sericata larvae were reared on a diet of ad libitum pig's liver; third-instar larvae (3-day-old) were used for all experiments. Briefly, overnight excretions/secretions were collected from third-instar larvae and filter-sterilised before use. One thousand µl of 103 colony forming units (cfu)/mL bacterial broth culture was combined with 100 µl of sterile excretions/secretions extract, antibiotic ampicillin or sterile water (control), and antimicrobial effect was quantified using colony count. Separately, using an air-tight setup, gas flatulence produced by 500 third-instar larvae was applied to bacterial culture plates and an accompanying control plate (with no bacteria plated) for an hour, before overnight incubation and colony count.

Results:
The excretions/secretions and gas flatulence produced by *L.* sericata larvae showed significant inhibitory actions against both Gram-positive and Gram-negative bacteria tested in this experiment (P <0.05). Furthermore, the antimicrobial effects of the excretions/secretions were comparable to that of ampicillin; in fact, it exhibited a more pronounced antimicrobial effect against *S.* epidermidis than ampicillin. The gas flatulence also caused a significant reduction in the size and number of bacterial colonies (P <0.05).

Discussion & Conclusion:
The results showed that natural products from *L.* sericata larvae have potent antimicrobial activity. Future work entails further bioassays and detailed chemical analyses.

BSTR-14

The Emotional Ups and Downs of Buying Sex: A Qualitative Study among Singaporean Adolescents

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Background & Hypothesis:
Most studies focus on the motivations and perceptions of adults buying sex and rarely include adolescent participants. The objective of this study is to explore the antecedents and the experiences of buying sex, and the motivations to buy sex again among Singaporean adolescents.

Methods:
We conducted semi-structured in-depth interviews with 20 heterosexual male adolescents aged 17 to 20 at the only public STI clinic in Singapore between September 2014 and March 2015. Interviews were transcribed and coded thematically.

Results:
Of the 20 participants, 18 bought sex more than once and 4 had ever bought sex overseas. The median (range) number of commercial partners was 3 (1 to >20). Most participants bought sex because it was difficult for them to find casual partners or girlfriends, out of curiosity or under the influence of their peers or alcohol. They would self-justify to reduce their moral dilemma. Positive emotions were experienced when "shopping" for sex workers up till the encounter with sex workers. After the encounter, they have high perceived vulnerability to HIV despite (almost) consistent condom use. When they experienced a period of no symptoms, the perceived vulnerability decreased, and the cycle of desiring to buy sex began again. With each experience of buying sex, the perceived vulnerability decreased.

Discussion & Conclusion:
Adolescents have to be educated about the possibility of asymptomatic STIs and the risks involved in buying sex. Adolescents should also be included in interventions targeting adult males buying sex and be encouraged to go for regular STIs/HIV screenings.

BSTR-15

Black Tea as a Potential Inhibitor of Mutagenesis in Bacteria

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Background & Hypothesis:
A variety of drugs, such as fluoroquinolones, nitrofurans and platinum compounds, have a mutagenic effect on bacteria. This effect occurs through the activation of repair systems, in particular, SOS-repair, which eventually leads to antibiotic resistance. The paper by Cirz and colleagues shows the necessity of researching on the synthetic inhibitors of the SOS response to discover their therapeutic uses with DNA damaging agents. We hypothesise there may be promising ones among natural substances.

Methods:
We used the *E. coli* MG1655 pRecA-lux strain, which expresses bioluminescence while activating SOS repair genes. Tea extract was prepared at 100°C in a concentration of 0.1 g/mL and the liquid phase was collected. We investigated the concentration of 0.01, 0.001, 0.00001 and 0.0001 g/mL.

Results:
Our study demonstrates the effect of suppressing the SOS-induction in *E. coli* under the action of 0.2 µg/mL ciprofloxacin through extracting Lapsany black Ceylon leaf tea. It was found that the extract, at a concentration of 0.01 g/mL, decreased the mutagenic effect of ciprofloxacin at $90 \pm 2.3\%$ (0.6 times).

Discussion & Conclusion:
It can be assumed that components of tea extract not only protect human DNA from oxidative damage, but also inhibit the work of SOS-repair system in the bacteria of human microbiome, reducing the likelihood of the development of antibiotic resistance by the action of fluoroquinolones. This study was supported by the Ministry of Education and Science of the Russian Federation (project No. 6.1202.2014/K).

BSTR-16

Distribution of Drug Resistance Associated with AY-Lactamase Genes in *K. pneumoniae* Isolated from Outpatients

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Background & Hypothesis:
Extended-spectrum β-lactamases (ESBL) are enzymes produced by various bacterial species as a defence against β-lactam drugs, with the genes encoding those enzymes being mainly located on mobile genetic elements. The ESBL-producing *K. pneumoniae* is an important human pathogen that causes nosocomial infections. The aim of this study was to detect genes—markers of resistance to β-lactams drugs—*TEM* and *CTX-M* in *K. pneumoniae* isolated from outpatients.

Methods:
Thirty-six isolates of *K. pneumonia* used in this study were isolated from outpatients and tested for sensitivity to penicillin and cephalosporin using the disc diffusion method. We used isolates which were resistant to 1 or more antibiotics. PCR was used to detect β-lactamase genes *bla (TEM)* and *bla (CTX-M)*.

Results:
The highest resistance of isolates of *K. pneumoniae* was to ampicillin (100%), and 58% were resistant to cefazolin and cefotaxime. These isolates harboured different β-lactamase genes. Among them, 28% were positive for *TEM* and 33% positive for *CTX-M*. Nineteen percent of isolates included *bla (TEM)* and *bla (CTX-M)* both.

Discussion & Conclusion:
Our data has revealed that multidrug resistance of the isolates *K. pneumoniae* is associated with β-lactamase genes and the presence of these genes in isolates from outpatients favour the spread of antimicrobial resistance in patients, the healthy population and environment. The study was supported by the Ministry of Education and Science of the Russian Federation, basic task number 1878 "Development of the fundamental aspects of molecular diagnosis of mitochondrial and pharmacology".

BSTR-17

DNA Protective Properties of Oligopeptides Depend on the Presence of Lysine in the Molecule

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Background & Hypothesis:
It is known that oligopeptides carry out a number of regulatory functions in a cell, including those related to the antioxidant defense and DNA protection. Oligopeptides extracted from animal tissues and their synthetic analogues were shown to have anti-ageing effects and ability to stimulate the adaptive capacity.

Methods:
In this study, the activity of the 4 synthetic oligopeptides with adaptogenic properties was studied. For the DNA damaging agent, we used dioxidine and 311 nm UV (12.2 - 10^{-7} J/m^2 per second). The following peptides were used: Pankragen Lys-Glu-Asp-Trp, Pinealon Glu-Asp-Arg, Vezugen Lys-Glu-Asp, Izovilon Lys-Glu. DNA protective effect was examined in *E. coli MG1655 RecA-lux*. This genetically engineered strain responds to DNA damage with bioluminescence.

Results:
Protective activity against DNA damage caused by UV increased in a line: pinealon (0%) → pankragen (6.1%) → vezugen (8.1%) → izovilon (31.7%). The direct correlation with the content of lysine is obvious: pinealon (0%) <pankragen (25%) <vezugen (33.3%) <izovilon (50%). Degree of protection against dioxidine demonstrated the same trend. The most effective protectors were vezugen (62.74%) and izovilon (72.93%).

Discussion & Conclusion:
One can conclude that the presence of a lysine residue in the molecule plays an important role. It has been shown in the works of Kornienko et al and Chistyakov et al that lysine can be an effective interceptor of superoxide anion-radical. Thus, oligopeptides containing lysine may have a DNA protective effect by intercepting ROS. This work was supported by the Ministry of Education and Science of the Russian Federation (project No. 6.1202.2014/K).

BSTR-18

Single-Walled Carbon Nanotubes' Effect on the Survival of Eukaryotic and Prokaryotic Cells

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Background & Hypothesis:
Carbon nanotubes are increasingly used in the industrial and medical fields. In this regard, their effect on biological objects is of interest. We examined the effects of nanomolar concentrations of carbon nanotubes in prokaryotic and eukaryotic cells under optimal conditions and under stress.

Methods:
In this study, the following microbial strains were used: haploid yeast strain *Saccharomyces cerevisiae W303*, *Escherichia coli MG 1655* and *Bacillus amyloliquefaciens B-1895*. Dioxidine (an antimicrobial DNA-damaging agent) was used as a stress-inducing factor. For yeast treating, the concentration of 5000 µg/mL was used; for bacteria the concentration was 50 µg/mL. The Tuball carbon nanotubes (Plazmohimicheskie tehnologii Ltd., Russia) were used in the concentration of 100 µg/mL.

Results:
Carbon nanotubes in the concentration of 100 µg/mL had no significant effect on survival of the bacteria and yeast cells in optimal conditions. Dioxidine reduced viability of *S. cerevisiae W303* cells by 55.5% (P <0.05), of *E. coli MG 1655* by 83.1% (P <0.05), of *B. amyloliquefaciens B-1895* by 57.3% (P <0.05). In the presence of nanotubes, toxic effects of dioxidine was decreased: cell viability in *S. cerevisiae W303* was only reduced by 39.5% (P <0.05), in *E. coli MG 1655* by 34.3% (P <0.05) and by 13.4% (P <0.05) in *B. amyloliquefaciens B-1895*.

Discussion & Conclusion:
Thus, it can be concluded that the single-walled carbon nanotubes may have protective effect in stress conditions; in concentrations, they have no effect on the cells under optimal conditions. This work was supported by the Ministry of Education and Science of the Russian Federation (project No. 6.1202.2014/K).

BSTR-19

The Distribution of Alleles and Genotypes for Genes Involved in the Regulation of Glutathione Metabolism among Russians from the Central Russia

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Background & Hypothesis:
Genetically determined deficiency of glutathione (GSH) may contribute to oxidative stress, which plays a key role in the pathogenesis of many diseases. The present study was designed to explore the allele and genotype frequencies in common single nucleotide polymorphisms (SNP) of genes involved in the regulation of GSH metabolism in a population sample of Russian individuals living in central Russia.

Methods:
A total of 780 unrelated Russian individuals were recruited for the study. Genomic DNA was subjected for genotyping 4 SNPs such as *rs2551715* (GSR, glutathione reductase), *rs1801310* (GSS, glutathione synthetase), *rs4820599* (GGT1, gamma-glutamyltransferase 1), *rs7674870* (SLC7A11, solute carrier family 7 member 11) using TaqMan-based assays.

Results:
Genotype frequencies of all studied SNPs were in agreement with Hardy-Weinberg equilibrium (*P* >0.05). Allele and genotype frequencies for SNP *rs2551715* were 39% (T), 22.7% (TT), 31.9% (TC) and 45.3% (CC); for SNP *rs1801310* were 41% (A), 17.4% (GG), 46.6% (AG) and 36.0% (AA); for SNP *rs4820599* were 30% (G), 51.8% (AA), 36.1% (AG) and 12.1% (GG); for SNP *rs7674870* were 46% (G), 30.1% (AA), 47.7% (AG) and 22.2% (GG).

Discussion & Conclusion:
Allele and genotype frequencies of the studied SNPs in the Russian population are comparable with those reported in European populations. The data can be used as reference values for further genetic association studies on genes involved into the GSH metabolism in various multifactorial diseases such as hypertension, stroke, CAD, bronchial asthma and other disorders. The study was supported by the Russian Science Foundation (№15–15–10010).

BSTR-20

Glutathione S-Transferases *M1* and *T1* Gene Polymorphisms and the Risk of Colorectal Cancer in Russians

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Background & Hypothesis:
Colorectal cancer (CRC) is a leading cancer worldwide. Different xenobiotics play a key role in CRC development. Glutathione-S transferases (GSTs) are phase II biotransformation enzymes involved in the detoxification of xenobiotics, thereby protecting cells against potential carcinogenic compounds. Deletion variants of the *GSTT1* and *GSTM1* genes don't express corresponding proteins. A number of studies have found inconsistent associations of *GSTM1* and *GSTT1* polymorphisms with CRC risk. We aimed to investigate whether *GSTM1* and *GSTT1* deletion genotypes are associated with the risk of CRC in Russians.

Methods:
A total of 316 unrelated Russian subjects including 181 CRC patients and 135 sex- and age-matched controls were recruited for this study. Genomic was extracted using phenol/chloroform procedure. *GSTM1* and *GSTT1* genotyping for gene deletions was carried out by the multiplex polymerase chain reaction. The association between the polymorphism and CRC risk was estimated by odds ratio (OR) with 95% confidence interval (CI). The statistical significance was established at $P \leq 0.05$. Statistical calculations were performed with Statistica for Windows 8.0.

Results:
The frequency of *GSTM1* null genotype was 47.0% in patients and 49.6% in healthy controls ($P >0.05$). *GSTT1* gene was associated with CRC risk in borderline significance: the frequency of *GSTT1* null genotype was 19.3% in patients and 11.9% in healthy individuals (OR: 1.78; 95% Cl, 0.94-3.38; $P = 0.07$).

Discussion & Conclusion:
Our results suggested that *GSTT1* null polymorphism could increase the risk of CRC in Russians. Further studies with higher sample size and gene-environmental interactions are required to substantiate a possible association.

BSTR-21

A Validation Study of the Polymorphism of *GSTP1* Gene *(Ile105Val)* as a Susceptibility Gene for Gastric Cancer in Russians from the Central Chernozem Region of Russia

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Background & Hypothesis:
Gastric cancer (GC) is cancer developed from the lining of the stomach. Each year approximately 990,000 people are diagnosed with GC worldwide, making GC the fourth most common incident cancer. A number of studies indicate the significant relationship between GC risk and polymorphic genes for xenobiotic metabolising enzymes. The purpose of our study was to investigate whether polymorphism of *GSTP1* gene *(Ile105Val)* is associated with GC risk in Russians population from the central Chernozem region of Russia.

Methods:
A total of 159 unrelated Russian subjects including 65 gastric cancer patients and 94 age- and sex-matched controls were recruited for this study. Genotyping of the polymorphism (*rs1695*) was done by a TaqMan-based assay. The association between the polymorphism and GC risk was estimated by odds ratio with 95% confidence interval.

Results:
The *GSTP1* genotype frequencies were in agreement with Hardy-Weinberg equilibrium in both GC and control groups ($P > 0.05$). The frequency of homozygous genotype *105II* was 44.6% in GC patients and 45.7% in healthy controls. The frequency of heterozygous genotype *105IV* was 52.3% and 42.6% in GC patients and controls, respectively. Homozygous variant genotype *105VV* was found in 3.1% of GC patients and in 11.7% of healthy controls.

Discussion & Conclusion:
Although a number of studies observed an association between the polymorphism of *GSTP1 gene (Ile105Val)* and GC risk, our results did not confirm that this polymorphism is an important susceptibility locus for gastric cancer in Russians from the central Chernozem region of Russia.

BSTR-22

Genetic Variation of Cytochrome *P450* Genes Involved in the Biosynthesis of Epoxyeicosatrienoic Acids and Hypertension Susceptibility: A Preliminary Study in the Russian Population

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Background & Hypothesis:
Epoxyeicosatrienoic acids (EETs), or oxidised polyunsaturated fatty acids, are involved in the regulation of intercellular signaling pathways, anti-inflammatory processes, regulation of sodium and water reabsorption in the kidneys, vasodilation, and other biological functions playing a role in blood pressure control and hypertension pathogenesis. The purpose of this study was to investigate the association between single nucleotide common polymorphisms (SNPs) of cytochrome *P450* genes such as *CYP2C8* (*rs7909236* and *rs1934953*), *CYP2C9* (*rs9332242*) and *CYP2C19* (*rs4244285*) with susceptibility to essential hypertension (EH) in the Russian population.

Methods:
The material for this study included DNA samples obtained from 301 unrelated patients with EH and 388 healthy individuals of Russian nationality, predominantly living in the Kursk region. Genotyping of SNPs was performed using the MassARRAY 4 system at the core facility of medical genomics in the Research Institute of Medical Genetics.

Results:
Genotype distributions of all SNPs were in agreement with Hardy-Weinberg equilibrium. No significant differences were observed between the case and control groups with regard to all studied SNPs ($P > 0.05$). However, there was a tendency in the association between genotype CC of SNP *CYP2C8* (*rs1934953*) and decreased risk of EH in females ($P = 0.09$).

Discussion & Conclusion:
Our preliminary results showed that the investigated gene polymorphisms are not associated with EH susceptibility in the Russian population. Further studies with larger sample size are required to substantiate the roles of genes *CYP2C8*, *CYP2C9* and *CYP2C19* in the development of hypertension in Russians. The study was supported by the Russian Science Foundation (№15–15–10010).

BSTR-23

Genetic Polymorphisms of Soluble Epoxide Hydrolase and its Susceptibility to Essential Hypertension in Russians from Central Russia

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Background & Hypothesis:
Epoxyeicosatrienoic acids (EETs), important endogenous regulators of vascular homeostasis, are produced from arachidonic acid via cytochrome P450 epoxygenases. Biological actions of EETs are regulated through their metabolism to dihydroxyeicosatrienoic acids via the enzyme soluble epoxide hydrolase (*EPHX2*). The purpose of this study was to investigate whether single nucleotide polymorphisms (SNPs) such as *rs751141*, *rs4149253* and *rs1042064* of the *EPHX2* gene are associated with essential hypertension (EH) risk in Russian population.

Methods:
The study population included 301 unrelated Russian patients with EH and 388 healthy subjects predominantly living in Kursk region. Genotyping of SNPs was performed using the MassARRAY 4 system at the core facility of medical genomics in the Research Institute of Medical Genetics.

Results:
Genotype distributions of all SNPs were in agreement with Hardy-Weinberg equilibrium and were comparable with those reported in European populations. We found that genotype GA (*rs4149253*) was associated with increased risk of EH (OR: 1.59; 95% CI: 1.00-1.51) but at a borderline statistical significance ($P = 0.05$). Sex-stratified analysis showed that the association occurs only in females (OR: 2.15; 95% CI, 1.05-4.42; $P = 0.03$). SNPs *rs751141* and *rs1042064* did not show significant association with hypertension susceptibility ($P > 0.05$).

Discussion & Conclusion:
Our preliminary finding suggests that *rs4149253* of *EPHX2* could be a susceptibility locus for EH, at least in Russians. SNP function prediction analysis revealed that this polymorphism has a regulatory potential due to the presence of ESE or ESS splicing sites influencing *EPHX2* gene expression.

BSTR-24

A Study on the Association Matrix Metalloproteinases Gene Polymorphisms with Susceptibility to Ischaemic Stroke in Russians from Kursk Region

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Background & Hypothesis:
A number of evidences for the pathological roles of matrix metalloproteinases (MMPs) in cerebrovascular diseases have made genes encoding MMPs attractive candidates for the development of ischaemic stroke (IS). The purpose of this study was to investigate the association of 2 common polymorphisms such as *rs243865* of MMP2 and *rs2276109* of MMP12 with the risk of ischaemic stroke in Russians from Kursk region.

Methods:
A total of 358 unrelated Russian individuals from the Kursk region, including 145 IS patients and 213 age- and sex-matched healthy individuals were recruited for this study. The polymorphisms were genotyped using the MassARRAY 4 system at the core facility of medical genomics in the Research Institute of Medical Genetics.

Results:
Genotype frequencies of the studied polymorphisms were in agreement with Hardy-Weinberg equilibrium in both groups ($P >0.05$). Genotype frequencies of *rs243865* were 59.0% (CC), 39.3% (CT) and 1.6% (TT) in IS patients and 58.8% (CC), 37.5% (CT) and 3.7% (TT) in healthy controls. Genotype frequencies of *rs2276109* were 65.6% (AA), 31.1% (AG) and 3.3% (GG) in cases and 72.36% (AA), 25.0% (AG) and 2.7% (GG) in controls. No differences were found between the case and control groups with regard to the frequencies of alleles and genotypes of the studied polymorphisms.

Discussion & Conclusion:
Our preliminary results demonstrate that polymorphisms *rs243865* of MMP2 and *rs2276109* of MMP12 are not associated with IS susceptibility in this population. The study was supported by the Russian Science Foundation (№15–15–10010).

BSTR-25

A Joint Contribution of Gene Polymorphisms *-511C>T IL1* and *-174G>C IL6* and Cigarette Smoking to the Development of Acute Pancreatitis in Russians

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Background & Hypothesis:
Acute pancreatitis (AP) is multifactorial disease determined by a complex interaction of multiple genes and environmental factors. It is well known that cytokine cascade activation plays an important role in the pathogenesis of AP. The aim of this study was to investigate the relationship between gene polymorphisms—*511C>T* (*rs16944*) of interleukin-1 (IL1) and *-174G>C* (*rs1800795*) interleukin-6 (IL6) and AP risk in a Russian population.

Methods:
DNA samples from 297 unrelated AP patients hospitalised in surgical divisions of the city of Kursk over a period of 2012 and 2015 were included in the study. A total of 238 unrelated Russian individuals without gastrointestinal diseases were served as a control group. The diagnosis of AP was established using clinical, laboratory and instrumental methods. Genomic DNA was genotyped for these SNPs using TaqMan-based assays.

Results:
The average age of patients was 48.9 + 13.1 years while that of the healthy (control) persons was 47.8 + 12.1 years. A genotype combination *-511CT IL1* x *-174GC IL6* was found to be associated with increased risk of AP (OR: 2.25, 95% CI, 1.45-3.49; $P = 0.002$). In comparison with non-smokers, smoker patients with genotype *511CT* were more prone to the disease development (OR: 2.22; 95% CI, 1.3-3.79; $P = 0.003$).

Discussion & Conclusion:
The study findings demonstrate that interaction between *-511C>T IL1* and *-174G>C IL6* in combination with cigarette smoking are important contributors to the pathogenesis of acute pancreatitis in Russians. Further studies are required to substantiate the mechanisms underlying the observed associations.

BSTR-26

Searching for Interactions between Genes Encoding Xenobiotic-Metabolising and Antioxidant Defense Enzymes in Idiopathic Male Infertility

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Background & Hypothesis:
Interindividual differences in the ability to activate and detoxify environmental chemicals are attributed to the genetic variability in xenobiotic-metabolising (XME) and antioxidant defence (ADE) enzymes, making them important modifiers of differential susceptibility to male infertility. In this study, we investigated gene-gene interactions underlying susceptibility to idiopathic male infertility (IMI).

Methods:
A total of 430 unrelated Russian men (203 IMI patients and 227 fertile men) were recruited. Genomic DNA was genotyped for polymorphisms using PCR-RFLP and TaqMan-based assays. Interactions between genes were investigated through logistic regression analysis and multifactor-dimensionality reduction (MDR) method, a powerful bioinformatic tool for the analysis of high-order gene-gene and gene-environment interactions.

Results:
Among 64 genotype combinations significantly associated with male infertility risk, gene-gene interactions between the *CYP1A1, GSTT1, EPHX1, CYP2E1* (*rs3813867*), *GSTP1* (*rs1695*), *GSTM1* (deletion), *NAT2* (*rs1799929, rs1799930*) and PON2 loci showed mostly strong associations ($P \leq 0.001$) with disease susceptibility. The MDR method showed high-order epistatic interactions between XME and ADE genes in IMI: we obtained the best three-locus model for gene-gene interactions between the *GSTP1 I105V, ABCB1 3435C>T* and *NAT2 481C>T* loci at a maximum cross-validation consistency of 100% at a permutation *P* value of 0.01.

Discussion & Conclusion:
The gene-gene interaction approach used in this study proved fruitful in uncovering the polygenic basis of male infertility, demonstrating that complex interactions between XME and ADE genes are collectively involved in the molecular mechanisms of male infertility.

BSTR-27

Allele and Genotype Frequencies of Genes Encoding Vascular Endothelial Growth Factors and their Receptors in a Population of the Central Russia

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Background & Hypothesis:

Aberrant regulation of angiogenesis determined by vascular endothelial growth factors (VEGF) is a fundamental process found in several pathologic conditions, including cardiovascular diseases. The study was designed to investigate allele and genotype frequencies in single nucleotide polymorphisms (SNP) of genes encoding VEGF and their receptors in a population of central Russia.

Methods:

A total of 1111 unrelated Slavic individuals from central Russia were included for the study. All DNA samples were genotyped for 6 SNPs such as *rs3025039* (*VEGFA*), *rs2010963* (*VEGFA*), *rs9582036* (*VEGFR1*), *rs9943922* (*VEGFR1*), *rs7664413* (*VEGFC*) and *rs3775194* (*VEGFC*) using the MassARRAY 4 system at the core facility of medical genomics in the Research Institute of Medical Genetics (Tomsk, Russia).

Results:

Genotype frequencies of all studied SNPs were in agreement with Hardy-Weinberg equilibrium and were comparable with those reported in other European populations ($P > 0.05$). Allele and genotype frequencies for SNP *rs3025039* were 13% (T), 74.3% (CC), 25.0% (CT) and 0.7% (TT); for SNP *rs2010963* were 27% (C), 54.4% (GG), 38.1% (GC) and 7.6% (CC); for SNP *rs9582036* were 33% (C), 45.0% (AA), 45.0% (AC) and 9.9% (CC); for SNP *rs9943922* were 53% (C), 24.5% (TT), 46.0% (TC) and 29.5% (CC), for SNP *rs7664413* were 20% (T), 64.1% (CC), 31.8% (CT) and 4.1% (TT); for SNP *rs3775194* were 38% (C), 38.6% (GG), 46.8% (GC) and 14.6% (CC).

Discussion & Conclusion:

The data can be used as reference values for genetic studies in cardiovascular diseases in Russia. The study was supported by the Russian Science Foundation (№15–15–10010).

BSTR-28

Identification of Homozygous Pathologic *TGM1* Mutation in 3 Consanguineous Marriage Families from a Clustered Population in Northern Malaysia

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Background & Hypothesis:
Autosomal recessive congenital ichthyosis (ARCI) is heterogeneous group of ichthyosis with 9 causative genes identified to date. A large part of ARCI cases are due to lamellar ichthyosis (LI) which is caused by mutations in TGM1. We performed genetic analyses in 4 patients with LI from 3 families whereby all are consanguineous marriages originating from the same district in north Malaysia.

Methods:
Mutation analyses were performed by PCR and direct sequencing. Possible large deletions were examined by qPCR.

Results:
We detected homozygous mutation *g1166a* (*Arg389His*) in the *TGM1* gene in all 4 patients. None of the patients showed large deletions in the *TGM1* gene by qPCR. The *Arg389His* has previously been reported in LI patients from the US and Japan. The mutation in the highly conserved residue located in the centre of the core domain of TGase 1 peptide, close to the active sites, has been predicted to lead to serious loss of TGase activity.

Discussion & Conclusion:
This is the first report on the detection of a homozygous *TGM1* mutation among LI patients from consanguineous marriages in a clustered population in Malaysia. The result of this study highlights the need for public education on the risks of consanguineous marriages. Further studies may reveal the prevalence of this mutation in the same ethnicity nationwide as well as the region.

BSTR-29

The *hOGG1 Ser326Cys* Polymorphism and Pathospermia

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Background & Hypothesis:
Increasing the intensity of free radical processes is seen as the leading cause of damaging the processes of spermatogenesis. 8-Hydroxyguanine is a mutagenic base lesion produced by reactive oxygen species. Oxidative stress generates 8-hydroxy-2'-deoxyguanine (8-oxodG), which can structurally modify DNA. *hOGG1* gene located on chromosome 3 encodes a DNA glycosylase/apurinic-apyrimidinic lyase that catalyses the excision and removal of 8-oxodG adducts. In the past years, the *hOGG1 Ser326Cys* polymorphism has attracted widespread attention.

Methods:
The study included 118 patients with various forms of pathospermia. Genomic DNA was isolated from spermatozoa. A DNA fragment containing part of the 5′ untranslated region and the full region of exon 1 was amplified with the primers: Forward, *5'-AGG AGG TGG AGG AAT TAA GT-3'* and reverse, *5'-GGC TTC TCA GGC TCA GTC A-3'.*

Results:
The analysis revealed that oligospermic men presented *hOGG1 326 S/S* genotypes less frequently than normospermic men ($P < 0.001$), whereas the *hOGG1 326 C* allele were significantly increased in oligospermic men ($P < 0.005$). Asthenospermic men *hOGG1 326 S / S* genotype increased more than that of men with normospermia. Men with reduced sperm mobility had reduced the frequency of the mutant allele *hOGG1 326 C* compared with normospermia (0.12 and 0.17, respectively).

Discussion & Conclusion:
Our results suggest that *hOGG1 Ser326Cys* polymorphism is associated with quantitative indicators of semen and not with sperm motility. This study was carried out using the equipments at the centre for collective use of high technology and supported by the federal assignment №6.703.2014/K from Russian Ministry of Science and Education.

BSTR-30

IL-1β Expression in Chorionic Tissue and Decidua of Women with Pregnancy Loss at the First Trimester

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Background & Hypothesis:
The pathophysiology of pregnancy loss is complicated and poorly understood. Immunity, angiogenesis, and apoptosis-related genes are involved in pathogenesis. The imbalance of cytokines and growth factors can negatively affect pregnancy. To further investigate the role of cytokines in spontaneous abortion, we measured the *IL-1β* gene expression in chorionic tissue and deciduas.

Methods:
Samples of tissues were taken after surgical termination by curettage of normally progressing pregnancies and spontaneous abortion between 5-9 weeks of gestation. Villous samples from the control group were obtained from women undergoing elective abortion for social reasons. Total RNA was extracted. Estimation of expression level of analysed gene was performed by RT-qPCR method.

Results:
The expression of *IL-1β* differs for chorionic and decidual tissues under the condition of normal gestation. Compared with chorionic tissue, the expression of *IL-1β* was statistically increased in decidual tissue under the condition of normally progressing pregnancy ($P = 0.001$). *IL-1β* expression in samples of both tissues in spontaneous abortion is equal. Compared with the control group, the expression of *IL-1β* was increased in decidual (4.4 fold; $P = 0.024$) and chorionic (22.6 fold; $P = 0.016$) tissues in cases of spontaneous abortion.

Discussion & Conclusion:
The high level of *IL-1β* expression in chorionic and endometrial tissues may predispose to recurrent miscarriage through a perturbed maternal immune response, effects on decidual tissue remodelling and angiogenesis, or dysregulated trophoblast differentiation and invasion. This study was carried on the equipment of Center for collective use "High Technology" and supported by the federal assignment №6.98.2014/К from Russian Ministry of Science and Education.

BSTR-31

Genotype-specific Cytokine Response of Human Cells to the Effects of Hydrogen Peroxide

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Background & Hypothesis:
Intensity and duration of cytokine activity may determine cellular redox status and course of pathological processes. We investigated the H_2O_2-induced pro- and anti-inflammatory cytokines profile in cultures of human peripheral blood lymphocytes in interrelation with genotype features of cells such as allelic variants of cytokine genes.

Methods:
Blood cells were cultured in an artificial medium which contained RPMI-1640, human serum, phytohemagglutinin. 10 mM H_2O_2 was used as an external adverse effect. Cellular redox state was defined by measuring of the quick flash intensity and the light sum of chemiluminescence. Concentration of *IL-1*, *IL-6*, *IL-10*, *TNF-a* was measured by using ELISA. Allelic variants of cytokine genes (*rs1143627*), (*rs1800795*), (*rs1800872*), (*rs1800871*), (*rs1800896*), (*rs1800629*) were identified by using allele-specific PCR.

Results:
The balance between pro- and anti-oxidant components (r = 0,908, *P* <0,05) has been identified. The addition of H_2O_2 increased the concentration of *IL-6* and TNFa in fluid medium in comparison with the control group (*P* <0.05). It was found that there is an association between the presence or absence of a polymorphic variant of the *IL-10* (*rs1800872*) and the level of *IL-6*.

Discussion & Conclusion:
The main function of *IL-10* is to inhibit an excessive synthesis of pro-inflammatory cytokines. According to this study, the presence of polymorphic variant *IL-10* gene correlates with decreasing *IL-6* concentration. Polymorphic variants of cytokine genes change the functioning of the interconnected and interdependent cytokine system and determine the individual character of the cell's reaction to external stimuli. Thereby, genotype-specific cytokine response of cells to external stimuli is not in doubt. This study was carried on the equipment of Center for collective use "High Technology"

BSTR-32

VEGFA and *TGFβ1* Expression in Chorionic Tissue and Decidua of Women with Pregnancy Loss at the First Trimester

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Background & Hypothesis:
Early stages of placenta development are dependent on vascular development. *VEGFA* and *TGFβ1* are essential for the development of maternal and placental vasculation in pregnancy. The aim of the study is to determine the expression level of the growth factors of genes in chorionic and decidual tissues during pregnancy.

Methods:
Samples of tissues were taken after the surgical termination of normally progressing pregnancies (abortion for social reasons) and spontaneous abortion in 5-9 week of gestation. Total RNA was isolated. *VEGFA* and *TGFβ1* expression levels were performed by the RT-qPCR method.

Results:
VEGFA expression in samples of both tissues in the control group is equal. Compared with chorionic tissue, the expression of *TGFβ1* increased in decidual tissue under the condition of normally progressing pregnancy ($P = 0.003$). The *VEGFA* expression level correlated with *TGFβ1* expression ($P = 0.038$). There was no difference in the *VEGFA* level of expression in decidua and chorionic tissue under the condition of normal pregnancy compared to spontaneous abortion. *TGFβ1* expression in samples of both tissues in spontaneous abortion is equal. The positive dependence was determined for the level of mRNA *VEGFA* and *TGFβ1* in normal pregnancy (r = 0.6, $P = 0.038$). The ratio of mRNA levels was changed in decidua (r = -0.76, $P = 0.028$) under the condition of pregnancy loss.

Discussion & Conclusion:
Our findings show that a change of ratio between the *VEGFA* and *TGFβ1* expression levels in decidua can be associated with spontaneous abortion in the first trimester of pregnancy. This study was carried on the equipment of Center for collective use "High Technology" and supported by the federal assignment №6.98.2014/К from Russian Ministry of Science and Education

BSTR-33

The Search for MicroRNA Targets in the Rhox Family of Homeotic Genes for Fertility and Gametogenesis Regulation

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Background & Hypothesis:
Homeotic genes are genes which regulate growth and differentiation processes in an organism. Homeotic genes are important in fertility and gametogenesis. In homeotic genes, clusters are common non-coding RNAs. The aim of this work was to study the micro RNA localisation in the Rhox family of homeotic genes and clusters in cis-regulatory regions.

Methods:
The cis-regulatory regions of Rhox of homeotic genes are *Rhox1*, *Rhox2*, *Rhox2b,* and they were obtained from the NCBI Gene database. MiRNA sequences were obtained from the miRBase. Bio-informatic search was carried out using Mscanner, a miRTarBase software. The similarity index minimum was 0.85.

Results:
A total of 45 different types of sites in homologous mature micro RNA, 23 sites in homologous pre-micro RNAs in the surrounding area of the *Rhox1* family gene, 8 sites in mature micro RNA, and 6 sites pre-micro RNA in the surrounding area of the *Rhox2*, *Rhox2b* family genes were found. Mir-7053 localised in exon *Rhox2* and *Rhox2b* family genes enabled simultaneous regulation of these genes. The cis-regulatory regions of genes discovered 13 copies of *hsa-mir-3929*. The *hsa-mir-3929* is involved in the regulation of female reproductive cycle in humans as shown in the analysis of the miRTarBase database.

Discussion & Conclusion:
The MicroRNA collection further studied the regulation of proliferation and differentiation processes in germ cells, obtaining *mir-3929*, *5096-mir*, *mir-1268*, and *mir-466i*, *mir-619*, *mir-1273*, *mir-5096*, *mir-3473*, *mir-3929*, *mir-566*. Analytical work was carried out on the equipment of Center for collective use High Technology of SFedU. This research was supported by the Ministry of Education and Science of Russia №6.703.2014/K.

BSTR-34

Mir-17 MicroRNA Family in the Gonadotropins Regulation

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Background & Hypothesis:
The primordial germ cells and spermatogonia maximum number of RNA molecules are represented by the mir-17 microRNA family. Molecules of *mir-17* microRNA family regulate differentiation, apoptosis and proliferation of primordial germ cells. In non-obstructive azoospermia, we observed a significant reduction in the number of molecules of *mir-17* microRNA family. Gonadotropnye hormones secreted by the anterior pituitary gland-luteinising hormone and follicle-stimulating hormone play key roles in the hormonal control of spermatogenesis. The purpose of the study is to analyse the frequency of mir-17 microRNA family prevalence in the intergenic space and introns of gonadotropins.

Methods:
Gonadotropins were obtained from the NCBI Gene database. Sequences of the *mir-17* microRNA family were obtained from the miRBase. Bioinformatic search was carried out using Mscanner software. The similarity index minimum was 0.85.

Results:
The length of the intergenic space of luteinising hormone beta is 1212 bp, follicle stimulating hormone (CGA – 95368 bp, beta – 315057 bp) and thyroid stimulating hormone beta is 48156 bp. The *Pma-mir-17a* was detected in the intergenic space after follicle-stimulating hormone alpha gene, and the *oan-mir-106* was detected in intergenic space after follicle-stimulating hormone beta gene. The intergenic space of genes luteinising hormone and thyroid stimulating hormone do not include genes from the *mir-17 microRNA* family.

Discussion & Conclusion:
The results indicate the potential involvement of genes from the *mir-17* microRNA family in the expression and suppression of gonadotropins and regulation of gametogenesis processes. Analytical work was carried out on the equipment of Center for collective use High Technology of SFedU. This research was supported by the Ministry of Education and Science of Russia №6.703.2014/K.

BSTR-35

Oxidative Status Markers in the Diagnosis of Pathospermia

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Background & Hypothesis:
The main mechanism of male reproductive disorders is oxidative stress causing the generation of reactive oxygen species. The purpose of this study was to investigate the interactions between different allelic variants of the antioxidant defence system genes and male infertility.

Methods:
The materials for the study consisted of 88 semen samples. Allelic variants of catalase gene (*C1167T; rs769217*) and superoxide dismutase gene (*G7958A; rs4998557*) were identified by using allele-specific polymerase chain reaction.

Results:
There were no associations between mutant allelles and suppression of the spermatogenesis. But in a result of combined evaluation, the significant correlation between a combination of these alleles and suppression of the spermatogenesis was found (OR: 11.7; 95% Cl, 1.34-35, 734; *P* = 0.0077). Investigations reveal the negative effects of reactive oxygen radicals on the quality of sperm, such as breaches on the flagellum and acrosome, lesion of the cytoplasmic membrane symmetry, and increased fragmentation of deoxyribonucleic acid.

Discussion & Conclusion:
Based on the literature and results of our study, we suggest that polymorphic variants of antioxidant defence systems can lead to insufficient function of superoxide dismutase and catalase, which in turn will lead to the overproduction of reactive oxygen species. This process can cause idiopathic male infertility. This study was carried on the equipment of Center for collective use "High Technology" and supported by the federal assignment No 6.703.2014/K from Russian Ministry of Science and Education.

BSTR-36

Cortexin and Pinealon Modulate Free Radical Processes in Patients' Blood that Have Different Levels of Glycated Haemoglobin in an In Vitro Model

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Background & Hypothesis:
The aim of this work was to study the influence of cortexin and pinealon on free radical processes' (FRP) indices in the blood of patients with different levels of glycated haemoglobin in in vitro models.

Methods:
The blood of patients with level of HbA1 4,2-6,1 or 6,2-12 was incubated, and a series of experiments were held: 1) 100 µl of physiologic saline (PS) were added to the blood; 2-5) 100 µl of PS containing either cortexin or pinealon in dosages of 10 or 20 ng/µl were added to the blood. The levels of HbA1, outer-erythrocytic hemoglobin (OEH, eq.un.) and the indices chemiluminescence (ChL, H&Sm) were identified.

Results:
Cortexin tested in blood with level of HbA1 4.2-6.1 reduces H and the concentration of OEH. Introduction of cortexin in dosages of 20 ng/µl to blood with level of HbA1 6.2-12.0 forwards lead to a rise in FRP intensity. Introduction of pinealon in blood with level of HbA1 6.2-12.0 forwards lead to a rise in OEH level against the background of Sm rise. Both cortexin and pinealon, introduced in blood in dosages of 10 ng/µl, decreased ChL indices.

Discussion & Conclusion:
Therefore, the effects of cortexin and pinealon have a dosage-dependent disposition, probably influencing the free radical processes in blood of patients with different levels of glycated haemoglobin, due to the chemical structure of these drugs. This study was carried on the equipment of Center for collective use "High Technology" and supported by the Federal Assignment No 1878 from Russian Ministry of Science and Education.

BSTR-37

Influence of Pinealon on the Behaviour of Diabetic Rats

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Background & Hypothesis:
The aim of this work was to study the influence of pinealon on maintaining the formed reflex in rats within a model of diabetes.

Methods:
The navigational education of rats was held in the Morris labyrinth. After forming reflex, 3 groups of rats were introduced to pinealon in dosages of 10, 100 or 200 ng/100 g. After that, the diabetes was modelled by a single-introduction of alloxan in dosages of 17 mg/100 g. On the thirtieth day after the last test in the Morris labyrinth, rats with developed diabetes were analysed on their maintenance index of formed reflex.

Results:
On the thirtieth day after the last test in the Morris labyrinth, a control group and the group of rats within the model of alloxan diabetes, there was no change in the time taken to reach the platform compared to the level on the third day of reflex forming. The introduction of pinealon in dosages of 100 ng/100 g within the model of alloxan diabetes resulted in the 50% decrease in time taken to reach the platform ($P <0.05$).

Discussion & Conclusion:
Therefore, alloxan diabetes of decompensated form is not a factor that considerably influences the maintenance of formed reflex. In addition, it has been experimentally established that pinealon has a prolonged effect on the storage function and a dose-dependent effect. This study conducted as part of the base part of the state order of the Ministry of Education and Science of the number of R & D in 1878 "Development of the fundamental aspects of molecular diagnosis of mitochondrial and pharmacology.This study was carried on the equipment of Center for collective use "High Technology" and supported by the Federal Assignment No 1878 from Russian Ministry of Science and Education.

BSTR-38

Developing an Algorithm that Assesses the Occurrence of Fetal Macrosomia in the Early Stages of Pregnancy for a Decision Support System

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Background & Hypothesis:
The large fetus formation is multifactorial in nature. It is important to develop an algorithm that can assess the occurrence of fetal macrosomia in the early stages of pregnancy by taking into account the weight of endocrine status biomarkers and physical signs in the formation of macrosomia.

Methods:
The serum of pregnant women with fetal macrosomia was retrospectively studied. Biomarkers of endocrine status (TSH, HCG, leptin, thyroxine, cortisol, insulin, prolactin, estradiol, progesterone, ghrelin, growth factors such as PlGF, GDF-15 and IGF-BP-1) of the pregnant female and the fetus at first, second and third trimesters were studied. Statistically significant evidence of selection and a combined list of the most significant were assessed by the receiver operating characteristic analysis method.

Results:
The algorithm to assess the occurrence of fetal macrosomia in the early stages of pregnancy for a decision support system is based on the weighting factors of GDF-15 levels, IGF-1, thyroxine, leptin and weight of the pregnant female.

Discussion & Conclusion:
The decision support system is proposed for practical use by physicians in healthcare so that perinatal loss, severe maternal and fetal injuries, and disability indicators of children can be reduced, thus, bringing positive health and economic benefits. Analytical work was carried out on the equipment of Center for collective use High Technology of SFedU. This research was supported by the Ministry of Education and Science of Russia №6.703.2014/K.

BSTR-39

Searching MiRNA Binding Sites in Metalloproteinase and Folate Cycle Genes

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Background & Hypothesis:
A bioinformatic search on miRNA methods allows to predict pre-miRNAs involved in the candidate genes of expression regulation during the development of atherosclerosis and determine their binding sites and the degree of binding to its target. The aim of this research was to determine and search miRNA binding sites in metalloproteinase and folate cycle genes during the development of atherosclerosis.

Methods:
The sequence of the matrix metalloproteinases genes (*MMP1*, *MMP3*, *MMP9*) and folate cycle genes (*MTHFR*, *MTRR*) were obtained from NCBI (http://www.ncbi.nlm.nih.gov/) using a set of scripts, IFITCH, which is designed for automatic data acquisition. MiRNA sequences were obtained from the miRBase website (http://mirbase.org/). Target for siRNA were taken from the miRTarBase website (http://mirtarbase.mbc.nctu.edu.tw/). Auto search of binding sites was carried out with Mscanner software. The results were filtered to yield the matches with 90% identical nucleotides.

Results:
MiRNA revealed the similarity index of minimum above 0.85. for *MMP1* gene—*hsa-mir-619*, *hsa-mir-3611* and *hsa-mir-5095* - 3 copies; for the *MMP9* gene—*hsa-mir-619* - 2 copies, *hsa-mir-1227*, *hsa-mir-1273g*, *hsa-mir-6800*, *hsa-mir-7155*, gene *MTRR*—*hsa-mir-574*, *hsa-mir-619* - 2 copies, *hsa-mir-4297*, *hsa-mir-1273g*, *hsa-mir-8485*. There were no miRNA revealed with a similarity index above 0.85 for *MMP3* and *MMP3* genes.

Discussion & Conclusion:
Hsa-mir-619 was detected in *MMP1*, *MMP9*, *MTRR* genes. These genes revealed a different number of polymorphisms for miRNA. The minimum number of SNPs was 1 (*hsa-mir-1273g*, *hsa-mir-574*, *hsa-mir-7155*, etc.), and the maximum number of polymorphisms have been found in the miRNA *hsa-mir-4297* and it was 8. This research was supported by the internal grant of the Southern Federal University №213.01-2015/003VG «The study of protein noncoding DNA elements in the structure of different genomes».

BSTR-40

The Association between HIF-1 and VEGFA Genes Polymorphisms and In Vitro Fertilisation Efficiency in Humans

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Background & Hypothesis:
The contribution of genetic factors to reproductive disorders is up to 20%. *HIF-1α* and *VEGFA* genes regulate the processes of implantation and angiogenesis. This study determines the significance of the allelic variants of *HIF-1α* and *VEGFA* genes in patients' implantation pathogenesis during an in vitro fertilisation (IVF) programme with infertility of different genesis.

Methods:
Venous blood samples were obtained from 84 patients (43 couples) with infertility diagnosis. All patients gave a written informed consent to participate in the study. After undergoing IVF cycles, patients with increased chorionic gonadotropin (10 couples) were included in the control group, while patients with hCG less than 10 (33 couples) formed the study group. Polymorphisms *HIF-1α* (*rs11549465*) and *VEGFA* (*rs2146323*) were detected by allele-specific polymerase chain reaction method using SNP-express reaction kits (Syntol, Russia).

Results:
Among the control group of patients whose heterozygotes for polymorphisms of *HIF-1α* were not identified, ratio of C/C and T/T homozygotes was 88.9% and 11.1%, respectively. The study group showed 17.5% of heterozygotes, and the ratio of C/C and T/T homozygotes was 74.6% and 7.9%, respectively. For VEGFA in the control group, genotype C/A prevailed (57.2%). Frequency of C/C and A/A homozygous genotypes was accounted with 21.4% each. In the study group, their genotype frequencies were as follows: C/C 33.3%, A/A 35.4%, C/A 31.3%.

Discussion & Conclusion:
Heterozygouse genotype of *HIF-1α* may reduce the chance of embryo implantation while heterozygouse genotype of VEGFA may produce positive effects. This study was supported by the federal assignment №6.98.2014/К from Russian Ministry of Science and Education and carried out Center for collective use High Technology of SFedU.

BSTR-41

MicroRNA Binding Sites in Mitochondrial Genes are Associated with the Progression of Atherosclerosis

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Background & Hypothesis:
Cardiovascular diseases (CVD) represent a major health problem and they are the leading cause of death in developed societies. In recent years, it has been shown that mitochondrial dysfunction plays a key role in the triggering and progression of atherosclerotic lesions. It is shown that microRNA can regulate gene expression at the post-transcriptional level, so, in order to find possible targets for atherosclerosis therapy, we investigated the binding sites in the mitochondrial genome genes across different species of miRNA.

Methods:
A bioinformatic analysis of the mitochondrial genome data was performed. Full sequences of genes and miRNAs were obtained from the NCBI database and miRBase by using E-utilities API release 21. Auto search of binding sites was carried out using Mscanner software. The results were filtered to yield the matches with 90% identical nucleotides.

Results
The results showed MiRNA binding sites have been detected in mitochondrial genes, such as *MT-TRNF* (*hsa-mir-4284*), *MT-RNR2* (*hsa-mir-4485, hsa-mir-1973*), *MT-TRNQ* (*hsa-mir-2392*), *MT-TRNC* (*hsa-mir-4484*), *MT-COX1* (*hsa-mir-6723*), *MT-ND4L* (*hsa-mir-4461*), and *MT-ND5* (*hsa-mir-4463*). The entire set of mitochondrial DNA sequences revealed the relationship between atherosclerosis mutation (13050insC) in *hsa-mir-4463* of *MT-ND5* gene.

Discussion & Conclusion:
The microRNA *hsa-mir-4463* can be considered as a potential candidate that is involved in the regulation of the atherosclerosis progression.This research was supported by the Russian Science Foundation grant No: 15-15-10022.

BSTR-42

Atherosclerosis-on-a-Chip: Study of Leukocyte-Endothelial Interactions in 3-D Stenotic Blood Vessel Perfusion Model

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Background & Hypothesis:
Atherosclerosis is a chronic inflammatory disease characterised by narrowing of the blood vessels due to deposition of low density lipoproteins in the arterial walls, eventually leading to cardiovascular complications including heart attack and stroke. Most of the existing atherosclerosis in vitro models are 2-dimensional (2-D), and fail to reproduce features of atherogenesis including blood flow-induced shear stress and leukocyte-endothelial interactions. Herein, we report a microfluidic biomimetic blood vessel model to study the haemodynamics and leukocyte-endothelial interactions using a tunable, 3-D endothelial barrier to mimic stenotic plaque.

Methods:
A polydimethylsiloxane-(PDMS) based biochip was designed to create a tunable, pneumatic stenotic plaque. FITC dye and 10 µm beads were used to visualise the stenotic plaque and laminar flow profile inside the microfluidic chip, respectively. To mimic inflammation, endothelial cells were treated with TNF-α to study the binding and rolling of monocytes (THP-1) and neutrophils.

Results:
The flow profile (1 dyne/cm^2) varied significantly in the 3-D stenosis region which led to distinct adherence patterns of THP-1 cells at 50% and 80% channel constriction. Moreover, THP-1 adhesion increased 4-folds due to channel constriction. Finally, the device was used to study whole blood perfusion under stenosis conditions. Significant leukocyte (mostly neutrophils) rolling and adhesion were observed, and average leukocyte rolling velocity was lowest with an 80% constriction, due to low shear at the top of the "plaque".

Discussion & Conclusion:
The developed atherosclerosis-on-a-chip mimics a physiologically relevant 3-D stenotic blood vessel. This model can be further developed to study thrombus formation and other endothelial-related dysfunctions in cardiovascular diseases.

BSTR-43

Investigating the Role of Cellular Senescence in Age-related Hair Depigmentation

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Background & Hypothesis:
Every year, millions of dollars are spent on products to delay hair greying or to recolour grey hair, yet we still do not understand the mechanism(s) that cause(s) hair depigmentation. Understanding the mechanism that determines why our hair turns grey is of intellectual and commercial importance. We hypothesise that cellular senescence may contribute to hair greying. Senescence is an irreversible growth arrest and senescent cells accumulate during ageing in many tissues and at sites of pre-neoplastic lesions. However, senescent cells are difficult to detect in vivo.

Methods:
We recently discovered a novel biomarker, "loss of lamin B1", which permits easy identification of senescent cells. Loss of lamin B1 was observed in senescent fibroblasts, keratinocytes and melanocytes in vitro, as well as in chronologically-aged human skin and ultraviolet-exposed mouse skin in vivo.

Results:
To determine whether senescence may contribute to hair greying, we obtained scalp biopsies from individuals with both pigmented and grey hair, and probed these with antibodies against lamin B1 in the different cell populations within the hair follicle. Our results suggest that lamin B1 levels are reduced in the melanocyte compartment of grey (but not pigmented) hair follicles, suggesting that senescence may contribute to hair greying.

Discussion & Conclusion:
Our future work aims to determine how senescence impairs the functionality of melanocytes and keratinocytes, and elucidate what triggers senescence. Understanding the mechanisms resulting in hair depigmentation will allow for the development of translational programmes to target pathways and molecules with a large commercial interest.

BSTR-44

Higher Central Arterial Stiffness Is Independently Associated with Albuminuria Progression: A Prospective Cohort Study of Asians with Type 2 Diabetes

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Background & Hypothesis:
Albuminuria progression has been associated with renal deterioration in type 2 diabetes (T2DM). Central arterial stiffness (CAS) can aggravate systemic vasculopathy by propagating elevated systolic and pulse pressures forward, thereby accentuating global vascular injury. We aimed to investigate whether CAS is an independent predictor for albuminuria progression in a multiethnic T2DM Asian cohort in Singapore.

Methods:
In a prospective cohort, 916 T2DM patients were clinically assessed at baseline and after a median follow-up of 3.2 years (range, 2.0 to 4.1). Patients were divided into progression and non-progression groups according to the changes of urinary albumin-to-creatinine ratio (ACR). Progression was defined as transition from normo- (ACR <30 mg/g) to microalbuminuria (ACR = 30-299 mg/g), micro- to macroalbuminuria (ACR >300 mg/g), or normo- to macroalbuminuria. CAS was estimated by carotid-femoral pulse wave velocity (PWV) using applanation tonometry method. Stepwise multiple regression analysis was used to determine the independent variable(s) related to albuminuria progression.

Results:
Albuminuria progression occurred in 171 patients (18.7%). Baseline PWV was significantly higher in progression (10.2 ± 3.0 m/s) than non-progression group (9.5 ± 2.5 m/s, $P = 0.002$). One standard deviation increase in baseline PWV was associated with albuminuria progression (OR: 2.439; 95% CI, 1.363 to 1.4.363; $P = 0.003$). Stepwise multiple regression analysis identified that baseline PWV (OR: 2.029; 95% CI, 1.088 to 3.785; $P = 0.026$), BMI (OR: 1.051; 95%CI, 1.017 to 1.087; $P = 0.003$), nature log-transformed eGFR (OR: 0.663; 95% CI, 0.455 to 0.967; $P = 0.033$), and medication for angiotensin receptor blockers (OR: 1.765; 95% CI, 1.217 to 2.561; $P = 0.003$) are predictors for albuminuria progression.

Discussion & Conclusion:
Increased CAS at baseline predicted future progression of albuminuria. Our results suggest the potential benefit of ameliorating CAS (e.g. weight management) to retard albuminuria progression in T2DM.

CR-01

The Collaborative Ocular Tuberculosis Study (COTS): Clinical Features and Derivation of a Clinical Risk Score for Ocular Tuberculosis

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Background & Hypothesis:
The re-emergence of tuberculosis (TB) in synergy with the HIV pandemic is projected to cause a surge of extra-pulmonary TB. Ocular TB has significant associated morbidity, manifestation of which often precedes any other evidence of TB infection. However, diagnostic enigma has led to delay and missed diagnosis, with ensuing poorer outcomes and missed opportunities to address TB infection.

Methods:
This was an exploratory retrospective cohort study of patients with ocular TB recruited from 25 international centres between January 2004 and December 2014. Patients with a minimum follow-up of 1 year and treatment with antitubercular therapy (ATT) were included. Kaplan-Meier method with logistic regression was used to identify key clinical features and elastic net regression to derive a clinical risk score.

Results:
A total of 801 out of 962 patients with ocular TB received ATT and were included in this study. Patients had a mean age of 40.5 years (range, 4 to 90) and a predominance of males (51.6%) of Asian ethnicity (73.6%) and geographical origin (61.0%). Most patients presented with bilateral ocular involvement (58.8%) and no symptoms of systemic TB (92.1%). Prevalence of suggestive features, results of corroborative investigations and treatments instituted are described, along with key clinical features predictive of outcomes based on survival analysis and a clinical risk score.

Discussion & Conclusion:
These results provide valuable insight into the diagnosis of ocular TB, and provide data which supports global initiatives towards active case-finding in TB infections. Further prospective study is required to validate this score.

CR-02

To Investigate the Efficacy of Dipeptidyl Peptidase-IV (DPP-IV) Inhibitor Therapy in Multiethnic Asian Patients with Type 2 Diabetes Mellitus

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Background & Hypothesis:
This study aimed to investigate the efficacy of dipeptidyl peptidase-IV (DPP-IV) inhibitor therapy in multiethnic Asian patients with type 2 diabetes mellitus (T2DM).

Methods:
This is a retrospective single-centre study of 343 Singaporeans with T2DM who were started on DPP-IV inhibitor therapy for at least 12 months from January 2014 to May 2015. We examined the changes in glycaemic control (HbA1c) and body weight at baseline and at 12 months after initiation of DPP-IV inhibitor using paired t-test. We examined if changes in HbA1c and body weight differed between ethnic groups by gender (males vs females), DM duration (<10 years vs ≥10 years) or age (<50 years vs ≥50 years) using linear mixed models.

Results:
We enrolled 196 (57.1%) Chinese, 70 (20.4%) Malay and 77 (22.4%) Indians. HbA1c improved at the end of 12 months of follow-up for all 3 ethnic groups (Chinese, Δ-0.43%, *P* = 0.036; Malays, Δ0.66%, *P* = 0.0867; Indians, Δ0.54%, *P* = 0.088). The interaction term ethnicity by follow-up was not statistically significant. There were no statistically significant changes in body weight for all the 3 ethnic groups. Patients who were older than 50 years old had more sustained HbA1c response over the 12-month follow-up compared to patients less than 50 years old. The change in the HbA1c was similar for both genders, and for those with duration of diabetes <10 years and 10 years or more.

Discussion & Conclusion:
A 12-month treatment regimen with DPP-IV inhibitor improves HbA1c similarly in all 3 Asian ethnic groups with T2DM. The improvement in the HbA1c is more sustained for those patients older than 50 years.

CR-03

Impact of Anticholinergic Burden from Medications on Cognition in Schizophrenia

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Background & Hypothesis:
Cognitive impairment is prevalent in people with schizophrenia and is associated with functioning. Anticholinergic medications impair cognition and numerous psychotropic medications, which form the mainstay of treatment in people with schizophrenia, have anticholinergic properties. This study aimed to explore the cognitive impacts of anticholinergic burden in schizophrenia patients.

Methods:
A total of 706 patients with schizophrenia were evaluated on a comprehensive neurocognitive battery. In a previously published study, 4 cognitive measures—general cognitive performance ("g"), executive functioning, fluency/memory, vigilance/processing speed—were derived from factor analysis. Demographic variables and medication data were collected. Two anticholinergic scales, anticholinergic burden scale (ACB) and anticholinergic drug scale (ADS), were adopted to assess the current prescription for its anticholinergic burden. Multiple linear regression was conducted with each cognitive variable as dependent variables and anticholinergic burden score as independent variable. Gender, age, antipsychotic doses, smoking status and duration of illness were included as covariates.

Results:
All cognitive variables were significantly and inversely associated with ACB and ADS after controlling for the covariates. The correlations between ACB and cognitive variables ranged from -0.229 to -0.236 (all $P <0.01$), while the correlations between ADS and cognitive variables ranged from -0.246 to -0.270 (all $P <0.01$).

Discussion & Conclusion:
Anticholinergic burden from medications have a significant impact on general cognition, executive functioning, verbal memory and processing speed. Albeit small, the cognitive impact of medications with anticholinergic activity should not be neglected, especially in people with schizophrenia where cognitive deficits are a key feature of the illness.

CR-04

Physical Function after Hospitalisation in Older Adults with Dementia: Does Frailty Play a Part?

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Background & Hypothesis:
Frailty may accelerate functional decline in dementia. We aim to investigate the association between baseline frailty and functional recovery amongst hospitalised older adults with dementia.

Methods:
A total of 94 consecutive patients with dementia (mean age, 90.16 ± 4.809; 75.5% female) admitted to the Department of Geriatric Medicine were recruited. Premorbid frailty was assessed using FRAIL scale. Functional status was assessed using Katz Index of Independence in activities of daily living (ADL). Data on demographics, comorbidities, severity of illness (SI), and admission diagnosis were collected. Paired-sample t-test comparing discharge relative to premorbid ADL was performed for frail and non-frail groups, with independent sample t-test to compare ADL change at discharge between groups.

Results:
A total of 58 (61.7%) patients were frail. There was no significant difference in age, comorbidities and SI between frail and non-frail groups. Frail patients were significantly more impaired in ADL both premorbidly and at discharge compared with non-frail group (0.93 ± 1.76 vs 2.83 ± 2.97, $P = 0.007$; and 0.54 ± 1.24 vs 1.68 ± 2.42, $P = 0.043$) Both frail and non-frail groups exhibited significant decline in ADL at discharge relative to premorbid (paired-sample t-test: $P = 0.009$ and $P = 0.002$ respectively), with greater decline noted in non-frail group (ADL change: 1.20 ± 2.09 vs 0.45 ± 1.21, $P = 0.63$) There was no significant difference in secondary outcomes of in-hospital mortality, length of hospitalisation and discharge destination.

Discussion & Conclusion:
Functional decline affects both frail and non-frail dementia patients following hospitalisation. Our findings suggest that efforts at post-acute rehabilitation may be needed to reduce premature disability in patients with dementia.

CR-05

Impact of Respiratory Virus Multiplex PCR on Clinical Decision-Making

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Background & Hypothesis:
We examined the impact of respiratory virus (RV) multiplex PCR on guiding appropriate therapy.

Methods:
Respiratory virus multiplex PCRs performed from January 2015 to April 2016 were included. We examined the subset that had influenza detected for antibiotic and antiviral usage patterns. As the turn-around-time is 1 to 3 days, oseltamivir started within that period was considered empirical usage.

Results:
A total of 91 RV multiplex PCR tests were carried out. No virus was detected in 58 (63.7%). Of the 33 positive results, 11 (33.3%) were influenza and a further 9 (27.3%) were rhinovirus. RSV (3), parainfluenza (1) metapneumovirus (4), coronavirus (3) and adenovirus (4) were also identified. Of the 11 cases where influenza was detected, 7 also had in-house influenza PCR with 6 patients giving the same result and 1 negative result. Nine out of 11 (81.8%) were empirically started on oseltamivir and the remaining 2 patients did not receive antiviral therapy. All 11 patients were started on antibiotics and 9 (81.8%) were still on antibiotics 5 days after sending the RV multiplex. Two out of eleven (18.2%) had antibiotics stopped within 5 days, although 1 was due to side effects.

Discussion & Conclusion:
Apart from influenza, most of the viruses detected have minimal impact on patient care in a non-oncological setting. Singleplex influenza PCR would detect these cases just as efficiently and may be more cost-effective. The RV multiplex PCR does not have an effect on initiation of oseltamivir, which is prescribed based on clinical suspicion. It also seems to have limited effect on antimicrobial stewardship. We suggest it be discontinued.

CR-06

Atypical Causes of Community-acquired Pneumonia are Unusual in Adult Inpatients

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Background & Hypothesis:
A causal organism is often not identified in patients admitted with pneumonia. Resources are spent investigating and treating for atypical causes. We wondered whether it might be worthwhile introducing nucleic acid tests to improve detection rates to provide a more personalised therapy. This might improve clinical outcome and reduce costs and toxicity from unwarranted antibiotics. A survey was performed.

Methods:
PCR assays were set up for *Mycoplasma pneumoniae*, *Chlamydophila pneumoniae* and *Bordetella pertussis* as they are considered atypical causes of respiratory illness in the community. A total of 200 respiratory samples submitted to the routine laboratory at Tan Tock Seng Hospital for influenza PCR between 2013 and 2014 were tested. Consecutive samples negative for influenza were selected.

Results:
M. pneumoniae was detected in 3 cases, *C. pneumoniae* in zero cases and *B. pertussis* in zero cases.

Discussion & Conclusion:
This data suggests that the routine use of these assays would not be cost-effective in our population of adult inpatients. Healthcare costs will escalate as new technology becomes available and if its use is unrestricted. Data like this can help guide the menu of tests made available on a routine basis and help to keep costs down. Although *Streptococcus pneumoniae* is the main cause of community-associated pneumonia, convincing medical staff that penicillin alone is an acceptable therapy is difficult. As bacterial resistance in general becomes more and more of a problem, data like this may help push them in this sensible direction.

CR-07

Should Viridans Group Streptococci that Cause Endocarditis be Tested for Gentamicin Susceptibility?

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Background & Hypothesis:
Viridans group streptococci (VGS) are one of the main causes of infective endocarditis. Combination therapy of penicillin with gentamicin is recommended when penicillin MICs are raised as the combination is synergistic, even though all VGS have intrinsic low level gentamicin resistance. The presence of high level (MIC >128 mg/L) gentamicin resistance (HLR) predicts resistance to this synergism but it is not routine practice to test for HLR. We carried out this work to determine whether we should introduce routine testing for HLR.

Methods:
We performed a literature search and consulted the Clinical and Laboratory Standards Institute (CLSI) and the European Committee on Antimicrobial Susceptibility Testing (EUCAST) guidelines.

Results:
CLSI does not recommend testing VGS for HLR; in contrast, EUCAST does. The literature search did not reveal any papers that describe excess mortality or poor outcome in patients with endocarditis with HLR to gentamicin. One review paper commented that "loss of synergy results in slower sterilisation of vegetations and the need for more prolonged antibiotic therapy, and a 2-week regimen is unsuitable when high level gentamicin resistance is found".

Discussion & Conclusion:
Neither CLSI nor EUCAST make their recommendation on HLR testing in VGS based on references. There is a lack of clinical and laboratory data in the literature. Routine practice for enterococci, a related organism, is to test for HLR and adjust therapy accordingly. It seems reasonable to extrapolate practice to VGS. We intend to test for HLR in historic VGS isolates from cases of endocarditis to assess the prevalence of HLR.

CR-08

Trends iPatterns of Scleritis at a Tertiary Referral Eye Care Centre in Singapore

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Background & Hypothesis:
This study aimed to identify the characteristics, clinical features, systemic associations and treatment outcome of scleritis at a tertiary eye centre in Singapore.

Methods:
A retrospective cohort study of the clinical records of consecutive new cases of ocular inflammation that presented to the uveitis subspecialty clinic from 2004 to 2014 at a tertiary referral eye clinic in Singapore was carried out. Data collected included demographics, clinical and laboratory findings, and management. Diagnoses were made based on clinical history, ophthalmological examination and investigations.

Results:
A total of 120 patients with scleritis were identified from a database of 1874 uveitis patients; 56.6% were females, with a mean age of 48.6 +/- 15.9; 69.2% of patients were Chinese, followed by Indians (11.7%), and Malay (11.7%). The disease was unilateral in 69.2% while bilateral in 30.8%; 62.5% had diffuse, 20.8% had nodular, 5.8% necrotising, and 10.8% posterior scleritis. Autoimmune and infective causes were associated with 25.8% and 8.3% of scleritis patients respectively. The most common associated autoimmune cause was rheumatoid arthritis (7.5%), followed by Wegener's granulomatosis (4.2%). Ocular complications included anterior uveitis (42.5%), peripheral keratitis (11.7%), and glaucoma (15.0%). Out of the patients, 53.3% of them were treated with oral corticosteroids while 25.8% were treated with immunosuppressants. Necrotising anterior scleritis was associated with the highest rates of complications, recurrence, and oral corticosteroids and immunosuppressants used for treatment.

Discussion & Conclusion:
Scleritis is a severe ocular inflammation, often associated with ocular complications. The main complications include uveitis, corneal involvement and glaucoma, especially for patients with necrotising scleritis and posterior scleritis. A significant proportion of our patients required systemic corticosteroids or immunosuppressives to control the condition.

CR-09

Outcome of Cardiac Arrest Patients Presenting to the Khoo Teck Puat Hospital Emergency Department over a 3-Month Period

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Background & Hypothesis:
Cardiac arrest (CA) patients frequently present to the emergency department (ED). In this study, we studied retrospectively the outcome of CA patients presenting to the Khoo Teck Puat Hospital (KTPH) ED over a 3-month period from October 2015 to December 2015.

Methods:
Patients with CA presenting to the KTPH ED over a 3-month period from October 2015 to December 2015 were identified from our records of ambulance VHF cases and ED visits diagnosis. Patients in CA were confirmed by unconsciousness, apnoea and no palpable pulse on arrival at the ED. The following CA patients were not included in the study: paediatric (defined as less than 16 years old), traumatic CA, CA patients with no resuscitation performed at the ED (usually in patients with terminal illness or with very poor morbid state) and CA patients that were successfully resuscitated prehospital (had pulse on arrival at the emergency department). Data were retrieved from the ambulance, ED and inpatient records.

Results:
A total of 62 patients were identified in this study over the 3-month period. There were 31 males and 31 females. Their age ranged from 17 to 100 years with a median of 64 years. Of the 62 patients, 6 patients (9.7%) were resuscitated successfully in the ED and were admitted to the hospital. None of them, however, survived to leave the hospital.

Discussion & Conclusion:
In this study, none of the patients presenting with CA to the KTPH ED patients survived to leave the hospital. The outcome is extremely poor for patients presenting with cardiac arrest to the ED.

CR-10

Adult Henoch-Schönlein Purpura: Clinical and Histopathological Predictors of Systemic Disease and Profound Renal Disease

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Background & Hypothesis:
A challenge in the management of adult Henoch-Schönlein purpura (HSP) is the difficulty in assessing the risk of systemic involvement. Despite growing interest in investigating predictors of systemic involvement, not many studies have been published in this area and results have sometimes been conflicting. This study sought to determine specific clinical and histopathological features associated with systemic involvement in adult HSP.

Methods:
We reviewed the records of 99 HSP patients who presented at the National Skin Centre between January 2008 and May 2015. Data extracted included demographic and clinical characteristics, as well as histological and immunohistochemical findings.

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%), and gastrointestinal involvement in 13 (13.1%). The occurrences of joint and gastrointestinal involvement were associated with each other (P <0.01). Multivariate analysis demonstrated that age >30 years was an independent predictor for renal involvement, with an adjusted odds ratio of 2.97 (95% CI, 1.08 to 8.16; P = 0.04). Risk factors for significant renal involvement necessitating nephrology referral were further evaluated: the odds were 60% higher for every 10-year increase in age (95% CI, 1.02 to 2.57; P = 0.04), and patients with cutaneous bullae and/or necrosis had 6 times higher risk (95% CI, 1.43 to 25.00; P = 0.01).

Discussion & Conclusion:
Adult HSP patients older than 30 years were 3 times more likely to have renal involvement compared to younger patients. The risk of significant renal disease necessitating nephrology referral increased with age and presence of cutaneous bullae and/or necrosis.

CR-11

Prognosis of Acquired Idiopathic Generalised Anhidrosis

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Background & Hypothesis:
Acquired idiopathic generalised anhidrosis (AIGA) is a rare disorder with significant risk of heat injuries and impairment of quality of life. Treatment options are limited with high-dose systemic steroids as the mainstay. Of pertinence to its management is the knowledge of its natural history and prognosis, for which scarce literature exists. We aimed to elucidate the long-term prognosis of AIGA with a secondary aim of gauging its impact on quality of life.

Methods:
We reviewed the medical records of patients diagnosed with anhidrosis affecting at least 70% of body surface area in the absence of any neurologic or sweat gland dysfunction or other secondary aetiologies, and with 5 years or more between disease onset and last follow-up. Patients were also asked to rate how AIGA affected their quality of life on a scale of 0 to 10 representing minimal to severe impact.

Results:
Thirteen patients were included with a mean age at diagnosis of 24.2 years (range, 15 to 62 years). Five (38.5%) reported spontaneous remission, occurring at a median time of 1 year since disease onset (range, 1 to 17 years). None of the 5 patients reported a relapse at a mean follow-up duration of 4.7 years after remission (range, 1 year 2 months to 7 year 11 months). The rest reported no significant change in their condition. On the question on how AIGA affected their quality of life, the mean rating was 5.7 ± 3.0.

Discussion & Conclusion:
Our results revealed that AIGA is a chronic condition usually lasting years, with spontaneous remission occurring in a significant proportion of patients.

CR-12

Evaluation of Healthcare Staff's Knowledge and Attitudes towards Persons with Advanced Dementia (PWAD) in a Modified Namaste Care Programme

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Background & Hypothesis:
Namaste Care programme was developed to provide PWAD with meaningful activities and a structure to their daily routine through multisensory intervention conducted by healthcare staff. We aim to evaluate the knowledge and attitude towards caring for PWAD amongst healthcare staff participating in this programme.

Methods:
We recruited 10 healthcare staff to participate in the Namaste Care programme in Tan Tock Seng Hospital. Participants were involved in discussions and teaching about dementia. They completed a preprogramme survey using the questionnaire on Palliative Care for Advanced Dementia (qPAD). This was used to assess their knowledge and attitudes towards caring for PWAD. Descriptive statistics were conducted.

Results:
Participants were all female nurses with mean age of 29.8 years (SD: 6.32) years and on average, mean experience of 3.8 years (SD: 1.70) years caring for patients with dementia. Seventy percent of the participants had the misconception that the best way to prevent weight loss in PWAD was to keep them on a restricted diet. Though 70% enjoyed caring for PWAD and 60% frequently discussed with their colleagues on ways to improve care, only 50% felt satisfied when caring for PWAD. Eighty percent felt the need to talk about end-of-life (EOL) care but only 60% felt confident in conducting EOL discussions.

Discussion & Conclusion:
There is a need to improve the knowledge of healthcare staff to address several misconceptions about PWAD. With empowerment of knowledge and delegation of responsibilities through the running of Namaste Care programme, we believe that they will be equipped with the necessary skills to provide better care for PWAD.

CR-13

Anticoagulation versus Catheter-directed Thrombolysis with Stenting in Treating Patients with May-Thurner Syndrome-related Deep Vein Thrombosis

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Background & Hypothesis:
Various acceptable treatment options including anticoagulation and catheter-directed therapies have been used for May-Thurner syndrome (MTS)-related deep vein thrombosis (DVT). This study compares the outcome among the 2 treatment options for MTS-related DVT patients screened in TTSH GM vascular clinic.

Methods:
Eight patients were found to have left lower extremity DVT with MTS, 6 patients were given anticoagulation and 2 underwent CDT with stenting. Five patients were given warfarin and 1 patient was given rivaroxaban. Risk factors were identified and patients were followed up for clinical and/or sonographical improvement.

Results:
All patients were above 60 years old, Chinese and mostly females. Risk factors include: malignancy, long haul flights and traditional medication use. All patients who received anticoagulation therapy were noted to have significant clinical improvement. Four patients had repeat scans, in which 2 showed chronic thrombosis. One patient developed post-thrombotic syndrome (PTS) and 2 patients showed that their d-dimers remained elevated. Among those who underwent CDT with stenting, 1 had re-occlusion thrombosis with thrombolysis through mechanical thrombectomy with stent deployment. One patient had an IVC filter insertion with phlegmasia cerulea dolens, followed by CDT and stent insertion. No periprocedural bleeding was noted. Clinical improvement was documented for both patients.

Discussion & Conclusion:
Based on this study, clinical improvement for both anticoagulation and CDT with stenting groups was generally the same except for 1 patient who developed PTS. It is recommended that a repeat scan be carried out on a larger population and documented clearance of thrombosis in order to validate the results.

CR-14

The Accuracy of Focal Hyperostosis on Computed Tomography Scan as a Means to Identify the Tumour Origin of Sinonasal Inverted Papilloma

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Background and Hypothesis:
Sinonasal inverted papilloma is a benign epithelial tumour of the nasal cavity that is often locally aggressive, recurrent and associated with malignancy. The treatment for it requires correct identification of the tumour origin and complete excision of the tumour. A technique described to locate the tumour origin is the identification of focal hyperostosis on CT scan. Thus, the objective of this study is to evaluate the accuracy of using focal hyperostosis to identify the tumour origin of inverted papilloma.

Methods:
We retrospectively reviewed 23 consecutive cases of inverted papilloma diagnosed and treated in our unit between 2007 and 2014. The CT scans were retrieved and interpreted by a rhinologist through a blinded process. We then analysed the correlation between the suspected site of origin and the intraoperative findings.

Results:
Our results showed that focal hyperostosis was identified in 87% of cases. It had a positive predictive value of 90% when used to identify the gross location of tumour origin. The agreement between focal hyperostosis and intraoperative findings was analysed with Cohen's kappa coefficient to be 0.82, indicating excellent strength of agreement. Focal hyperostosis had a positive predictive value of 75% when used to identify the precise location of tumour origin.

Discussion & Conclusion:
Focal hyperostosis on CT scan is an accurate means of predicting gross location of tumour origin. This preoperative identification of tumour origin is valuable in guiding surgical planning and preoperative counselling.

CR-15

Does the Presence of Rheumatoid Factor and/or Anti-Cyclic Citrullinated Peptide Antibody Positivity Affect the Manifestations of Rheumatoid Arthritis?

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Background & Hypothesis:
Patients newly diagnosed with rheumatoid arthritis are commonly tested for rheumatoid factor (RF) and anti-cyclic citrullinated peptide antibody (ACCP). Patients with ACCP or RF positivity are reported to have worse clinical and radiographic outcomes; however, the presence of ACCP may confound the effects of RF and vice versa.

Methods:
This study was carried out to determine if there were any differences at study baseline in RA patients who were ACCP+, RF+, doubly positive and doubly negative in terms of demographics, clinical (Disease Activity Score-28 [DAS-28]), functional status, quality of life, erythrocyte sedimentation rate (ESR), hand radiographic erosions and use of prednisolone and disease modifying anti-rheumatic drugs (DMARDs).

Results:
A total of 1206 patients, of whom 475 were excluded due to a lack of both ACCP and RF status, were studied. Out of these patients, 491 were ACCP+RF+, 54 were ACCP+, 82 were RF+ and 104 were doubly negative; 24.4% of the ACCP+RF+ patients were in remission (DAS-28 <2.6) compared to 36.6% to 39.4% in the other groups (P <0.05). ESR was higher (40.4 mm/hour) in the ACCP+RF+ group compared to 30.6 to 30.9 mm/hour in the others (P <0.05). The use of prednisolone and number of DMARDs was higher in the ACCP+RF+ group (1.40 + 0.71) compared to the doubly negative group (1.13 + 0.59) (P <0.05). There were no differences in demographics, radiographic erosions, functional status and quality of life scores.

Discussion & Conclusion:
Patients who were ACCP+RF+ had lower remission rates, higher ESR and required more corticosteroid and DMARD treatment at baseline. These did not seem to impact on their functional status, quality of life and radiographic erosions.

CR-16

Hormonal Therapy Reduces Recurrence and Improves Survival in Breast Tumours with Low Oestrogen Receptor Expression

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Background & Hypothesis:
Hormonal therapy is indicated for oestrogen receptor (ER)-positive breast tumours. In 2010, ASCO lowered the positive threshold for ER; tumours with 1% to 9% of cells staining positive are now considered ER-positive. However, it has been suggested that low ER-positive tumours behave more similarly to ER-negative tumours and do not benefit from hormonal therapy. In this study, we aimed to determine the prevalence of tumours with low ER expression and to evaluate the association with clinical outcome.

Methods:
Retrospective review was performed on 2866 women diagnosed with ductal carcinoma in situ (DCIS) or invasive carcinoma from 2001 to 2012.

Results:
Overall, 1938 patients (67.6%) were treated as ER-positive at time of diagnosis. An additional 171 (6%) patients would be considered ER-positive according to the revised threshold. Women with low ER tumours were likely to be younger, premenopausal, of Malay or Indian ethnicity and to have HER2-positive tumours (P <0.05). Hormonal therapy was recommended to 122 patients (71.3%), and these were more likely to have invasive cancer, PR-positive tumours and had undergone surgery (P <0.05). Patients with low ER invasive cancers had a similar outcome to those tumours of at least 10% ER positivity (P >0.05). Hormonal therapy significantly reduced recurrence, particularly that of distant recurrence, among those with low ER positive tumours (P <0.01; OR: 4.53; 95% CI, 0.09 to 0.58) and and conferred an overall survival benefit (P <0.01; OR: 4.58; 95% CI, 0.08 to 0.59).

Discussion & Conclusion:
Hormonal therapy is effective even in tumours with low ER expression.

CR-17

A Randomised Controlled Trial of Thoracic Paravertebral Block for Breast Cancer Surgery

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Background & Hypothesis:
Thoracic paravertebral block (PVB) helps augment pain control after breast cancer surgery and allow a quicker return to function. We performed a randomised controlled trial to evaluate outcomes after PVB.

Methods:
Women, between the ages of 21 and 90 years who were undergoing definitive breast cancer surgery, were eligible. Patients were randomised into 2 groups: one receiving PVB prior to general anaesthesia (GA), and the other receiving GA alone. Outcomes evaluated included pain scores, shoulder mobility, quality of life (QOL) and complications related to PVB.

Results:
A total of 39 women were recruited over a 7-month period; 16 had mastectomy with sentinel lymph node biopsy (SLNB), 9 had mastectomy with axillary clearance (AC), 8 had wide local excision (WLE) with SLNB and 6 had WLE with AC; 1 patient was withdrawn from the study. No complications occurred. Pain scores (visual analog scale) were similar between both groups immediately postsurgery and after 1 and 6 months ($P > 0.05$). Oral analgesia use was less frequent after PVB (36% vs 21%), but not statistically different ($P = 0.48$). Median shoulder pain score (Penn Shoulder Score) was slightly poorer after PVB ($P = 0.01$), but scores were similar at 6 months. Shoulder mobility was better after PVB 6 months postsurgery, though not statistically significant. Median QOL scores at 3 months postsurgery tended to be higher after PVB ($P = 0.96$) and was similar after 6 months.

Discussion & Conclusion:
PVB reduces pain and improves shoulder mobility after breast cancer surgery, but a larger sample size would be needed to evaluate this further.

CR-18

Management of Fractures in Patients with Osteopetrosis – A Case Series of 4 Patients

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Background & Hypothesis:
Osteopetrosis is a group of sclerosing bone dysplasia characterised by diminished osteoclast-mediated bone resorption. We present a series of 4 patients with osteopetrosis who underwent surgical management in our hospital.

Methods:
Four patients with a total of 8 fractures were managed in our hospital from 2007 to 2015. All patients were male in the 20 to 40 years age group and had a history of previous multiple fractures. Majority of fractures involved femur with 1 subtrochanteric; 3 shaft and 1 neck of femur, 3 of them being peri-implant fractures. One patient had humerus and another had patella with fifth metatarsal base fracture. Most of the femur fractures were fixed with plate fixation. Fracture neck of femur was managed with hemiarthroplasty with allograft, plate and cable systems. Humerus fracture and fifth metatarsal fracture were managed with locking plates while patella fracture was fixed with screws.

Results:
Patients with bilateral peri-implant femur fracture had multiple retained broken screws while removing the old implant. Patella fracture fixation was complicated by 1 broken screw and 1 partially inserted screw as they could not withstand the torque generated when inserting the screw in the sclerotic bone. Fifth metatarsal fracture fixation was complicated by delayed infection that needed surgical debridement. All patients had eventually united.

Discussion & Conclusion:
There is a high incidence of intraoperative and postoperative complications in fractures sustained in patients with osteopetrosis including delayed and non-union, broken implants, peri-implant fractures, and infection leading to osteomyelitis. Great caution must be taken while fixing these fractures.

CR-19

Spectrum of Ocular Inflammatory Disease at a Tertiary Referral Eye Care Institute in Singapore – Report 1

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Background & Hypothesis:
We aimed to identify the characteristics of ocular inflammatory disease at a tertiary referral eye care centre in Singapore over a 12-year period, in particular, the epidemiology and classification of ocular inflammation.

Methods:
A retrospective cohort study of the clinical records of consecutive new cases of ocular inflammation that presented to the uveitis and ocular inflammation subspecialty clinic from 2004 to 2015 at a tertiary referral eye clinic in Singapore was carried out. Data collected included demographics, clinical features, diagnosis, laboratory findings and management. Diagnoses were made based on clinical history, ophthalmological examination and investigations.

Results:
A total of 2200 new patients with ocular inflammation were diagnosed from 2004 to 2015. The most common anatomical diagnosis was anterior uveitis (55.9%), followed by posterior uveitis (17.5%), panuveitis (9.6%) and intermediate uveitis (4.7%). In addition, scleritis (6.1%), keratouveitis (2.8%), retinal vasculitis (2.2%) and episcleritis (1.2%) were observed. Aetiology was established in 65.1% of patients, with non-infectious aetiologies (35.2%) being more common than infectious aetiologies (29.9%). The remainder of patients (34.9%) were idiopathic. The most common aetiologies were presumed to be tuberculosis (7.2%), followed by cytomegalovirus infection (6.9%), herpetic infection (6.3%), HLA-B27 associated anterior uveitis (4.2%) and ankylosing spondylitis (3.8%).

Discussion & Conclusion:
Ocular inflammation represents a significant proportion of patients presenting to the tertiary eye clinic. The pattern of ocular inflammation in Singapore has similarities with both Western and Asian populations. Anterior uveitis was most commonly observed, with presumed tuberculosis being the most common aetiology, though non-infectious aetiologies were more common than infectious aetiologies.

CR-20

Analysis and Outcome of 190 Patients with Ocular Toxoplasmosis: A Retrospective Multicentre Study

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Background & Hypothesis:
Toxoplasmosis is the most common cause of infectious posterior uveitis in immunocompetent patients. Its prevalence varies according to geographical locations, as well as the climate and the living habits ranging from 22.5% in the United States to 77.4% in Brazil. Ocular toxoplasmosis is reported to have a higher prevalence in tropical countries, but there is limited demographic disease data comparing the global multiethnic population. We aim to describe the demographics, presenting symptoms, clinical findings and treatment outcomes of ocular toxoplasmosis from this first ever multicentre collaborative ocular toxoplasmosis study.

Methods:
Retrospective analysis of 190 patients diagnosed with ocular toxoplasmosis from 3 study sites (Brazil, India and Singapore) from 1 January 2004 to 31 December 2013.

Results:
There were 93 males and 97 females with a mean age at presentation of 32.83 years. Patients most commonly presented with isolated blurring of vision (36.8%), followed by blurring of vision and floaters (21.1%). Diagnosis was mainly made by a combination of clinical signs and serological (Toxoplasma IgM and IgG) testing (70.0%). Treatment regimens varied largely from monotherapy to multiple combination therapies. The mean time to resolution was 9.38 weeks, with a median follow-up period of 31.0 weeks (range, 1 to 749 weeks). Final visual acuity of ≥20/40 was achieved in 106 patients (74.2%) and 83 patients (43.7%) suffered a relapse.

Discussion & Conclusion:
A typical patient seen would likely be a young female presenting with blurring of vision and/or floaters. Treatment modalities are variable but good visual outcome can be expected in most cases. Study objectives were achieved.

CR-21

Functional Outcomes and Mortality 1-Year Postdelirium: The Impact of Baseline Frailty and Residual Subsyndromal Delirium

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Background & Hypothesis:
Frailty and delirium represent states of vulnerability with risk of adverse outcomes. This study aims to investigate the impact of baseline frailty and incomplete delirium recovery (residual subsyndromal delirium, RSSD) on mortality and functional outcomes in the year following an episode of delirium.

Methods:
We recruited 234 individuals (mean age 84.1 ± 7.4) admitted to a specialised delirium unit. A 20-item frailty index (FI) was derived following a comprehensive geriatric assessment. FI ≥0.25 defined being frail. Data collected included demographics, comorbidities, Delirium Rating Scale-98 (DRS-R98) and illness severity. DRS-R98 severity score ≥13 at discharge defined RSSD. Multiple logistic regression was performed for independent effect of frailty on 12-month mortality. Random effects model was performed to examine the influence of frailty and RSSD on functional outcomes over 12 months.

Results:
Out of the 234 patients, 159 (67.9%) were frail and they were significantly older (85.3 ± 7.4 vs 81.6 ± 6.6, $P <0.001$) and more likely to have RSSD (73.6% vs 37.3%, $P <0.001$) than the non-frail group. Twelve-month mortality was significantly higher in frail individuals (25.9% vs 10.9%, $P = 0.025$), with increased mortality in multiple logistic regression adjusted for age, gender, illness severity and dementia (OR: 2.75; 95% CI, 1.01 to 7.50; $P = 0.048$). In random effects model, RSSD predicted MBI decline over 12 months (coefficient estimate [SE]: -13.5 [4.21], random effects model = 0.001) but frailty was not a significant predictor (coefficient estimate [SE]: -1.69 (4.24), $P = 0.69$).

Discussion & Conclusion:
Whilst frailty confers increased mortality risk, rehabilitation efforts may need to be targeted towards frail patients with incomplete delirium recovery to ameliorate the relentless functional decline postdelirium.

CR-22

Endoscopic Submucosal Dissection: Adoption of Pocket-Creation Method in a Tertiary Centre in Singapore

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Background & Hypothesis:
This study is a retrospective review of a single centre's adoption of pocket-creation method in colorectal ESD.

Methods:
Patients' records from all colorectal ESD cases performed in our institution were selected from June 2014 to January 2016. A total of 55 colonic ESD cases were performed and 9 cases were excluded as they were deemed unsuitable on examination.

Results:
A total of 46 patients underwent colonic ESD in which the average age was 68.4 years (47 to 85 years). Twenty-two cases were done via the pocket-creation method and 24 via hybrid/others. Twelve out of 22 cases achieved complete en bloc resection whereas the remaining 10 cases required endoscopic piecemeal resection (EPMR). The complication rate of the pocket creation method was 4.6% (1/22) versus the hybrid group 8.3% (2/24). The size of the lesion resected in the pocket creation method ranged from 23 to 60 mm x 20 to 55 mm with the largest en bloc resection specimen at 60 mm x 55 mm x 7 mm.

Discussion & Conclusion:
Overall, the pocket-creation method is safe, effective and facilitates submucosal dissection to achieve en bloc resection of colonic lesions. Safety and success rates can be improved via development of new strategies, training system and equipment.

CR-23

Evaluation of Reasons for Non-Compliance with CPAP in the Singaporean Population and Patient Satisfaction Following Uvulopalatopharyngoplasty – An Audit of Practice

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Background & Hypothesis:
Obstructive sleep apnea is a surging health problem with significant impact on long-term health and quality of life. Continuous positive airway pressure has been hailed as the gold standard for the treatment of OSA and is the only intervention proven to reduce cardiovascular risks from OSA. However, CPAP adherence is notoriously suboptimal despite its established benefits.

Methods:
We conducted a retrospective study via a standardised telephone questionnaire of 55 patients who had undergone uvulopharyngopalatoplasty between 2009 and 2015, after failing a trial of CPAP. Preoperative and postoperative polysomnography parameters were compared and correlated with patients' subjective perception of change in functional outcome following surgery.

Results:
Mean apnoea-hypopnoea index of participants was 38.7 and mean body mass index was 25.6. The top 3 reasons for CPAP non-compliance were the perception of CPAP as non-curative and required long-term use, restriction of movement during sleep, and high cost of CPAP mask and machine. Postoperatively, the mean Epworth Sleepiness Scale (ESS) and AHI scores on repeat polysomnography improved in congruence with patients' perception of symptom alleviation and preference for surgery over CPAP use.

Discussion & Conclusion:
In establishing the reason for non-compliance, we are now able to strategise interventions to improve compliance. Uvulopalatopharyngoplasty does provide subjective and objective improvement in functional outcomes.

CR-24

Endoscopic Ultrasound is Superior to CT/MRI in the Detection of Pancreatic Neuroendocrine Tumours in Baseline Assessment of Patients with Multiple Endocrine Neoplasia Type I

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Background & Hypothesis:
Early identification of pNETs is a key element to reducing morbidity and mortality in MEN1 patients. Prognosis is associated with tumour size. Conventional radiology is suboptimal in detecting such lesions. We compared linear-EUS detection of pNETs in patients with confirmed MEN1 vs triple-phase contrast-enhanced CT/MRI pancreas.

Methods:
A total of 20 patients with clinically confirmed MEN1 underwent baseline assessment with EUS, CT/MRI and biochemical screening. Data were retrospectively retrieved from the hospital database. Statistical analysis was performed via SPSS v20 using the Wilcoxon signed rank test and McNemar chi-square.

Results:
A total of 28 EUS procedures and CT/MRI were performed. pNETs were identified in 95% of all 20 MEN1 cases. Overall median pNET size was 7.1 mm on EUS and 14.5 mm on CT/MRI ($P = 0.007$). Median value for smallest pNETs detected by EUS was 4.6 mm and 12.7 mm on CT/MRI ($P = 0.001$). EUS detected 89.3% more pancreatic lesions/pNETs compared to CT/MRI ($P < 0.001$). The interquartile range (IQR) for smallest pNET detected by EUS was 3.0 mm to 5.0 mm while IQR for CT/MRI lies between 8.3 mm to 14.8 mm. EUS detected all 100% cases of pNETs in our series of MEN1 compared to CT/MRI imaging alone which detected 57.9% cases ($P = 0.008$). Fourteen of 20 patients had FNA performed with a positive yield of 85.7%. In 50% of patients, pNET was small (≤10 mm). In MEN1 patients, CT/MRI underestimated the presence of many pNETs.

Discussion & Conclusion:
EUS detects more pNETs than CT/MRI as well as a greater number of pancreatic lesions, especially subcentimetre ones. EUS should be considered a standard tool in the algorithm for MEN1 workup.

CR-25

Role for Prolonged Wireless pH Study (Bravo) in Normal Multichannel Intraluminal Impedance-pH (MII-pH)

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Background & Hypothesis:
Wireless pH capsule (Bravo) can potentially increase the diagnostic yield of standard 24-hour catheter-based studies with prolonged monitoring. This study aimed to assess the additional diagnostic yield of extended Bravo recordings (up to 96 hours) in patients with normal 24hr MII-pH results.

Methods:
A total of 44 patients with GORD symptoms but normal MII-pH studies off proton pump inhibitor (PPI) were referred for Bravo studies which were performed beyond 48 hours (up to 96 hours). Cases with an abnormal acid exposure time (AET) were used as primary end-point. Subgroup analyses were subsequently made on cohorts whose MII-pH showed normal AET with: A) normal number of total reflux episodes, B) normal number of non-acid reflux (NAR) events, and C) increased number of NAR events. Statistical analysis was performed using SPSS v20.

Results:
Bravo studies were completed beyond 48 hours in 97.7% of patients. Bravo with AET cutoff >4.2% captured an additional 59.1% of cases with increased AET ($P <0.001$) compared to MII-pH. In MII-pH subgroups of A, B and C, Bravo was able to reveal an additional abnormal AET of 61.8% ($P <0.001$), 60.9% ($P <0.001$), and 50.0% ($P = 0.016$), respectively, compared to MII-pH. Results were similar using other internationally published Bravo AET limits of >4.4% and >5.3%. Inclusion of cases with positive symptom reflux association also showed additional diagnostic yield ranging from 42.9% to 47.7% ($P \leq 0.031$).

Discussion & Conclusion:
Extended Bravo studies managed to procure a diagnosis of GORD in more than half of the cases with an initial normal MII-pH but persistent symptoms. This has the potential to alter diagnosis in difficult cases and affect management by intensifying acid suppression therapy.

CR-26

Pseudoachalasia: Is Endoscopic Ultrasound (EUS) Still Relevant?

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Background & Hypothesis:
Pseudoachalasia is an infrequent secondary form of achalasia with a different management. Oesophago-gastro-duodenoscopy (OGD), high resolution manometry (HRM), barium esophagogram, CT scan and EUS play complementary roles in diagnosing achalasia and excluding pseudoachalasia. This study aims to evaluate the role of EUS in excluding pseudoachalasia for patients referred for achalasia workup.

Methods:
Data was collected retrospectively from hospital electronic records. Our study group comprised 77 patients. Only cases with a non-diagnostic OGD were included. Cases with mass seen on OGD were excluded. Workup included the following: A) classic achalasia symptoms, B) normal OGD, C) positive HRM for achalasia/gastro-oesophageal junction outflow obstruction (GOJ-OO), and D) had CT scan performed. Yield of excluding pseudoachalasia with addition of EUS was analysed in 4 groups: 1) A+B, 2) A+B+C, 3) A+B+D and 4) A+B+C+D. Statistical analysis was performed using SPSS V20.

Results:
Almost all patients (98.7%) had dysphagia as the main symptom. OGD was non-diagnostic in all cases. EUS was performed in all patients. Number of pseudoachalasia cases detected in Group 1 [n = 77], Group 2 [n = 53], Group 3 [n = 38] and Group 4 [n = 26] were 0, 0, 3 and 0 respectively. With addition of EUS, incremental detection of pseudoachalasia in these respective cohorts were 7.8% ($P = 0.031$), 1.9% ($P = $ NS), 0% ($P = $ NS) and 0% ($P = $ NS). EUS showed a sensitivity, specificity, PPV and NPV of 85.7%, 100%, 100% and 98.6%.

Discussion & Conclusion:
In excluding pseudoachalasia, addition of EUS to a well complemented workup (typical symptoms, OGD, HRM and/or CT scan) may not yield statistically significant benefit. However, EUS demonstrated good sensitivity and excellent specificity, PPV and NPV for pseudoachalasia especially in any diagnostic dilemma.

CR-27

Lack of Clinical Efficacy of Prophylactic Platelet Transfusion in Adult Dengue

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Background & Hypothesis:
Thrombocytopaenia is a common feature of adult dengue disease globally. Practices on prophylactic platelet transfusion vary across countries.

Methods:
We conducted a multicentre, open-label, randomised clinical trial of prophylactic platelet transfusion versus supportive care in adult dengue patients with platelet count ≤20 x 10^3/ul without major bleeding in 5 hospitals in Singapore and Malaysia. Dengue severity classification followed WHO 1997 and 2009 guidelines. Primary outcome was any clinical bleeding while secondary outcomes were severe bleeding, warning signs, dengue hemorrhagic fever (DHF), severe dengue, length of stay, intensive care admission and death.

Results:
From 2010 to 2014, 369 eligible patients participated in the study; 182 were randomised to supportive care and 187 to platelet transfusion. Baseline data including age, gender, comorbidities, clinical bleeding, warning signs, DHF and severe dengue were comparable between groups—48 (26.4%) in supportive group versus 40 (21.4%) in transfusion group has primary outcome (odds ratio [OR]: 1.32, 95% confidence interval [CI], 0.88-1.97, P = 0.158). Clinical bleeding except petechiae at study day 21 (OR: 3.02; 95% CI, 0.79-2.04; P = 0.336), severe bleeding (OR: 0.44; 95% CI, 0.13-1.47; P = 0.259), warning signs (OR: 3.02, 95% CI, 0.80-11.3; P = 0.140), severe dengue (OR: 0.74; 95% CI, 0.27-2.04; P = 0.616) and median length of stay (5 vs 4 days, P = 0.407) were similar between groups. Overall, 4 patients developed DHF (OR: 1.06; 95% CI, 0.15-7.65), 2 were admitted to intensive care (OR: 1.04; 95% CI, 0.06-16.7), and none died.

Discussion & Conclusion:
Prophylactic platelet transfusion was not effective in reducing bleeding in adult dengue patients with platelet count ≤20 x 10^3/ul. All patients on supportive care had spontaneous platelet recovery.

CR-28

Significant Effect of Migrant Status and Secondary Infection across Ethnic Groups on Platelet Nadir, Mucosal Bleeding and DHF Status, but Not Liver Inflammation or Gastrointestinal Symptoms in Confirmed Adult DENV-2 Infection

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Background & Hypothesis:
The clinical effect of secondary infection on clinical parameters and outcomes in dengue has often been clouded by multiple interacting risk factors.

Methods:
We studied a cohort with confirmed DENV-2 infection by PCR or viral isolation (sequencing-confirmed in 74%) comprising 311 Chinese and South Asian adults (18-67 years old) either resident in an endemic region or migrant workers. Daily clinical and laboratory investigations were performed from study enrolment when symptomatic until. Secondary infection was determined using daily IgG and IgM ELISA testing during acute illness.

Results:
The Chinese transient migrant workers who emigrated to Singapore had a significantly greater proportion of secondary cases (73%) than the local Chinese (53%) in Singapore. Of these migrant Chinese workers with secondary dengue, 97% were not aware of previous dengue infection, likely subclinical infection or less symptomatic than the current infection. South Asian migrant workers had similar proportions of secondary cases as resident Indians. There was a significant effect of migrant status on presence of mucosal bleeding (aOR = 2.2 [95% CI, 1.2-3.8]) among Chinese but not Indians, and of secondary dengue status on development of dengue hemorrhagic fever (aOR = 4.7 [95% CI, 1.6-13.5]) by multivariate logistic regression. By multivariate linear regression, secondary infection was modelled to decrease platelet nadir by 27,000 mm^3 (95% CI, 18000-35000).

Discussion & Conclusion:
The effect of secondary status on progression to DHF confirmed previous reports of this association in secondary DENV-2 infection. Symptom profile may depend on migrant status independent of ethnicity or secondary dengue status, possibly due to general health status or comorbid conditions.

CR-29

A Pilot Analysis of the Referral for Nasopharyngeal Carcinoma Screening in Tan Tock Seng Hospital

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Background & Hypothesis:
The Singapore Clinical Practice Guideline in 2010 recommended that only patients with a first-degree relative with NPC enter a screening programme. In practice, we perceive a large proportion of such referrals in patients with a family history of NPC. A pilot study was conducted to evaluate this hypothesis and the value of our screening practice.

Methods:
A retrospective data collection of patients who received an Epstein-Barr Virus (EBV) IgA serology screening in Tan Tock Seng Hospital (TTSH) from 2010 to 2015 was conducted using the laboratory's database. The pilot analysis of the first 102 patients is presented here.

Results:
Surprisingly, most patients who had EBV serology testing in TTSH have symptoms of NPC. Real screening cases comprise 38.3% of the cohort, of which only 25% have positive family history. Among patients with family history, 71.4% have a first-degree relative with NPC. There were 6 diagnosed cases of NPC among the 102 subjects, all were symptomatic and diagnosed within 20 days of referral. The average cost of care for all patients was $902.30, because of the utility of 4.16 nasal endoscopies, 0.419 MRI postnasal space, 0.392 biopsy and 2.86 EBV serology tests per patient.

Discussion & Conclusion:
This pilot data surprised us by showing NPC screening is not frequently practised. It is more often done for abnormal EBV serology than positive family history. The chance of diagnosing NPC is higher in symptomatic patients, and more data is required to support screening practice. The cost of NPC screening in those without NPC is not low.

CR-30

Frailty and Risk of Adverse Outcomes in Hospitalised Older Adults: A Comparison of Different Frailty Scales

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Background & Hypothesis:
There is paucity of data for frailty assessment in acutely ill hospitalised older adults. We aim to: 1) examine the reliability of frailty scales (FRAIL, Clinical Frailty Scale [CFS], and Tilburg Frailty Indicator [TFI]) in identifying frailty, using Frailty Index (FI) as a "gold standard", and 2) compare their ability to predict negative outcomes amongst hospitalised older adults.

Methods:
A total of 210 consecutive patients (mean age, 89.4 ± 4.6, 69.5% female) admitted to the Department of Geriatric Medicine were included. Premorbid frailty status was assessed via FI, FRAIL, CFS and TFI. We collected data on comorbidities, functional status, and Severity of Illness (SI). Area under receiver operator characteristic curves (AUC) for FRAIL, CFS and TFI were compared against the reference FI. Multiple logistic regression was performed to examine the association between frailty and the primary outcome of in-hospital mortality.

Results:
Frailty prevalence estimates were 87.1% (FI), 50% (FRAIL), 81% (CFS), and 80% (TFI). AUCs against FI ranged from 0.81 (95% CI, 0.72-0.90 [FRAIL]) to 0.91 (95% CI, 0.87-0.95 [CFS]), with no significant difference between scales. Frailty, as defined by FRAIL score >3, was associated with significantly higher in-hospital mortality (87% vs 12.5%, $P = 0.031$), duration of hospitalisation (10 days [6.0-17.5] vs 8 days [5.0-12.0], $P = 0.043$), and reduced likelihood of discharge to home (46.8% vs 53.2%, $P = 0.007$). Only FRAIL independently predicted inpatient mortality in multiple logistic regression adjusted for age, gender and SI (OR: 3.28; 95% CI, 1.42-7.80; $P = 0.006$).

Discussion & Conclusion:
FRAIL scale is a simple screening tool that may identify older adults at highest risk of adverse outcomes of hospitalisation.

CR-31

A Retrospective Review of the Clinical Effectiveness, Safety and Tolerability of Infliximab in Psoriasis Vulgaris Patients in Singapore

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Background & Hypothesis:
Infliximab is an antitumour necrosis alpha biologic agent licensed for treatment of moderate to severe psoriasis and psoriatic arthritis. Clinical improvement can be seen as early as 2 weeks. However, loss of efficacy due to neutralising antibodies remains challenging. Concurrent methotrexate has been shown to reduce their development. Common adverse effects include flu-like illnesses, transaminitis and infections. Our study aimed to evaluate the clinical effectiveness, safety and tolerability of infliximab in psoriasis patients in Singapore.

Methods:
We conducted a retrospective study of patients who had received infliximab for psoriasis vulgaris with or without psoriatic arthritis from 1 April 2012 to 31 May 2016. Cases were identified from the National Skin Centre's pharmacy database and inpatient admission records. Demographics, diagnosis, investigations pre-infliximab, treatment outcome and adverse reactions were recorded.

Results:
In total, 7 patients received infliximab for psoriasis of the erythrodermic, plaque type and generalised pustular subtype. Five out of 7 patients had additional psoriatic arthritis; 70% of patients achieved at least 50% improvement in their body surface area affected at week 14. Most had no short term complications; 2 patients had to stop Infliximab due to infections; 57% developed loss of efficacy after a mean of 5 cycles of infliximab due to secondary failure despite the concurrent use of methotrexate.

Discussion & Conclusion:
Infliximab dramatically improved moderate to severe psoriasis vulgaris. However, many patients developed loss of efficacy despite the combination with low dose methotrexate, and serious infections were also an issue.

CR-32

Opportunistic Education on Benefits of Vaccination at Community Events Can Increase Willingness for Influenza Vaccination

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Background & Hypothesis:
Influenza circulates year round, with bimodal peaks, in tropical Singapore. However, influenza vaccination uptake remains low.

Methods:
We conducted a quasi-experimental before-after study to assess for the effectiveness of an opportunistic educational programme, during a community event, in improving knowledge on the benefits of influenza vaccination and increasing willingness for vaccination.

Results:
A total of 124 adults were engaged, with a mean age of 69.4 (SD 8.8) years. Majority were females (83.9%) and of Chinese ethnicity (91.9%). Half (52.4%) reported that vaccination could protect them against disease; only 36 (29.0%) had ever received influenza vaccination. Following our educational intervention, a significantly higher proportion of seniors (66.1%) stated they would advise their friends to go for vaccination to prevent influenza (OR: 2.89; 95% CI, 1.31-7.01; McNemar's P = 0.0041). An even higher proportion (69.4%) reported their own willingness to receive vaccination (OR: 9.33; 95% CI, 4.03-26.51; McNemar's P <0.001). On multivariable analysis, after adjusting for gender and ethnicity, history of receiving influenza vaccination (OR: 5.41; 95% CI, 1.61 to 18.22; P = 0.006) and prior knowledge of vaccination's disease protection effect (OR: 8.71; 95% CI, 3.37-22.52; P <0.001) were positively associated with seniors advising friends to receive vaccination to prevent influenza. Prior knowledge of vaccination's disease protection effect (OR: 3.47; 95% CI, 1.48-8.15; P = 0.004), was also independently associated with seniors' expressed willingness to receive influenza vaccination posteducational intervention.

Discussion & Conclusion:
Opportunistic education at community events can increase knowledge and willingness for influenza vaccination. The benefits of vaccination in protecting against disease should be actively promoted.

CR-33

What are the Psychosocial Factors that Determine Hand Hygiene Compliance and the Perceived Need to Improve?

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Background & Hypothesis:
Hand hygiene compliance among healthcare staff is important yet suboptimal.

Methods:
We conducted a cross-sectional study, using a 36-item 5-point Likert-scale questionnaire, to assess for psychosocial factors associated with hospital staff's reported good hand hygiene compliance and their perceived need to improve on compliance during routine patient care.

Results:
Of 1064 staff, nurses (40.1%) were more likely than allied health professionals (AHPs) (31%) and doctors (22.8%) to report good hand hygiene compliance ($P <0.01$) and even more likely (67.1%) to perceive the need to improve on their hand hygiene compliance (AHPs 18.8%, doctors 14.1%) ($P <0.0001$). Seven psychosocial factors were identified on principal components analysis (Cronbach's alpha 0.33-0.86). After adjusting for gender, staff category, years in profession, seniority, and history of dermatitis, having positive knowledge-attitudes-behaviours toward hand hygiene (OR: 1.44; 95% CI, 1.22-1.68), having personal motivators and enablers (OR: 1.61; 95% CI, 1.39-1.86) and emotional motivators (OR: 1.62; 95% CI, 1.40-1.88) were positively associated with good hand hygiene compliance. In comparison, senior staff (OR: 3.33; 95% CI, 1.26-8.80), nursing staff (OR: 2.94; 95% CI, 1.12-7.74), staff who had personal motivators and enablers for hand hygiene (OR: 1.52; 95% CI, 1.03-2.26) and who needed external reminders (OR: 1.59, 95% CI, 1.11-2.28) were more likely to perceive the need to improve on their own hand hygiene compliance.

Discussion & Conclusion:
Healthcare staff who had personal motivators and enablers were more likely to report good hand hygiene compliance and also to perceive the need to improve on their compliance. They could serve as hand hygiene role models.

CR-34

Middle East Respiratory Syndrome (MERS) and Influenza Surveillance for Returned Travellers from MERS-Affected Areas

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Background & Hypothesis:
Since the emergence of the Middle East respiratory syndrome (MERS) coronavirus (CoV) in 2012, an active surveillance programme for travellers returning from MERS-affected areas has been implemented in our hospital.

Methods:
We conducted an analytic cross-sectional study of suspected MERS patients admitted to our hospital from 25 September 2012 through 10 February 2016, to compare the clinical epidemiology in Singapore residents with non-residents. We compared differences in epidemiological and clinical characteristics, using t-test for continuous variables and chi-square test for categorical variables. We then constructed multivariable logistic regression models to assess for independent factors associated with influenza infection in the returned travellers.

Results:
MERS Co-V was not detected in the 262 patients investigated. Half were male and almost two-thirds (65.3%) were Singapore residents. Residents (mean 54.1 [SD 14.9] years) and non-residents (mean 56.8 [SD 16.1]) were similar in age ($P = 0.171$). Majority (60.7%) had returned from the Kingdom of Saudi Arabia, with significantly more Singapore residents (69.6%) than non-residents (44.0%) returning from the Kingdom ($P < 0.001$). Cough (91.6%) and fever (90.5%) were the most common presenting symptoms. A significantly higher proportion of non-residents (45.1%) than residents (22.2%) were being infected with influenza ($P < 0.001$). After adjusting for age, travel destination, and admission month, non-residents were thrice as likely as residents to have an influenza infection (OR: 2.96; 95% CI, 1.61-5.44; $P < 0.001$).

Discussion & Conclusion:
Influenza was common among returned travellers from MERS-affected areas, especially in non-residents. Influenza vaccination and good personal hygiene should be actively promoted to all travellers to MERS-affected areas.

CR-35

Dengue Disease Burden during Outbreak and Non-Outbreak Periods

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Background & Hypothesis:
Dengue fever is endemic in Singapore, with epidemics occurring every 2 to 6 years. We compare the disease burden during outbreak and non-outbreak periods to assess for surge capacity required.

Methods:
We conducted an analytic cross-sectional study on dengue fever patients who attended our hospital from 3 January 2010 (epidemiological week 1, 2010) through 20 February 2016 (epi-week 7, 2016). We compared the number of laboratory-confirmed dengue infections over the years and between outbreak and non-outbreak weeks, and estimated the odds ratios and 95% confidence intervals for the associations.

Results:
A total of 11,417 patients had laboratory-confirmed dengue infection. The mean weekly dengue infection rate was 28.4% (SD 11.6%). We defined an outbreak week as a week with infection rate exceeding 51.6% (mean+2SD). Outbreaks had occurred in the middle of the year in 2011, in the second half of 2012, and at the beginning of 2013. After adjusting for the time of the year, dengue infections have increased by an average of 37 per week in years 2013 to 2016 compared to earlier years 2010 to 2012 (OR: 36.74; 95% CI, 32.17-41.31; P <0.001). There were also an average of 28 more infections during outbreak weeks compared to non-outbreak weeks (OR: 28.36; 95% CI, 14.90-41.81; P <0.001).

Discussion & Conclusion:
Dengue fever remains a public health threat in Singapore, and the number of infections managed at our hospital has increased significantly in the past 3 years. Preparations would have to be made to ensure the availability of additional resources to cope with the surge in dengue infections during outbreak periods.

CR-36

Systemic Manifestations At-Admission of Adult Influenza Infections Differed with Age

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Background & Hypothesis:
Influenza infections are under-recognised in the tropics, although influenza viruses circulate year-round. Clinical manifestations can vary across ages. We sought to assess for differences in the clinical presentation of influenza infections in hospitalised older and younger adults in tropical Singapore.

Methods:
From January 2010 to May 2015, we evaluated the epidemiology of influenza in a 1600-bed adult tertiary-care hospital, and conducted a case-control study to assess for epidemiological and clinical factors associated with influenza infection, in adults aged >65 and ≤65 years respectively. We constructed multivariable logistic regression models to assess for independent factors associated with influenza infection in the 2 age groups.

Results:
A total of 5646 (12.2%) out of 46,218 admissions was confirmed with acute influenza via polymerase chain reaction (PCR) test. After accounting for age, factors associated with influenza infection were: female gender (OR: 1.21; 95% CI, 1.14-1.28), mild or no comorbidities (OR: 2.11; 95% CI, 1.72-2.57), admission during peak influenza months (OR: 1.93; 95% CI, 1.83-2.05), and at-admission presentation of systemic manifestations (OR: 1.51; 95% CI, 1.35-1.70). Association between systemic manifestations and influenza infection differed with age. Adults ≤65 presenting with systemic manifestations were 50% more likely to have influenza (OR: 1.51; 95% CI, 1.34-1.70), but not older adults >65 (OR: 1.07; 95% CI, 0.96-1.12).

Discussion & Conclusion:
Influenza hospitalisation is more common in females. Younger adults (≤65 years) with influenza infection may present with systemic manifestations at-admission.

CR-37

Admitting Diagnosis for Influenza Infection Differ during Peak and Non-Peak Influenza Months

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Background & Hypothesis:
In tropical Singapore, influenza viruses circulate all year-round, with bimodal peaks in the middle and at the end of the year. Early recognition of influenza infections can facilitate timely clinical management. Our study's objective was to assess for admitting diagnoses associated with influenza infection during peak and non-peak influenza months.

Methods:
We conducted a case control study at a 1600-bed adult tertiary-care hospital in Singapore, from January 2010 to May 2015. Cases were inpatients with positive influenza polymerase chain reaction (PCR) tests and controls were inpatients with negative results. Epidemiological and clinical data were obtained from electronic medical records. We constructed multivariable logistic regression models to assess for independent admitting diagnoses associated with influenza infection during peak and non-peak influenza months respectively.

Results:
Of 46,218 admissions, 5646 (12.2%) were confirmed with acute influenza. Influenza positivity was 16.1% during peak influenza months, compared to 9.0% during other months (P <0.0001). Majority of admitting diagnoses were respiratory infections (21.3%), airway diseases (19.6%), non-respiratory infections (17.8%), and systemic manifestations (13.1%). During peak influenza months, an admitting diagnosis of airway disease (OR: 0.72; 95% CI, 0.63-0.83) was less likely to be associated with influenza infection, after adjusting for age, gender, comorbidities, and past influenza vaccination. During non-peak influenza months, systemic manifestations (OR: 1.29; 95% CI, 1.10-1.50) were additionally associated with influenza infection.

Discussion & Conclusion:
In the tropics, influenza infections requiring hospitalisation tend not to present with airway diseases. During non-peak influenza months, influenza infection should be considered in patients presenting with non-specific systemic manifestations.

CR-38

Atypical Presentation for Influenza Infection Associated with In-Hospital Mortality Risk

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Background & Hypothesis:
Influenza viruses circulate year-round in tropical Singapore. Influenza infection can result in excess morbidity and mortality. However, the risk factors for influenza-related mortality are not well studied in the tropics. We assessed for patient factors associated with in-hospital mortality related to acute influenza infection in Singapore.

Methods:
We followed up a cohort of adult patients hospitalised with acute influenza in a 1600-bed adult tertiary-care hospital, between January 2010 and May 2015. We compared the clinical characteristics of patients who died in-hospital with those discharged well. Multivariable logistic regression models were constructed to assess for independent predictors of in-patient mortality.

Results:
A total of 5646 patients were hospitalised with acute influenza confirmed by polymerase chain reaction (PCR). Among them, 214 (3.8%) died during admission, with 78% aged >65 years. After adjusting for gender and duration of hospital stay, age >65 years (OR: 2.37; 95% CI, 1.68-3.35), Charlson's comorbidity index >5 (OR: 2.68; 95% CI, 1.36-5.27), intensive care unit admission (OR: 7.06; 95% CI, 4.44-11.22), presenting diagnosis of respiratory infection (OR: 2.01; 95% CI, 1.21-3.33), respiratory disease except airway diseases (OR: 2.01; 95% CI, 1.09-3.69), non-respiratory infection (OR: 1.75; 95% CI, 1.04-2.94), or cardiovascular disease (OR: 2.27; 95% CI, 1.13-4.57), were independently associated with in-hospital mortality.

Discussion & Conclusion:
Among influenza infections, older (>65 years) patients, patients with severe comorbidities (Charlson's comorbidity index >5), as well as patients who present atypically with non-respiratory infections and cardiovascular diseases, have higher in-hospital mortality risks. These high risk patients should be actively identified and carefully managed during hospital admission.

CR-39

Molecular Epidemiologic and Risk Factor Differences of Vancomycin-resistant *Enterococcus* Colonisation between Healthcare Facilities

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Background & Hypothesis:
Vancomycin-resistant *enterococcus* (VRE) infections are increasing, but little is known about VRE in intermediate- and long-term care facilities (ILTC). We compared the molecular epidemiology and risk factors of VRE colonisation among patients of an acute hospital (AH) and its affiliated ILTC.

Methods:
We conducted a cross-sectional study from 2 June to 9 July 2014. Rectal swabs or stool were cultured for VRE and isolates genotyped via PCR. Epidemiologic data were obtained from medical records, and associations with VRE colonisation made. To control for confounding, multivariable logistic regression models were constructed.

Results:
A total of 1675 patients were screened. VRE prevalence was 7.8 times higher in AH than ILTC (OR: 8.83; 95% CI, 5.45-14.30; P <0.001). *Van B* genotype was detected in patients from AH, but not ILTC. In ILTC, having a length of stay (LOS) of >14 days was negatively associated with VRE colonisation (OR 0.27; 95% CI, 0.11-0.69; P = 0.007), after adjusting for age, gender, and presence of percutaneous endoscopic gastrostomy tube (PEG). In AH, LOS >14 days (OR: 1.96; 95% CI, 1.40-2.74; P <0.001), prior hospitalisation (OR: 1.67; 95% CI, 1.20-2.33; P = 0.002), known VRE status (OR: 3.09; 95% CI, 1.40-6.83; P = 0.005), and presence of PEG (OR: 1.72; 95% CI, 1.13-2.63; P = 0.011) were positively associated with VRE colonisation, after adjusting for age and gender.

Discussion & Conclusion:
The molecular epidemiology and risk factors for VRE differed across healthcare facilities. *Van B* was detected in patients from AH but not ILTC. Length of stay >14 days was positively associated with VRE colonisation in AH, but negatively associated in ILTC.

CR-40

Improving the Accuracy of Quality of Life Assessments in Myopia

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Background & Hypothesis:
Myopia is a common cause of visual impairment in Singapore and Asia, and has significant impact on the quality of life (QOL). Standard QOL questionnaires, however, report relatively high QOL among myopes which, we hypothesise, does not accurately reflect the true impact of myopia on QOL. This study aimed to assess QOL in myopes using modified QOL questionnaires, and to compare the results with standard questionnaires.

Methods:
In a prospective study, standard and modified Visual Function-14 (VF-14) and utility values questionnaires (time trade-off [TTO] and standard gambles for death and blindness [SGD & SGB]) were administered to 176 myopes. Using the modified questionnaires, participants were asked to imagine life without corrective lenses and answer the questions in the context of this scenario.

Results:
Using standard questionnaires, there was no significant difference in QOL scores between participants with severe and low myopia. However, using modified questionnaires, severe myopes scored significantly lower than low myopes (VF-14: 22.5 vs 58.9; TTO: 0.73 vs 0.82; SGB: 0.88 vs 0.95; SGD: 0.92 vs 0.96, all P <0.05). Compared to the standard questionnaires, scores using the modified VF-14, TTO, SGB and SGD were significantly lower (VF-14: 48.7 vs 99.0, TTO: 0.80 vs 0.95, SGB: 0.93 vs 0.99, SGD: 0.95 vs 0.99, all P ≤0.002).

Discussion & Conclusion:
Myopes respond differently to modified QOL assessments compared to standard questionnaires, and reported lower QOL which correlated with the severity of myopia. The modified QOL questionnaires may offer a more accurate reflection of the true extent of impairment of QOL as a result of myopia.

CR-41

Is it Worth the Effort? Creation of Arterio-Venous Fistulas in Octogenarians

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Background & Hypothesis:
We aimed to evaluate the outcomes of arterio-venous fistula (AVF) creation in patients ≥80 years old.

Methods:
This was a retrospective study of 47 AVFs in patients aged ≥80 from November 2008 to December 2014. Factors investigated include patient demographics, comorbidities, previous central venous interventions, end-stage renal failure (ESRF) status, current medications, preoperative ultrasound vein map, surgeon grade and requirement for assisted patency interventions (tributary ligation, fistuloplasty or AVF revision).

Results:
Average age was 82.8 years old (range 80-91). Within the study population, 27 (57.4%) were male, 30 (63.8%) were ADLs (activities of daily living)-independent and 35 (74.5%) had permanent catheters (PC) in-situ, with haemodialysis commenced prior to AVF creation. The average vein and artery diameters were 2.4 mm and 3.5 mm respectively. There were a total of 15 (31.9%) radio-cephalic, 30 (63.8%) brachio-cephalic and 2 (4.3%) brachio-basilic AVFs created. Primary AVF patency rate was 14.9% (7) whilst primary failure rate was 72.3% (34). There were no postop wound infections. PC-line sepsis rate was 31.4% (11). A further 12.8% (6) underwent additional intervention and achieved assisted primary and secondary patency. Univariate analysis did not reveal any factor to be statistically significant in predicting AVF patency. Kaplan-Meier survival curve showed a 50% survival rate at 63 months.

Discussion & Conclusion:
In view of high AVF primary failure rate (72.3%) and relatively low PC-line sepsis rate (31.4%), long term PC as the main form of haemodialysis renal access may be a viable option in octogenarians. However, with 50% of ESRF patients surviving up to 63 months after AVF creation, the risks and benefits of long term PC must be balanced against those of AVF creation.

CR-42

Sleep Architecture in Nurses

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Background & Hypothesis:
The normal adult sleep cycle consists of 3-5 cycles of alternating non-rapid eye movement (NREM) and rapid eye movement (REM) sleep. Sleep architecture describes the transitions of sleep stages. The distribution of sleep stages in a normal young adult is as follows: Stage Wake (<5%), Stage 1 (2%-5%), Stage 2 (45%-55%), Stage 3 (3%-8%), Stage 4 (10%-15%), Stage REM (20%-25%). Despite multiple population-based studies supporting these data, there is a paucity of information on sleep architecture in shift workers, especially nurses, who are subjected to regular sleep deprivation and disturbances in circadian rhythm.

Methods:
This was an observational study with convenience sampling of 12 healthy nurses from an academic medical centre in Singapore as part of a study correlating the accuracy of wearable sleep monitors with polysomnographic (PSG) data. Subjects underwent full night Type 1 standard attended in-lab PSG. Conventional PSG parameters, as recommended in the American Association of Sleep Medicine (AASM) scoring manual, were collected.

Results:
Relative paucity of SWS in nurses was observed. Slow wave sleep (SWS) was absent in 50% of the subjects. Average sleep efficiency, percentage of REM sleep, Stage N1, Stage N2 and Stage N3 are 88.1%, 22.3%, 7.6%, 65.3% and 4.9% respectively. The average total sleep time was 5.9 hours.

Discussion & Conclusion:
A significant loss of SWS was noted in our sample of shift work nurses. More studies are needed to verify this and its consequences on both the healthcare provider and patients.

CR-43

The 4 Views of the Fluoroscopic-guided Transbronchial Lung Biopsy

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Background & Hypothesis:
Transbronchial lung biopsy (TBLB) was first introduced by Howard Anderson in 1965 when the procedure was performed in 13 patients. It still remained widely employed as the diagnostic method of choice in diagnosis of peripheral lung diseases.

Methods:
Despite its widespread use, there is a paucity of literature correlating the 4 basic views of fluoroscopic guided TBLB i.e radiologic (coronal and sagittal CT cuts), fluroscopic and bronchoscopic views. We compiled a collection of these views for each of the commonly accessed bronchopulmonary segments for a series of known peripheral lung diseases.

Results:
Diagnostic accuracy can be as high as 60% in skilled hands in well selected patients. Newer technologies such as electromagnetic navigation, navigation bronchoscopy, and radial endobronchial ultrasound have challenged the use of fluoroscopic-guided TBLB. However, the current cost-benefit ratio does not justify the routine use of these novel techniques. Though the diagnostic yield from a combination of the novel techniques may be as high as 88%, this is unlikely in centres with low volume and in inexperienced hands.

Discussion & Conclusion:
Advantages of TBLB over such newer techniques include higher cost-effectiveness, shorter endoscopy time and a less steep learning curve. Advantages of newer methods include less or no radiation exposure and higher diagnostic yield with the more precise imaging techniques.

CR-44

The Profile of Non-Tuberculous Mycobacteria (NTM) and Clinical Characteristics of Patients in Singapore

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Background & Hypothesis:
The incidence of NTM infections has been increasing worldwide with significant morbidity and mortality. Host factors such as genetic susceptibility, immune deficiency, lung diseases and environmental factors influence the development of NTM infection, treatment outcome and prognosis. We aimed to study the NTM profile, its clinical relevance and the characteristics of patients.

Methods:
All hospitalised patients in whom NTM was isolated between January 2011 and December 2012 were studied. We analysed their demographics, smoking status, NTM species, source of specimens, and comorbidities.

Results:
A total of 560 patients (62% male) with NTM isolation were identified. The median (IQR) age was 78 (55-74) years; 20% were current smokers. Majority (91%) of the NTM isolations was of pulmonary origin. *M. abscessus* (38.1%) was the commonest, followed by *M. fortuitum* (16.6%), *M. avium* (16.5%), *M. kansasii* (15.4%), *M. gordonae* (7%), *M. chelone* (1.6), *M. lentiflavum* (1.5%), *M. scrofulaceum* (1.1%), *M. haemophilum* (0.8%), *M. simiae* (0.6%), *M. szulgai* (0.6%), and *M. terrae* (0.4%). Underlying lung diseases were common (29.3% bronchiectasis, 15% COPD, 8.6% asthma, 3.6% pulmonary fibrosis). Other common comorbidities were hypertension (31.3%), hyperlipidaemia (25.7%) and diabetes mellitus (17%); 11.8% of the patients had HIV infection and 5.7% had active cancer.

Discussion & Conclusion:
This study showed NTM infections to be common in elderly male patients. *M. abscessus* was the commonest among the 12 species identified in this cohort. More than half of patients had underlying lung condition. There is an urgent need to study the epidemiological trend, its speciation, and the treatment of NTM infections.

CR-45

3D Printing in Preoperative Planning of Pelvic Fractures

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Background & Hypothesis:
Complex fractures such as pelvic fractures require a great deal of planning preoperatively in order to maximise the success of surgery, as adequate reduction and stable fixation are vital. Current methods of preoperative planning include the use of CT-3D reconstruction models and virtual environments e.g. TraumaCAD (BrainLab). Our study explores the use of 3D printed fracture models in preoperative planning.

Methods:
CT scan data of a pelvic fracture was processed using Materialise Interactive Medical Image Control System (MIMICS) software and printed using 2 different printers and materials: Fabbox 3D Printer (Fused Deposition Modelling – ABS plastic) and Objet30 Scholar Professional 3D Printer (Polyjet 3D printing technology – UV curable resin).

Results:
The fragments of the fracture were printed out separately and then stabilised temporarily with modelling clay. The model was durable enough to withstand instrumentation with power tools and fixation with screws and Synthes 3.5 mm Pelvic Recon stainless steel plates. The model was also useful to allow precontouring of the implant which would otherwise need to be done intraoperatively. This potentially reduces surgical time, blood loss and morbidity.

Discussion & Conclusion:
The 3D printed fracture model serves as a useful adjunct in understanding the fracture configuration and preoperative planning. Having the actual model to work with simplifies the selection and placement of implants as well as estimation of screw lengths and trajectory. It also enables preoperative contouring of implants.

CR-46

What is the Outcome of Anterior Cruciate Ligament (ACL) Reconstruction in Older Patients?

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Background & Hypothesis:
Our study aims to review the outcome of patients with anterior cruciate Ligament (ACL) reconstruction between different age cohorts. Recent literature has shown good outcomes of ACL reconstruction even in older patients.

Methods:
A total of 72 patients with an ACL reconstruction with a minimum of 1-year follow-up were identified and divided into 3 cohorts: A (ages 0 to 20), B (20 to 29) and C (30 to 39). Knee Injury and Osteoarthritis Outcome Score (KOOS) and International Knee Documentation Committee (IKDC) scores were conducted preoperatively and at 3 months, 6 months and 1 year.

Results:
Group C IKDC and KOOS scores were generally lower than groups A and B at the various follow-up intervals. There was no significant difference in scores between groups B and C. Group A had significantly better IKDC scores than groups B and C at the 6-month mark and better than Group B at the 1-year mark. For the KOOS score, Group A had better scores than Group B in the preoperative Activities of Daily Living (ADL), 3-month Sports and ADL, 6-month ADL and 1-year Sports subscale. Group A had better scores than Group C at the 3-month Symptoms and 6-month Sports and ADL subscale.

Discussion & Conclusion:
There is good progression in outcome in our cohort of patients but younger patients appear to have better outcome at mid-term follow-up. Further analysis on muscular strength, pre-existing degeneration and rehabilitation programme compliance would help identify possible factors for these differences.

CR-47

Clinico-Epidemiological Profile of Childhood Vitiligo in Singapore

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Background & Hypothesis:
Childhood vitiligo has distinct clinical features from adult vitiligo. We aimed to characterise the clinico-epidemiological profile of childhood vitiligo.

Methods:
A retrospective review of medical records was performed for children less than or equal to 16 years old, who were diagnosed with vitiligo at the National Skin Centre from January 2011 to December 2015. Children without clinical photographs were excluded.

Results:
There were 369 patients, with 176 males (48%) and 193 females (52%). The mean age at onset was 8.9 years. The most common subtype of vitiligo was non-segmental (n = 181, 49%), followed by segmental (n = 129, 35%). Twenty patients had koebnerisation (5%) and 52 patients had poliosis (14%). Positive family history of vitiligo or autoimmunity was present in 22 (6%) and 18 (5%) patients respectively. Nine patients had concomitant autoimmune disease (2%). Only 163 patients (44%) had pre- and post-treatment photographs. In this group, the mean follow-up duration was 33.6 months. Most were treated with topical corticosteroids or calcineurin inhibitors alone (n = 79, 49%). Others were treated with targeted phototherapy (n = 42, 26%), narrow-band ultraviolet B phototherapy (n = 13, 8%), surgical grafting (n = 2, 1%) or a combination of the above (n = 26, 7%). The type of treatment and age at onset (pre- versus post-pubertal onset vitiligo with a cutoff of 12 years) did not have significant associations with the outcome of greater than 50% repigmentation (P = 0.651 and 0.568 respectively).

Discussion & Conclusion:
The profile of childhood vitiligo in our population is largely similar to that in other countries, with a female predominance and higher prevalence of non-segmental vitiligo.

CR-48

Do Trauma Surgeons Make a Difference to Functional Outcomes for Elderly Hip Fracture Patients?

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Background & Hypothesis:
Current data in our local setting on outcomes of hip fracture surgery depending on the subspeciality of the team managing the patient is lacking. The aim of our study was to see if trauma surgeons' teams produced better functional outcomes for patients undergoing hip fracture surgery.

Methods:
This is a retrospective cohort study performed at a major tertiary hospital and trauma centre. A total of 427 geriatric hip fracture patients surgically treated over 1 year, from October 2011 to September 2012, were included in the study.

Results:
Both trauma and non-trauma teams had similar functional outcomes as determined by Modified Barthel Index (MBI) scores postoperatively. At 6 months, trauma teams' patients' mean MBI was reduced by 11.7 points compared to 11.6 for non-trauma teams ($P = 0.591$). At 1 year, trauma teams' patients' mean MBI was reduced by 7.4 points compared to 7.5 for non-trauma teams ($P = 0.841$). However, time to surgery was shorter for trauma teams (63.2 hours) compared to non-trauma teams (83.1 hours) ($P = 0.034$) and trauma teams sent 39.2% of patients for surgery in under 48 hours, whereas non-trauma teams achieved only 26.6% ($P = 0.007$). There was no difference in the length of stay ($P = 0.278$), complications ($P = 0.334$), and 1-year mortality ($P = 0.139$) between the 2 teams.

Discussion & Conclusion:
To our knowledge, this study is unique in determining if trauma teams make a difference to functional outcomes of operatively treated geriatric hip fracture patients. There was no difference in the functional outcomes at 6 months and 1 year postoperatively between patients managed by trauma teams or otherwise.

CR-49

SF-36 Mental Component Summary (MCS) Score Does Not Predict Functional Outcome after Hallux Valgus Surgery

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Background & Hypothesis:
Mental health status has been shown to influence functional outcomes in several orthopaedic procedures. This prospective cohort study assesses whether a diminished baseline Mental Component Summary (MCS) score on the Short Form (SF-36) is predictive of the functional outcomes after scarf osteotomy for hallux valgus deformity.

Methods:
Pre- and postoperative patient-reported scores of the SF-36 MCS (measured using both Oblique and Orthogonal methods), American Orthopaedic Foot and Ankle Society (AOFAS) Forefoot Score, and the Visual Analog Scale (VAS), were recorded. Postoperative improvements in Hallux Valgus Angle (HVA) and Inter-Metatarsal Angle (IMA) were measured. The Pearson-correlation test and the Wilcoxon-Signed-rank test were used to compare the pre- and postoperative scores.

Results:
A total of 65 feet were followed up with a mean of 18.4 months. A mean improvement of 24.5° in HVA and 7.92° in IMA were recorded. There was close correlation between the pre- and postoperative scores (MCS, PCS, AOFAS and VAS) (r >0.3). The Oblique MCS increased from 52.5 to 55.9 ($P = 0.0001$) and the Orthogonal MCS from 53.1 to 55.3 ($P = 0.004$). There was no correlation between the preoperative MCS scores and improvements in AOFAS scores or in the HVA or IMA at a minimum follow-up of 1 year (r <0.1).

Discussion & Conclusion:
Preoperative mental health status (MCS score) did not predict functional outcome (AOFAS score) at early follow-up after hallux valgus surgery. Improvements in HVA and IMA did not correlate with the preoperative MCS score nor improvements in the AOFAS score.

CR-50

The Collaborative Ocular Tuberculosis Study (COTS), an International Study of the Clinical Evaluation and Management of Ocular Tuberculosis at 25 Centres: Report 1 on Clinical Assessment and Management Outcomes

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Background & Hypothesis:
Progress in the elimination of tuberculosis (TB) has been mitigated by neglected populations and practice discrepancies, prompting realignment of global priorities for TB to active case-finding in vulnerable populations and initiation of appropriate therapy. Yet the diagnosis and management of ocular TB remain controversial due to lack of comprehensive data.

Methods:
This is a retrospective study of clinical assessment and management of all patients with ocular TB from 25 centres between January 2004 and December 2014. Patients with a minimum follow-up of 1 year are included.

Results:
A total of 962 patients are diagnosed with ocular TB, with a mean age of 41.3 (range 4-90) and a predominance of males (52.6%) of Asian ethnicity (74.4%) and geographical origin (60.4%). Most patients presented with bilateral ocular involvement (56.1%) and no symptoms of systemic TB (92.0%), with blindness in 136 patients (15.9%). Corroborative investigations were positive in 189 chest x-rays (26.9%), 109 (68.6%) computed tomography of the thorax, 549 (87%) Mantoux tests, and 336 (90.8%) interferon gamma release assays (IGRAs). A total of 801 patients (84.6%) received antitubercular therapy (ATT), 799 (85.0) received steroids, and 72 (9.0%) received steroid-sparing immunosuppressives. Use of steroid sparing immunosuppressives ($X^2 = 22.021$, $P <0.001$) were associated with poorer outcomes, and use of ATT was not associated with improved outcomes ($X^2 = 0.182$, $P = 0.669$) on survival analysis.

Discussion & Conclusion:
This is the largest data set on ocular TB to date, and highlights possible overdiagnosis and need for further prospective study of treatment in ocular TB.

CR-51

A Comparison of Ocular Syphilis Phenotypes between HIV-infected and Non-HIV Adult Patients

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Background & Hypothesis:
The incidence of new infection with syphilis is increasing worldwide over the last 2 decades and notably more common among individuals co-infected with human immunodeficiency virus (HIV). Our aim was to compare the clinical manifestations and characteristics of ocular syphilis among the HIV-positive and HIV-negative patients.

Methods:
A retrospective study was done on patients diagnosed with ocular syphilis at a tertiary referral eye care centre in Singapore between January 2005 and October 2015. Demographic characteristics, clinical presentations, investigation results and their visual outcomes were recorded.

Results:
A total of 32 eyes of 21 (16 eyes in 11 HIV-positive and 16 eyes in 10 HIV-negative) patients were included. All patients were male, with median age of 50 years old at presentation. A total of 7 eyes had panuveitis (all in HIV-positive patients), making panuveitis the commonest feature in this group. Acute anterior uveitis was the commonest presentation in the non-HIV group. Neurosyphilis was more common in the HIV-positive group (7/9 patients) with detection of syphilitic involvement in the cerebral spinal fluid. The outcome of ocular syphilis post-treatment was generally good with most (71.9% eyes) having good visual acuity of 6/12 or better in the affected eye. A similar distribution of good outcomes in visual acuity was seen in both groups (12 eyes in HIV positive, 11 eyes in HIV negative).

Discussion & Conclusion:
The higher rate of neurosyphilis warrants a routine lumbar puncture in all HIV-positive patients presenting with ocular syphilis. Prompt diagnosis and treatment of ocular syphilis can result in good outcomes even in HIV co-infected patients.

CR-52

Functional Outcomes after Surgical treatment of Tibial Plateau Fractures

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Background & Hypothesis:
Tibial plateau fractures are common fractures which constitute approximately 1% of all fractures. These fractures have a significant impact on long-term functional outcome because of its intra-articular nature. The primary aim of this study was to determine the functional outcome after operative management of tibial plateau fractures.

Methods:
This is a retrospective study conducted at a single tertiary-level institution. Forty-one patients with tibial plateau fractures were operatively treated during our study period. Patient information including injury mechanism, surgical treatment and associated injuries were documented. Preoperative and postoperative radiographs were reviewed to confirm Schatzker type and adequacy of reduction. Follow-up data for 31 patients was obtained 19 to 42 months postsurgery. All patients were administered functional outcome questionnaires using the Western Ontario and McMaster University Osteoarthritis Index (WOMAC) and Short Form 36 (SF-36) General Health Survey. Data regarding return to work and sports was also collected.

Results:
The average WOMAC score for patients with Schatzker I to III was 6.3 out of a maximum score of 96, significantly lower than the Schatzker IV to VI group, whose average score was 18.4 ($P = 0.0012$). The SF-36 score for the Schatzker I to III group was also significantly higher than the VI to VI group ($P = 0.0031$); 71% of patients reported partial to full return to work, while 65% of patients did not return to sports after injury.

Discussion & Conclusion:
The functional outcome of operatively treated tibial plateau fractures is satisfactory. Poor functional outcome is associated with higher energy fractures (Schatzker IV to VI) and polytrauma.

CR-53

New TnI Upper Reference Limit: Effect on Positivity Rates

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Background & Hypothesis:
There are a variety of different decision points used for interpretation of Troponin I (TnI) concentration. TSH has traditionally used a WHO AMI-based value of 0.5 ug/L (enhanced AccuTnI). Changes in methodology (AccuTnI+3) necessitate a recalibration and change to the more widely used 99% population centile of 0.04 ug/L to define the upper reference limit. This study assesses the effect of this new cutoff on positivity rates.

Methods:
Details of TnI requests for 2015 were extracted from the laboratory information system. Existing TnI results were transformed to new expected values using the equation NewTnI = (0.7166*Old TnI) – 0.0181 from an in-house evaluation study. Positivity rates using the old and new cutoffs for various TTSH sites were calculated.

Results:
In 2015, 65,087 TnI measurements were performed by TTSH Laboratory on the Beckman Coulter DxI immunoassay analyser using manufacturer supplied reagents. Using the existing cutoff of 0.5 ug/L, 10.4% were positive. This would rise to 27.9% with the new assay and a cutoff of 0.04 ug/L. The old and new positivity rates for various locations were: ED 3%, 11.5%; ICU 44%, 72.6%; Inpatients 11.9%; 34.1%. By department, the rates were: Gen Med 12.2%, 34.1%; Geriatrics 14.9%, 43.1%; Cardiology 38.2%, 56.4%; Gen Surgery 11.4%, 34.6%; Resp Med 7.8%, 29.4%; Neurology 10.6%, 26.9%; Renal 12.5%, 45.8%; Ortho 10.0%, 30.8%.

Discussion & Conclusion:
Use of this new assay and cutoff will markedly increase the positivity rate for TnI measurements. The clinical and health resource implications of such a change should be considered prior to implementation.

CR-54

Evaluation of the Staff Sickness Surveillance System in an Acute Care General Hospital in Singapore

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Background & Hypothesis:
Staff sickness surveillance systems may be used for early detection of nosocomial outbreaks. Our hospital uses real-time disease surveillance systems (based on daily online reporting of staff medical leave details) with alerts from the Infection Control Unit for early detection of staff infectious disease clusters. We evaluate our current system's performance in detecting acute respiratory infection (ARI) clusters.

Methods:
All staff sicknesses due to ARIs and ARI clusters from January 2014 to December 2015 were reviewed, and current thresholds for ARI cluster detection evaluated. To assess data completeness, we compared our data with official records submitted to the hospital's human resource (HR) department.

Results:
The overall completeness of the surveillance data was 77%. Over the study period, 20% of ARI medical records were submitted 1-2 weeks after disease occurrence. Hence, only 62% of ARI medical records were available for real-time surveillance. Using our current cluster detection thresholds of ≥3 ARI cases for small wards and ≥6 cases for large wards, 128 ARI clusters had occurred between January 2014 and December 2015. Of these, 32 were clusters that progressed and required interventions to reduce further transmission. Our system detected 14 such clusters, giving a sensitivity of 43.8% and a specificity of 79.2%. The positive predictive value was 41.2%.

Discussion & Conclusion:
Our surveillance system is useful for identifying staff ARI clusters for early intervention. Further enhancements to improve cluster detection include integrating the system with the hospital's HR database, providing mobile app platforms to facilitate reporting, and regularly reminding staff about timely and accurate reporting.

CR-55

Findings from a Community-based Vaccination Programme Against Influenza and Pneumococcal Disease for Seniors in Singapore

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Background & Hypothesis:
In Singapore, influenza and pneumococcal vaccine uptake rates in the elderly are very low. Our institution organised a community-based programme providing these vaccines at no cost to seniors, to encourage vaccine uptake and to monitor its impact on health outcomes.

Methods:
Our institution collaborated with multiple community-based and government stakeholders. Active recruitment was carried out using educational talks and engagement by our community partners. The events were sited at various community venues and comprised vaccinations given by our institution's Travel Clinic nurses, as well as educational sessions on healthy ageing topics.

Results:
Nine vaccination events were held from November 2015 to January 2016. A total of 656 seniors were vaccinated, with 636 receiving influenza vaccine and 632 receiving pneumococcal conjugate (PCV13) vaccine. The median age of participants was 72 years (interquartile range 62-77 years). Majority were female (64.6%), of Chinese ethnicity (84.4%), received primary school level education (42.4%), and resided in 1- or 2-room government housing rental flats (44.4%). Chronic disease prevalence was high, with 60.8% having hypertension, 57.6% having hyperlipidaemia and 28.1% having diabetes. Four percent reported influenza vaccination in the past year, and 4.3% reporting previous pneumococcal (PPSV23) vaccination. Post-vaccination, 1 patient reported systemic side effects (persistent rash for 1 month).

Discussion & Conclusion:
In this cohort of seniors, a high proportion came from the lower education and lower income strata. The burden of chronic disease was high and baseline vaccination rates were low. Community-based partnerships are a suitable means of recruiting such elderly participants for vaccination, to reduce their risk of severe illness from pneumonia and influenza.

CR-56

Improving the Knowledge and Attitudes of Community-dwelling Seniors towards Influenza, Pneumonia and Vaccination through Small Group Interactive Educational Sessions

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Background & Hypothesis:
In Singapore, the knowledge and attitudes of seniors towards influenza, pneumonia and vaccination are not well known. As part of a community-based vaccination programme, we organised health education sessions to educate seniors on these infectious disease topics.

Methods:
Nine community-based events were conducted. Seniors were engaged by volunteers from the Health Promotion Board using a small group interaction format. Health topics covered included influenza, pneumonia, and the importance of vaccination. Pre- and posteducation surveys were administered to evaluate the impact of the sessions.

Results:
A total of 604 seniors were included in our study. The median age of participants was 73 years (interquartile range 68-77 years); 397 (65.7%) were female and 518 (85.8%) were of Chinese ethnicity; 407 (67.4%) had received no formal education or up to primary school education, and 276 (44.4%) resided in 1- or 2-room HDB flats. The most common chronic diseases were hypertension (61.9%), hyperlipidaemia (57.8%) and diabetes (26.5%). Posteducation, seniors' total knowledge scores significantly increased (P <0.0001). Seniors were 1.76 to 5.80 times as likely to answer individual knowledge questions correctly (P <0.0001 for all questions) and 5 times as likely to agree that vaccinations could effectively prevent infectious diseases (OR = 5.00, 95% CI 2.59-10.59, P <0.0001). Majority (95.3%) indicated willingness to receive vaccinations again if provided free of charge. Majority (81.9%) preferred to receive vaccinations at a community venue.

Discussion & Conclusion:
Small group interactive education sessions improved the knowledge and attitudes of seniors towards influenza, pneumonia and vaccination, and may be useful to motivate seniors to adopt behaviours such as handwashing and yearly influenza vaccination.

CR-57

Factors Influencing Knowledge and Attitudes towards Influenza, Pneumonia and Vaccination among Community-dwelling Seniors in Singapore

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Background & Hypothesis:
As part of a community-based vaccination programme for seniors, we held a series of educational sessions on infectious diseases. We present the results of our intervention on the knowledge and attitudes of seniors towards influenza, pneumonia and vaccination.

Methods:
Nine community-based education sessions were held. Seniors were engaged on infectious disease topics by Health Ambassador volunteers from the Health Promotion Board, using a small group interaction format and simple educational aides. Pre- and posteducation survey results were used to evaluate the effectiveness of the intervention.

Results:
A total of 604 seniors were included in our study. The median age was 73 years (IQR 68-77 years); 397 (65.7%) were female and 518 (85.8%) were of Chinese ethnicity; 407 (67.4%) had received up to primary school education, and 276 (44.4%) resided in 1- or 2-room government housing flats; 457 (75.7%) had a history of hypertension, hyperlipidaemia and/or diabetes. The median knowledge score (maximum 9) improved from 5 (IQR 4-5) to 7 (IQR 5-7) postintervention ($P <0.0001$). Knowledge scores significantly improved across genders, age strata, education levels, and housing types. The median total attitude score also improved from 2 (IQR 1-3) to 3 (IQR 2-3) out of 3 ($P <0.0001$). On multivariable analysis, education level, housing type and presurvey scores were significantly associated with higher postsurvey knowledge scores, after adjusting for age and gender.

Discussion & Conclusion:
Small group interactive education sessions helped increase knowledge and change attitudes towards infectious diseases and vaccinations. Attention should be paid to demographics such as education level and income status when engaging seniors, to attain optimal results.

CR-58

Barriers and Facilitators towards Getting Influenza and Pneumococcal Vaccinations among Community-dwelling Elderly: A Qualitative Study

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Background & Hypothesis:
Influenza and pneumococcal vaccination uptake rates are low among seniors in Singapore. This qualitative study seeks to understand the barriers and facilitators towards receiving influenza and pneumococcal vaccinations among community-dwelling seniors.

Methods:
Four focus groups discussions (FGDs) were conducted in English, Mandarin, Malay, and Hokkien among seniors (n = 32) at a senior activity centre in September 2015. Topics explored included knowledge and perceptions of influenza, pneumonia and vaccinations; history of influenza/pneumococcal vaccination; motivators and barriers towards receiving influenza/pneumococcal vaccinations; and intention of getting free vaccinations during vaccination drives. FGDs were audio-recorded and expanded notes were developed, coded, and analysed using qualitative thematic analysis.

Results:
Most participants confused influenza with the common cold and pneumonia, and mistook pneumonia as tuberculosis or asthma. While they could state symptoms of influenza and pneumonia, participants cited polluted air, unhealthy food, and smoking as causes of these illnesses. Participants knew that they were susceptible to influenza and that pneumonia could lead to hospitalisation and death. However, they reported mixed attitudes towards vaccination. Main concerns were fear of side effects and possible contraindications to existing medical conditions. While some thought that vaccinations would boost their immunity and prevent illnesses, many questioned the necessity of vaccinations. Malay seniors appeared more receptive towards vaccination, likely due to previous experiences prior to performing the Haj.

Discussion & Conclusion:
Continuous educational outreach efforts are needed to improve knowledge and address misconceptions about respiratory illnesses and vaccinations among seniors to improve vaccine uptake. Potential facilitators for vaccination include subsidising vaccine costs and actively engaging seniors through healthcare providers.

CR-59

The Impact of Short Educational Messages in Motivating Community-dwelling Seniors to Receive Influenza and Pneumococcal Vaccines

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Background & Hypothesis:
Influenza and pneumococcal vaccination rates among community-dwelling seniors in Singapore are low. Our institution participated in a community-based health event for seniors to assess the knowledge, attitudes, practices and behaviours of seniors towards influenza and pneumococcal vaccines, and to promote vaccination.

Methods:
Institution staff performed a short verbal survey on influenza and pneumococcal vaccines with seniors, and subsequently provided an educational brief about the vaccines (including purpose, cost and availability) and invited them to receive vaccination at their local healthcare provider. Results were collated and analysed. Multiple logistic regression models were applied to determine factors associated with willingness to receive vaccination.

Results:
A total of 124 seniors were engaged. The median age was 70 years (IQR 63-76 years). Majority were female (83.9%) and of Chinese ethnicity (91.9%). Awareness of influenza and pneumococcal vaccines among seniors was 68.5% and 29% respectively. However, history of ever receiving these vaccines was only 25% and 8.1% respectively; 72 (58.1%) could state at least 1 benefit of vaccination. Following our educational brief, 82 (66.1%) would advise their friends to receive vaccination, and 86 (69.4%) stated willingness to receive vaccination. In seniors ≥65 years, ability to state at least 1 benefit of vaccination was significantly associated with willingness to be vaccinated, after adjusting for gender and history of vaccination (adjusted OR: 3.26; 95% CI, 1.20-8.85; *P* = 0.02).

Discussion & Conclusion:
Short educational messages are useful in motivating seniors to receive vaccination, especially among those with prior knowledge of their benefits, where supplementary information (such as vaccination schedule, cost, and access) may facilitate vaccine uptake.

CR-60

First Report on the Procedural Safety and 6-Month Outcome of Patients Treated with 48 mm Everolimus Eluting Stent

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Background & Hypothesis:
Implanting a single ultra long stent to treat long lesions has the benefit of avoiding stent overlap, geographical miss and possible cost savings to the patient. We evaluated the procedural safety and clinical outcome at 6 months of patients with long coronary lesions treated with the 48 mm Xience Xpedition everolimus drug eluting stent (EES).

Methods:
Patients who had at least one 48 mm EES implanted during percutaneous coronary intervention between November 2013 to May 2015 were followed up at 1 month and 6 months after the procedure. Procedural data were recorded prospectively. Hard end points include cardiac death, myocardial infarction (MI), target lesion revascularisation (TLR) and stent thrombosis.

Results:
Seventy-six patients (59 males, mean age 60.4 years) were included in the study. A total of 80 EES were implanted. The mean stent diameter was (2.98 +/-0.4 mm) and the mean stent length was (60.51+/-20.4 mm); 27 (35.5%) patients were diabetic, 57 (75%) had hypertension, 54 (71%) had hyperlipidaemia and 27 (35.5%) were smokers. Device success rate was 95.6% and there were no procedural complications during implantation. There was 1 probable stent thrombosis resulting in (1.3%) cardiac death. At 6 months, 1 (1.3%) patient was admitted for decompensated heart failure and was treated medically. At 6 months follow-up, 97.3% of patients remained event-free with no ischaemia-driven TLR.

Discussion & Conclusion:
We demonstrated the high device success rate of a novel 48 mm EES in a group of patients with complex anatomy. The stent appeared to be safe and effective at 6 months with low clinical events.

CR-61

Mapping the Volume Trajectories of Subregions of Limbic Structures: Cross-Diagnostic Comparisons of Schizophrenia and Bipolar Disorder

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Background & Hypothesis:
Recent large scale, cross-sectional studies of whole brain structures in schizophrenia pinpointed the largest volume deficit in 2 regions: the hippocampus and amygdala. However, these limbic structures are anatomically heterogeneous. We hypothesise that the substrate of psychosis involves specific hippocampal-amygdalar subregions. Hence, we sought to identify a shared psychotic substrate by mapping the volume trajectories of hippocampal-amygdalar subregions across 2 common psychotic disorders of schizophrenia and bipolar disorder.

Methods:
Structural MRI scans were acquired from 38 patients with schizophrenia, 20 bipolar patients with psychotic features, and 44 healthy control subjects. These subjects were followed up 1-7 years later. A novel hippocampal-amygdalar segmentation probabilistic algorithm (derived from ultra-high field scans of the postmortem tissue) was applied to extract the 7 hippocampal and 4 amygdalar subregions on each hemisphere. Mixed-effects modelling was applied to test group differences in baseline volume and volume over time.

Results:
At baseline, volume deficits of the left CA1 hippocampal subfield and bilateral lateral amydaloid nuclei were found in both schizophrenia and bipolar subjects, compared with healthy controls. Over time, volume decline were found in CA1, CA3 and molecular layer of the hippocampus in the schizophrenia subjects, but not the bipolar subjects. In contrast, no amygdalar subregion volume changes over time were observed in both illnesses.

Discussion & Conclusion:
The shared abnormalities in localised hippocampal-amygdalar (CA1/lateral nuclei) subregions suggest a common substrate of psychosis. Divergent findings of widespread hippocampal changes in schizophrenia—but not bipolar disorder—may underlie the more severe progression of psychosis in schizophrenia.

CR-62

A 5-Year Retrospective Cohort Study Comparing End-Stage Renal Failure (ESRF) Patients and Non-ESRF Patients with Infective Endocarditis

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Background & Hypothesis:
Infective endocarditis (IE) can have serious complications and affects both ESRF and non-ESRF patients. Our aim was to identify differences in characteristics and risk factors for mortality between the 2 groups.

Methods:
We conducted a 5-year retrospective review of all IE episodes.

Results:
Seventy-two episodes of IE occurred in 68 patients; 26 (36.1%) occurred in ESRF patients. Median age, gender and ethnicity were similar. More ESRF patients had hypertension, diabetes mellitus, ischaemic heart disease, and methicillin-resistant *Staphylococcus aureus* (MRSA) colonisation. More ESRF patients had ≥1 of the following in the 90 days prior to admission for IE; hospitalisation (69.2% vs 15.2%, P <0.001), bacteraemia (23.1% vs 2.2%, P <0.01) and catheter-related procedures (80.1% vs 8.7%, P <0.001). ESRF patients had more MRSA infections (23.1% vs 4.3%, P = 0.02) and right atrial wall involvement (69.2% vs 6.5%, P <0.001). Overall mortality and complications were similar between both groups. Septic shock was associated with mortality in both ESRF (OR: 10.7; 95% CI, 1.7-66.7; P = 0.02) and non-ESRF patients (OR: 38.5; 95% CI, 4.33-342.0; P <0.001). Mortality in ESRF patients was associated with MRSA colonisation (OR: 7.0; 95% CI, 1.2-40.8; P = 0.04), more catheter-related procedures (3.5 vs 1, P = 0.02) and longer length of hospitalisation 90 days prior to admission (20 vs 2 days, P = 0.04). In contrast, mortality in non-ESRF patients was associated with prior diabetes with end-organ damage (OR: 9.7, 95% CI, 1.00-95.67; P = 0.04), heart failure (OR: 9.67; 95% CI, 1.00-95.67; P = 0.04), stroke (OR: 1.33; 95% CI, 1.00-1.77; P = 0.01), higher median creatinine (124 vs 69.5, P = 0.03), higher median Charlson Comorbidity Index Score (2.5 vs 0.5, P = 0.01), disseminated infection (OR: 5.35; 95% CI, 1.03-27.82; P = 0.05) and non-surgical management (OR: 0.08; 95% CI, 0.01-0.76; P = 0.02).

Discussion & Conclusion:
While there was no difference in mortality and complications between ESRF patients and non-ESRF patients with IE, risk factors for mortality were different.

CR-63

Cardiovascular Risk Assessment Using LOX-Index and Self-Rating Depression Scale

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Background & Hypothesis:
LOX-Index is a novel biomarker for cardiovascular disease (CVD) and is calculated by multiplying LOX-1 ligands containing apolipoprotein B (LAB) and soluble LOX-1 (sLOX-1). The Framingham Risk Score (FRS) is a common clinical tool for risk assessment of coronary artery disease. Mental stress can also be an important risk factor for CVD. The purpose of this study was to examine the relationship between LOX-Index and FRS or mental stress.

Methods:
LOX-Index was measured in 453 subjects including 150 consecutive outpatients with lifestyle-related diseases such as diabetes, hyperlipidaemia, and hypertension and 303 healthy volunteers. Mental stress was evaluated by the Self-Rating Depression Scale (SDS).

Results:
LOX-Index was significantly related with a 10-year risk of FRS. Multiple regression analysis demonstrated that LAB was closely associated with the smoking status, low-density lipoprotein (LDL), and high-density lipoprotein (HDL). There were no significant associations between LOX-Index and the SDS scores; however, by simultaneously using LOX-Index and SDS, the subjects could be classified in terms of oxidative stress and mental stress.

Discussion & Conclusion:
LOX-Index appears to be a comprehensive marker that could evaluate the status of multiple CVD risk factors. The classification with LOX-Index and SDS could contribute to the risk assessment for CVD.

CR-64

Effect of Modulated Electro-Hyperthermia on the Pharmacokinetics of Oral Transmucosal Fentanyl Citrate in Healthy Subjects

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Background & Hypothesis:
A single oral dose of fentanyl, a widely available analgesic, is effective for the management of cancer pain. In combination with modulated electro-hyperthermia (mEHT), fentanyl is even more effective in relieving pain. In this study, we determined whether changes occur in fentanyl absorption and disposition when administered in conjunction with electro-hyperthermia treatment.

Methods:
A randomised, single-dose, cross-over, open-label study was used to investigate the effect of mEHT on the pharmacokinetic properties of fentanyl in 12 healthy volunteers. The 12 healthy volunteers were each administered a single dose of oral transmucosal fentanyl citrate (OTFC) or a single dose of OTFC with mEHT. mEHT was performed on the abdomen for 1 hour. Blood samples were collected for 24 hours after dosing. The temperature of the abdominal skin surface was assessed predose and at 10, 20, and 60 minutes after dosing.

Results:
Geometric mean ratios (GMRs: fentanyl with mEHT/fentanyl alone) and associated 90% confidence intervals (CIs) for the maximum plasma concentration (Cmax) and area under the curve at the last sampling time (AUClast) were 1.1984 (1.0881-1.3198) and 1.1466 (0.9858-1.3335), respectively. The average temperature of the abdominal skin surface increased by approximately 4°C.

Discussion & Conclusion:
There was an increase in the overall exposure to the drug without implications of any clinical significance. OTFC can be administered without limitations in combination with mEHT, and it is not necessary to modify the dosing regimen.

CR-65

Stigma in Mental Illness in a General Hospital in Singapore

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Background & Hypothesis:
The Singapore Mental Health Study found that more than 10% of Singaporeans will suffer from a mental illness in their lifetime, yet the majority never seek help. One of the main factors leading to patients not seeking treatment is the stigma that surrounds mental illness.

Methods:
Outpatients at Tan Tock Seng Hospital (TTSH) seen by a psychiatrist at least once in the last 1 year were invited to take the survey. Inclusion criteria: 1) receiving psychiatric care in TTSH, and 2) able to communicate in English and/or Mandarin. Exclusion: 1) patients who are not able to communicate in English or Mandarin, and 2) patients suffering from dementia. Demographics and Internalized Stigma of Mental Illness Inventory (ISMI) scale was completed. The treating psychiatrist was asked to confirm the diagnosis.

Results:
Two-thirds (68%) was female, 78% less than or equal to 60 years old, 82% chinese ethnicity, 42% employed, 57.7% married, 73.7% had more than 6 years of education, 28.5% were on follow-up for 10 years or more. Anxiety disorder was the commonest (38%), followed by depression (36.5), psychotic disorder (13.9%), bipolar disorder (6.6%); 55.5% experience alienation, 44.5% stereotyped endorsement, 43.8% discrimination, 59.1% social withdrawal and 71.5% stigma resistance. Depression and psychotic disorders had the highest mean total ISMN score. There was no significant difference in total ISMNI score between psychotic disorders and other disorders, anxiety disorders and the other disorders when comparing the discrimination experience and stereotype endorsement.

Discussion & Conclusion:
Up to 71.5% experienced some form of stigma. No difference in severity was found based on mental illness.

CR-66

Views on Managing Alcohol Withdrawal in a General Hospital: Are They Any Different between Doctors and Nurses?

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Background & Hypothesis:
Alcohol withdrawal (AW) among patients in a general hospital is common. Failure to recognise and treat leads to increase mortality and morbidity. Doctors and nurses form the core medical team managing such patients. Understanding their perspectives on the current gaps, needs and potential interventions are important.

Methods:
An anonymous survey was conducted among doctors and registered nurses in Tan Tock Seng Hospital. Response rates were 40% and 94% for doctors and nurses respectively. Responses between doctors and nurses were compared.

Results:
The majority in both groups were between the ages of 25 and 39, had greater than 5 years of training and managed 0-3 cases/month. Significantly higher percentage of nurses had interest in further training ($P <0.0002$) and would be more comfortable if education and training was provided ($P <0.0002$). Significantly more doctors preferred more training in acute management ($P <0.0002$) and were more comfortable in managing if a protocol was available ($P <0.0002$). A higher proportion of doctors felt competent managing AW ($P <0.0002$) and was aware of referral resources following acute treatment ($P = 0.006$). A higher proportion of nurses felt that managing AW was a valuable skill ($P <0.0002$). Despite no statistical differences in areas of having managed AW before, requiring more training in identifying high risk patients, being a part of core training, learning how to manage AW being a part of their job scope and that it was not a difficult topic to learn a high percentage endorsed importance.

Discussion & Conclusion:
Personalising approaches on systematic intervention at a hospital level are paramount to maximise benefits.

CR-67

The Last Masquerader – Cutaneous Non-Tuberculous Mycobacterial Infection

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Background & Hypothesis:
Cutaneous non-tuberculous mycobacterial infections are increasingly reported in the medical literature. These are usually acquired from the environment and may affect both immunocompetent and immunocompromised patients. Clinical manifestations can be polymorphous, resulting in delayed diagnosis.

Methods:
We performed a retrospective case notes review of 3 patients who presented with non-specific skin rash or lesion, eventually diagnosed to be non-tuberculous mycobacterial infection based on acid-fast bacilli (AFB) cultures or DNA probe assay. Data on patient demographics, clinical features, investigation results and treatment was collected.

Results:
Clinical presentations include a 68-year-old Chinese male with right upper limb scaly erythematous macules and papules, some coalescing to plaques, a 87-year-old Indian male with left forearm solitary erythematous plaque and a 17-year-old Chinese female with right cheek acneiform cyst. Mycobacterium species identified include 2 cases of *M. haemophilum* and 1 case of *M. chelonae* complex. Antibiotics used include prolonged courses of clarithromycin, ciprofloxacin, rifampicin and clofazimine, with partial to complete response.

Discussion & Conclusion:
It is important to consider cutaneous non-tuberculous mycobacterial infection as a clinical differential for non-specific skin rash or lesion in the right context, as manifestations can be protean. Skin biopsy for histology and tissue AFB culture or DNA probe assay is helpful if clinically suspected. A delayed diagnosis will correspondingly delay treatment, which comprises prolonged courses of antibiotics.

CR-68

Quality of Life Assessment in Patients after Entropion Repair

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Background & Hypothesis:
Few studies have analysed the quality of life (QOL) after lower eyelid entropion surgery (LEES). We thus reviewed the effect of LEES on QOL and analysed the factors associated with a poorer postoperative QOL.

Methods:
Consecutive patients from 2 centres who underwent LLES by a single surgeon in 2004-2007 were recruited. LEES was defined as lower eyelid retractor repair alone or with additional lateral tarsal strip (LTS). The EuroQol-5 Dimension (EQ-5D), EuroQol-Visual Analogue Scale (EQ-VAS) and Utility Value (UV) questionnaires were administered via phone interview by a single interviewer postoperatively. The UV score were derived using the time tradeoff (TTO) and standard gamble (SG) methods.

Results:
Sixty-one eyelids of 61 patients were evaluated. The mean EQ-5D, EQ-VAS and TTO and SG scores were 90.8 ± 16.7, 74.8 ± 14.2, 0.79 ± 0.22 and 0.94 ± 0.072, respectively. Multivariate analysis showed the mean EQ-VAS score for patients who underwent additional LTS was 10.2 (95% CI, 3.38-17.1; $P = 0.004$) lower than those who underwent isolated retractor repair. The mean EQ VAS score for patients with bilateral and recurrent entropion was 10.8 (95% CI, 3.8-17.9; $P = 0.005$) and 27.1 (95% CI, 8.4-45.7; $P = 0.01$) lower compared to those with unilateral entropion and no recurrence respectively. Patients with positive family history had 0.18 (95% CI, 0.015-0.34; $P = 0.03$) lower mean TTO score compared to those without. Male gender and higher education level were statistically associated with a lower SG mean score.

Discussion & Conclusion:
Males, higher education, positive family history, additional LTS and bilateral or recurrent entropion were preoperative factors associated with poorer QOL.

CR-69

HbA1c Retention Times and Area Percentages on High Performance Liquid Chromatography as a Tool for Identification of Analytical Errors

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Background & Hypothesis:
HbA1c measurement is important for diabetes management, however it is affected by haemoglobin variants and other interferences. HbA1c testing on high performance liquid chromatography (HPLC) allows review of these interferences so we collated retention times and concentrations of all haemoglobin components on HPLC for reference range determination.

Methods:
HbA1c samples sent to National University Hospital laboratory measured using Bio-rad VARIANT[TM] TURBO 2.0 HbA1c kit were reviewed from April-May 2016. Data of area percentages and retention times for all peaks were collated and statistical analysis of median and standard deviation (SD) of each peak was determined using Microsoft Excel. The median ± 2SD formed the reference range for each haemoglobin component and was used to screen HbA1c results.

Results:
A total of 1602 HbA1c chromatograms were reviewed and the median (2SD) area percentage values for A1a, A1b, HbF, LA1c, P3, P4 and Ao were 1.2 (0.36), 1.2 (0.68), 1.2 (0.80), 1.9 (0.48), 6.2 (2.05), 3.8 (0.83), 1.3 (0.33) and 84.5 (5.18). The median (2SD) retention times were 0.17 (0.05), 0.24 (0), 0.27 (0.01), 0.40 (0.01), 0.50 (0.01), 0.79 (0.02), 0.87 (0.02) and 1.02 (0.01). Out of 687 HbA1c requests reviewed over a week, 26 were identified using the reference ranges; 8 had hemoglobinopathies (6 HbE, 1 Hb Hope, 1 HbD/G/Q) and 1 had elevated HbF. High P3 was associated with high urea and creatinine concentrations.

Discussion & Conclusion:
Reference ranges determined for haemoglobin components on HPLC using large number of patient samples allowed us to screen for analytically abnormal HbA1c results and identify interferences.

CR-70

Late-Onset Vitiligo: Characteristics and Treatment Response

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Background & Hypothesis:
The onset of vitiligo in old age is uncommon, and there is a dearth of evidence on the disease in this patient subset. This study aims to describe the clinical characteristics and treatment response of patients with late-onset vitiligo in our population.

Methods:
We retrospectively studied the profile of all patients diagnosed with late-onset vitiligo, defined as being aged 50 years and over at the point of clinical onset, from 1 January 2010 through 31 December 2014. Information obtained included patient demographics, characteristics of vitiligo, family history, as well as the treatment response.

Results:
Out of a total of 3128 patients diagnosed with vitiligo, 461 (14.7%) patients had late-onset disease. There were more females (n = 260, 56.4%), and the average age of onset was 59.4 ± 7.4 years. Most patients were Chinese (n = 308, 66.8%), and had Fitzpatrick skin types III (n = 151, 32.8%) or IV (n = 143, 31%). Almost 1 in 10 patients had a history of other autoimmune disease. The majority of patients had non-segmental vitiligo (n = 436, 94.6%), of which focal vitiligo was the most common subtype. Table I details the clinical characteristics of our patients. Treatment response was evaluated in 359 patients. The 3 main treatment modalities were topical creams, phototherapy and surgical grafting. Combination with topical creams and phototherapy yielded the best clinical result (P <0.001), but the choice of phototherapy did not significantly affect response (P = 0.851). Table II details the treatment response in our patients.

Discussion & Conclusion:
Late onset vitiligo has clinical characteristics distinct from earlier-onset disease. Combination treatment with phototherapy is an effective treatment.

CR-71

Bile Duct Injuries, Our Experience at Tan Tock Seng Hospital

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Background & Hypothesis:
Since the introduction of laparoscopic cholecystectomy, incidence of bile duct injuries (BDI) has been on the rise, with a 4 times the risk as compared to open cholecystectomy. Litigations involving BDI were ruled in the patients' favour in 80% of the time, with significant incurred costs per case. We aimed to establish an incidence of BDI in our institution, examine patients' characteristics, review the clinical management, and the long-term morbidity of these patients.

Methods:
A retrospective collection of sample population from the medical records office from 2005-2016, with key words: bile duct injuries; laparoscopic converted to open cholecystectomy; hepatico-jejunostomy; bile leak.

Results:
A total of 9335 patients underwent laparoscopic cholecystectomy. The incidence of BDI was 0.29% (27). The mean age was 68 years. The mean follow-up period was 73 months; 22% (6) of these cases were performed in an emergency setting. Intraoperative cholangiogram were performed in 63% (17) of these cases; 81% (24) BDI were discovered intraoperatively. The types of BDI were: Strasberg A (3), B (0), C (2), D (12) and E (10). Management for these patients were primary repair (12), hepatico-jejunostomy (13), ERCP with biliary stent (1) and laparotomy with biliary stent insertion (1). Mortality rate was 14.8% (4). Morbidity were hepatico-jejunostomy complications requiring re-laparotomy 11.1% (3) and repeated biliary sepsis 11.1% (3).

Discussion & Conclusion:
BDI remains a serious complication of laparoscopic cholecystectomy, carrying a significant morbidity and mortality rate.

CR-72

Factors Predicting for Local Recurrence After Wide Local Excision

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Background & Hypothesis:
Women treated with wide local excision (WLE) and whole breast irradiation (RT) have a 10 to 20% risk of ipsilateral breast recurrence (LR). Adequacy of pathological margins and postoperative RT are reported to be the strongest predictors. We aimed to evaluate the pattern of LR and to identify other predictive factors, apart from margins and RT.

Methods:
Retrospective review of 579 female patients, diagnosed with breast cancer (145 with ductal carcinoma in-situ, DCIS, and 434 with invasive carcinoma) from 2004 to 2009 was performed. All women underwent WLE and 489 (84.5%) received RT. All were followed up for at least 5 years.

Results:
Ipsilateral LR developed in 65 women (11.2%). The LR occurred in the same quadrant as the initial cancer in 40 women (61.5%), elsewhere in the breast for 16 (24.6%) and in the ipsilateral axilla in 9 (13.8%). Postoperative RT and hormonal therapy were important predictors of LR (P <0.01). Adequacy of pathological margins was important in DCIS (P = 0.02), but not in invasive cancers where nodal involvement was predictive (P <0.05). On multivariate analysis, margins, nodal status, postoperative RT and hormonal therapy were independent predictors of LR. In invasive cancers, LR was associated with shorter distant recurrence-free (P <0.01; HR: 10.49; 95% CI, 62.62-535.4) and overall survival (P <0.01; HR: 4.22; 95% CI, 4.60-29.22).

Discussion & Conclusion:
Locoregional recurrence developed in 11.2% of women after WLE. Risk is increased in those with inadequate margins, node-positive cancers, and who do not complete radiotherapy or hormonal treatments.

CR-73

A Ten-Year Review on the Endoscopic Treatment of Sinonasal Inverted Papilloma in a Singaporean Restructured Hospital

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Background & Hypothesis:
Sinonasal inverted papilloma are benign tumours characterised by their tendency to recur, destructive capacity to surrounding structures and risk of malignant transformation. Treatment has moved from open approaches to endoscopic surgery in recent years. We evaluated endoscopic treatment outcomes in the local Singaporean context.

Methods:
We retrospectively reviewed all cases of inverted papilloma treated endoscopically at our centre over a 10-year period from 2003 to 2013. Demographic data, clinical features, radiological findings, surgical procedures, recurrence rate and malignant transformation were assessed.

Results:
A total of 29 patients aged 22 to 86 years old, mean of 57.55 ± 16.38 years, were treated. There was a gender predilection to males, at 2.1:1. The ethnic composition of our patient group was 82.8% Chinese, 6.9% Indians, 10.3% Others. The commonest presenting symptom was unilateral nasal obstruction. Site of disease was most commonly the lateral nose 61.3% (n = 19). There was 1 case of synchronous malignancy. No metachronous malignancy was seen within the study period. Mean hospital stay was 2.68 ± 1.52 days. Surgical complications including postoperative bleeding, postoperative infection, numbness, nasal regurgitation, septal perforation and cardiac complications were seen in 11 cases. Mean follow-up duration was 3.67 ± 2.73 years. The recurrence rate was 16.7% (n = 5).

Discussion & Conclusion:
Endoscopic resection is a well accepted approach in the treatment of sinonasal inverted papilloma and has largely replaced radical open approaches, except in selected cases of extensive diseases and malignancies. The outcomes achieved in our centre are similar to those of other international centres. Lifelong follow-up is mandatory for early detection of recurrence and malignant transformation.

CR-74

Safety and Efficacy of the Emprint™ Microwave Ablation System of Hepatic Tumours: Analysis of 33 Patients

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Background & Hypothesis:
The Emprint™ system (Emprint™ Microwave Ablation System, Covidien) is designed to create spherical microwave ablation zones for hepatic tumours. We noted a lack of literature and sought to study its safety and efficacy in the long term.

Methods:
We conducted a retrospective analysis of percutaneous hepatic tumour ablations using Emprint™ conducted over a 2-year period comprising a total of 37 percutaneous microwave ablations of hepatic tumours. We recorded the technical success rate, ablation duration, number of passes, intraprocedure and postprocedure complications and categorised them using the Society of Interventional Radiology (SIR) Complication Grading. We analysed the efficacy of Emprint™ (as defined by treatment response and recurrence on 6-week postablation follow-up), using the modified Response Evaluation Criteria in Solid Tumours (mRECIST) grading.

Results:
Thirty-two patients received 37 Emprint™ ablation procedures. Technical success was 97.3%. Mean total ablation duration was 8.20 minutes and median number of passes made was 1. Amongst successful ablations, complication rate was 30.6% (25/36) and there was no mortality. Among those with complications (n = 11), 66.7% had minor complications while the remainder 33.3% had major complications. Regarding efficacy, complete response, partial response, stable disease and progressive disease rates were 77.4%, 12.9%, 3.2% and 6.5% respectively.

Discussion & Conclusion:
The results confirm the safety and efficacy of percutaneous Emprint™ microwave ablation technology. The low major complication rate and high complete response rate on follow-up supports its efficacy.

CR-75

Outcomes of Laparoscopic versus Open Inguinal Hernia Repair Techniques in Established Recurrent Inguinal Hernias

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Background & Hypothesis:
Inguinal hernia repair is a frequently performed elective surgery. Incidence of recurrent inguinal hernia (RIH) is reported to be between 0.5 to 10%. Surgery for RIH is challenging with increased morbidity risk. We report our experience in managing RIH. We aimed to study the outcomes of RIH repair at Tan Tock Seng Hospital (TTSH).

Methods:
A retrospective review of all patients managed with RIH at TTSH from 2005-2015 was performed. This study was approved under exempt category by local institutional review board. Demographic data, operative data for index surgery and outcomes of RIH surgery were recorded. Time to recurrence and surgical approach (open versus laparoscopic repair) was documented.

Results:
A total of 400 RIH surgeries were performed at TTSH over the study period. The mean age of patient was 64 years (range 19-90) and majority were males (97.5%); 62 (38.2%) patients had a known positive smoking history. Index hernia surgery was performed by open approach in 73.2% and by laparoscopic approach in 26.7% of patients. Mean time to recurrence was 52 months (range 0.5-636). The RIH was performed via open approach in 57.1% and by laparoscopic approach in 42.9%; 40.3% of patients with index open repair were managed by laparoscopic repair during RIH surgery; 94% of patients with index laparoscopic repair were managed by open repair during RIH surgery.

Discussion & Conclusion:
RIH surgery remains challenging. Laparoscopic approach for an index open inguinal hernia surgery is not always performed. We discuss the issues that compel surgeons to deviate from standard recommendations.

CR-76

First Report on the Use of a Polymer-free Biolimus-coated Stent in Primary Angioplasty for ST Elevation Myocardial Infarction

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Background & Hypothesis:
Leaders Free Trial demonstrated that Biofreedom, a biolimus-coated stent (BCS), to be superior to bare metal stent when used with a 1-month course of dual antiplatelet therapy (DAPT) in high bleeding risk patients (pt). This is the first local report of its use in ST elevation myocardial infarction (STEMI) patients.

Methods:
We analysed data from 122 consecutive STEMI patients who underwent primary percutaneous coronary intervention using BCS. The primary endpoint of the study was major adverse cardiac events, which is a composite of cardiac death, myocardial infarction, target lesion revascularisation, target vessel revascularisation and stent thrombosis at the end of follow-up. The clinical outcomes were evaluated at 6 months.

Results:
Eighty-six percent of the patients were males; 57.4% of patients presented with anterior STEMI. Mean ejection fraction was $42.8 \pm 9.2\%$. Preprocedural thrombolysis in myocardial infarction (TIMI) flow was 0 in 82.7% of the patients. After BCS implantation, TIMI 3 flow was restored in 99.2% of patients. At 6 months, major adverse event rate were 3 (2.5%) of which 2 were stent thrombosis and 1 case requiring target vessel revascularisation. One case of myocardial infarction leading to cardiac death was observed. A total of 6 patients had premature DAPT interruption between 30 and 90 days, with one of them leading to cardiac death.

Discussion & Conclusion:
Our preliminary experience showed that the use of polymer-free BCS as primary device for STEMI patient in PPCI was feasible and associated with a high rate of final TIMI 3 flow and low 6-month event rate.

CR-77

Cytoreductive Surgery (CRS) and Heated Intraperitoneal Chemotherapy (HIPEC) for Peritoneal Surface Malignancies: Early Experience of a Public Healthcare Institution in Singapore

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Background & Hypothesis:
Historically, patients with peritoneal surface malignancies face a dismal prognosis with palliative chemotherapy alone. CRS/ HIPEC has gained increased traction among oncologists as an acceptable treatment since its introduction in early 2000s. Patients who receive CRS/HIPEC have a median survival of more than 20 months.

Methods:
This is a retrospective review of all CRS/HIPEC cases performed over a 52-month period (1 January 2012 to 31 May 2016) in a tertiary healthcare institution in Singapore. Suitable patients were identified in a multidisciplinary meeting and referred to surgical oncology for consideration of CRS/HIPEC.

Results:
Thirteen patients were identified to be suitable for CRS/HIPEC; 7 patients had mucinous carcinoma; 3 patients had peritoneal metastases from colorectal adenocarcinoma; 2 patients had primary peritoneal serous carcinoma and 1 patient had malignant peritoneal mesothelioma. Patients were predominantly female (61.5%) with a median age of 63 years. Two patients underwent diagnostic procedures without further CRS/HIPEC; 3 patients underwent CRS only and 8 patients received both CRS and HIPEC. There were no postoperative mortalities. Four patients died subsequently due to disease progression. Amongst the 11 patients who received CRS, their peritoneal carcinoma index (PCI) score ranged from 3 to 39. Five of them (46%) experienced postoperative morbidity. To date, the longest survival time is 29.2 months.

Discussion & Conclusion:
CRS/HIPEC was performed commonly for malignant mucinous neoplasm. Challenges we faced whilst introducing CRS/HIPEC were mainly related to safety, clinician unfamiliarity and equipment availability. With increased experience and introduction of operative safety protocols, CRS/HIPEC is a safe treatment for patients with peritoneal surface malignancies.

CR-78

The Impact of CYP2D6 Testing in Local Women with Hormone Responsive Breast Cancer

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Background & Hypothesis:
CYP2D6 variants with reduced function are associated with tamoxifen failure. Aromatase inhibitors (AIs) are more appropriate in these patients, but many still opt for tamoxifen because of concerns over cost and AI-induced osteoporosis. We evaluated whether CYP2D6 genotyping aids the selection of hormonal agent, and examined the prevalence of AI-bone loss.

Methods:
Seventy female patients with hormone responsive breast cancer were prospectively recruited and genotyped for CYP2D6. Poor metaboliser (PM) phenotype was defined as homozygous or compound heterozygous for 2 PM alleles (*4, *5, *6); IM phenotype as homozygous for 2 IM alleles (*9, *10, *41) or heterozygous PM/IM allele; all other combinations were considered normal variants. Bone density was evaluated in another 187 female patients treated with AIs from 2006 to 2014.

Results:
Fifty-two patients (74.2%) were of IM phenotype, 18 of normal phenotype, and none were of PM phenotype. Based on genotyping, 43 of 52 (82.7%) patients of IM phenotype opted for AIs; 13 of 18 (72.2%) of patients with normal variants also chose AIs. Over a 3-year follow-up, AIs were discontinued in 8 patients because of side effects and in 1 patient who developed recurrence. Two other patients developed recurrence (1 on AI, 1 on tamoxifen). Osteoporosis developed in 20 of 187 patients (10.7%) patients while on AIs; 2 were switched to tamoxifen while 1 discontinued hormonal therapy completely.

Discussion & Conclusion:
Aromatase inhibitors are likely more effective in our population where the prevalence of IM phenotype is high. Risk of AI-induced osteoporosis is considerably low.

CR-79

Mortality and Cardiovascular Complications of Severe Community-acquired Pneumonia Presenting to the Intensive Care Unit

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Background & Hypothesis:
Cardiovascular comorbidity is not uncommon in an episode of severe community-acquired pneumonia (SCAP). The inflammatory reaction incited by SCAP results in increased platelet adhesiveness, and the tendency to developing cardiovascular complications during an episode of SCAP increases.

Methods:
We retrospectively analysed consecutive admissions for SCAP to our Intensive Care Unit (ICU), and collected data on cardiovascular complications occurring at the time of admission.

Results:
A total of 547 patients were admitted for SCAP from 2012-2015. Average age was 67.4 years. The average ICU length of stay was 6.16 days; 181 of these patients died in ICU; 44 presented with a concurrent myocardial infarction, 36 with heart failure, 60 had arrhythmias including atrial fibrillation and 3 had a stroke. There was a significantly increased mortality rate in this group of patients.

Discussion & Conclusion:
Cardiovascular comorbidity during an episode of SCAP is not an uncommon occurrence. SCAP increases cardiac workload as a result of the systemic inflammatory reaction syndrome. This can result in myocardial infarction and arrhythmias in already predisposed patients. Pneumonia also increases the circulating levels of pro-inflammatory cytokines resulting in increased platelet adhesion and endothelial changes which can result in acute coronary syndromes. In addition, pro-inflammatory cytokines suppress ventricular function. Clinicians need to be aware that such phenomena increase the risk of patient mortality and morbidity.

CR-80

Hypoxemic Respiratory Failure: A Case Series of ECMO Referrals

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Background & Hypothesis:
ECMO (extracorporeal membrane oxygenation) is a new weapon in the armamentarium of the intensive care physician. With the availability of ECMO, patients with refractory hypoxemic respiratory failure can be managed and the risk of ventilator-induced lung injury from high ventilator pressures can be reduced.

Methods:
We retrospectively analyse consecutive admissions for hypoxemic respiratory failure fulfilling ECMO referral criteria, and collect data on the rescue ventilator strategies and outcomes of ECMO.

Results:
Six patients who fulfilled ECMO referral criteria were identified. The time taken from identification of ECMO referral criteria to the time of ECMO initiation ranged from 1.5 hours to 30 hours. Ventilatory strategies before initiation of ECMO included the low tidal volume ARDSNet approach, elevated PEEP in accordance with LOVS and ALVEOLI studies, APRV, prone ventilation and neuromuscular blockade. Upon initiation of ECMO, duration of ECMO cannulation ranged from 4 to 11 days. Complications included vascular injury, ischaemic stroke, intracranial haemorrhage and hemodynamic instability. There were 2 deaths.

Discussion & Conclusion:
ECMO is a modality of treatment which may be able to salvage a patient with hypoxemic respiratory failure. Before initiation of ECMO, appropriate ventilator techniques should be applied. ECMO is not without harm and complications related to anticoagulation and cardiovascular morbidity are not uncommon. Due consideration should be given to patient selection in order to attain good outcomes.

CR-81

Analysis on Risk Factors of Falling

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Background & Hypothesis:
Falls are becoming a major public health problem among older adults in Singapore with the population ageing rapidly. Hence, it is important to identify older adults who are at risk of falling and their risk factors for falling presenting to a tertiary hospital's emergency department (ED).

Methods:
This is a case control study of 78,917 patients who were admitted to a tertiary hospital's ED from 1 January to 31 December 2013. Nine risk factors were taken into consideration, which were polypharmacy, fragility fracture and diabetes mellitus, etc. Participants' previous diagnoses were reviewed from the hospital's EMR database from 2010 to 2013 for identification of risk factors.

Results:
The prevalence of those risk factors increased with age. Polypharmacy, diabetes mellitus (DM) and arthritis were the 3 most important risk factors and their prevalence rates were 49%, 28.2% and 9% respectively among those patients aged 65 and above. When risk factors were grouped, only 0.9% of them for the age group 0-64 had 3 or more risk factors while 13.4% for those aged 65 and above. Of 4798 patients who had falls-related diagnoses in ED, 741 (15%) were discharged directly from A & E without follow-up.

Discussion & Conclusion:
Older adults had higher numbers of risk factors compared to the younger population and in this group of patients presenting to ED, polypharmacy, the presence of DM and arthritis were the most important risk factors. This has implications on directing more intensive falls prevention on this group of patients.

CR-82

Improving the Detection of Retinal Pathologies: A Comparison of Novel Ultra-Widefield Imaging to Standard Fundus Imaging

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Background & Hypothesis:
Standard fundus photography (covering 30 to 60 degrees of the retina) is used for screening and documentation of eye diseases, but has been shown to miss a significant portion of sight-threatening peripheral retinal pathologies. Ultra-widefield device (200 degrees) allows more complete visualisation of the peripheries. We compared ultra-widefield imaging with conventional photography for detecting retinal pathology in eyes with retinal diseases.

Methods:
In a prospective study, clinical examination was performed on 78 patients diagnosed with myopic degeneration or age-related macular degeneration (AMD), following which fundus imaging was performed using standardised protocols. Ultra-widefield images and standard photographs were graded by masked graders, and specific retinal pathologies were identified. The sensitivity and specificity of ultra-widefield and standard photographs were compared against clinical examination.

Results:
Using ultra-widefield imaging, additional peripheral lesions which could not be imaged using standard photographs were detected in 92.5% of AMD patients and 89.3% of myopes. Lesions which were completely undetectable on standard photographs, but identified using ultra-widefield, were present in 46.8% of all patients (62.2% of myopes and 32.5% of AMD patients). The sensitivity of ultra-widefield imaging was higher (range, 78.6%-100% for different pathologies) compared to standard photographs (0%-33.3%).

Discussion & Conclusion:
Ultra-widefield imaging detected sight-threatening lesions which could not be visualised on conventional retinal imaging in nearly half of all patients, and detected additional lesions in over 90% of cases. This technology has the potential to increase the diagnostic capability both in community screening, clinical practice, and telemedicine, as well as standardisation of grading in research studies.

CR-83

Topical Imiquimod in the Treatment of Extramammary Paget's Disease – A 10-Year Retrospective Analysis in an Asian Tertiary Centre

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Background & Hypothesis:
Extramammary Paget's disease (EMPD) is a rare intra-epidermal neoplasm which can be limited to cutaneous involvement or associated with internal malignancy. Although surgery remains the standard therapy, it is associated with considerable morbidities and functional impairment. Topical imiquimod has been reported as a promising novel approach to the treatment of EMPD.

Methods:
A 10-year retrospective analysis was performed on all patients with EMPD treated with topical imiquimod 5% cream in National University Hospital (Singapore) from January 2005 to January 2015. Approval for this review was obtained from the national ethics review board.

Results:
Seven patients were treated with topical imiquimod. Topical imiquimod achieved partial remission (PR) in 4 of 7 lesions (57.14%) and complete remission (CR) in 3 of 7 lesions (42.86%). Commonly reported adverse effects were erythema, pain and swelling. All acute adverse effects resolved with temporary cessation of imiquimod application and the use of potassium permanganate compress and a topical corticosteroid cream.

Discussion & Conclusion:
Imiquimod provides an attractive option for elderly patients who are either unsuitable candidates for surgery or those who decline it. The intensity of imiquimod's effect is dose-dependent. However, close monitoring, adjustment of therapy frequency with rest periods are acceptable. In conclusion, we show that topical imiquimod 5% cream is a promising option in the treatment of EMPD.

CR-84

Indirect Desensitisation NBUVB Phototherapy in the Treatment of UVA-induced Solar Urticaria

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Background & Hypothesis:
Solar urticaria (SU) is a rare photodermatosis with significant impact on quality of life. Mild cases may be ameliorated with sun protection and antihistamines, but this is untenable in cases of greater severity. Photoprophylaxis with narrow band UVB (TL-01) phototherapy (NBUVB) in the treatment of SU has not been reported in an Asian context.

Methods:
-

Results:
Two male patients presented with urticarial plaques over upper and lower limbs, face and neck which were associated with sun exposure. A photo-provocation test confirmed the diagnosis of UVA-induced SU in both. One patient also had an urticarial reaction to visible light. Both patients were negative for the hot water bottle test, and the use of antihistamines and sunscreen only provided temporary, minimal relief. They were diagnosed with solar urticaria, and started on a NBUVB desensitisation regimen, 2-3 sessions per week. They completed 38 and 41 sessions over 1 year. Both experienced marked improvement with longer latent intervals of 30 min from 5 min for the first patient and 60 min from 20 min for the second patient. They continued weekly maintenance therapy thereafter.

Discussion & Conclusion:
The goal in photoprophylaxis is to increase the UV filtering properties of patients' skin whilst avoiding the activating spectrum. Several mechanisms have been proposed for the mechanism of skin "hardening" with NBUVB therapy: competitive occupation by altered photoallergen IgE-binding sites on skin mast cells or down-regulation of mast cells from UVB-induced immunomodulation. We describe the successful photoprophylaxis with UVB therapy to treat UVA-induced urticarial, a first in Asia.

CR-85

5-Year Retrospective Study of Topical Calcineurin Inhibitor Use in a Singaporean Tertiary Hospital

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Background & Hypothesis:
Topical calcineurin inhibitor (TCI) is an immunomodulatory agent which inhibits T-lymphocyte activation and production of pro-inflammatory cytokines. Although it was initially introduced for the treatment of atopic eczema, it has been reported to be beneficial in a variety of dermatological conditions.

Methods:
We conducted a 5-year retrospective study of all patients prescribed TCIs at the Dermatology Clinic, National University Hospital (NUHS) from 2011-2015.

Results:
A total of 235 patients were identified. The mean age was 21.4 years and 96 (40.9%) were males. TCI preparations prescribed were tacrolimus (0.1% and 0.03%) and pimecrolimus (1%). The average duration of prescription was 15.7 months. TCI was prescribed for atopic dermatitis in 168 (71.5%), vitiligo in 33 (14.0%), psoriasis in 12 (5.1%), seborrheic dermatitis in 9 (3.8%) and other conditions in 59 (25.1%). TCI was well tolerated; the majority reported no side effect (97.4%), 5 (2.1%) reported erythema and 1 (0.4%) reported pruritus. We found no relationship between TCI use and malignancy. When used concurrently with oral and/or topical corticosteroids, TCIs had a higher efficacy compared to TCI use alone ($P = 0.037$).

Discussion & Conclusion:
TCI was used in a range of dermatological conditions with generally high efficacy, with a favourable side effect profile. Its use may help reduce dependency on systemic corticosteroid and other immunosuppression and should be investigated further as a treatment option in off-label indications.

CR-86

Correlation of Lipid Parameters to Albuminuria in Patients with Diabetes

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Background & Hypothesis:
Hyperlipidaemia has been linked to albuminuria in patients with diabetes and albuminuria has been considered an early marker of cardiovascular disease. We looked at the association of various lipid markers (total cholesterol (TC), LDL-C, HDL-C, triglycerides (Tg), non-HDL-cholesterol and remnant cholesterol) with albuminuria in diabetes patients.

Methods:
In this retrospective study (DSRB Ref: 2013/00399), we analysed the records of 720 patients between January 2011 to March 2012 to collect demographics, BMI, HbA1c, glucose, lipid profile and presence of albuminuria. We used Chi-square test to compare categorical variables and student's t-test or Mann-Whitney Wilcoxon test for continuous variables as appropriate. Multivariate analysis was conducted with adjustment for HbA1c, smoking, age, gender, ethnicity and BMI. A two-tailed significance level of 0.05 was chosen for all tests. Statistical analysis was conducted using STATA 13.0 (College Station, TX).

Results:
Albuminuria was present in 38% (277/720) patients, more prevalent in males, and univariate analysis showed associations with higher age, BMI, systolic blood pressure, HbA1c and fasting glucose. Lipid profile subanalysis showed an association with lower HDL-C and higher Tg, non-HDL-cholesterol and remnant cholesterol ($P < 0.05$). Multivariate analysis showed an association with higher TC (OR: [95% CI]: 1.2 [1.02-1.42]; $P = 0.03$), Tg (OR: [95% CI]: 1.33 [1.1-1.6]; $P = 0.003$), non-HDL-cholesterol (OR [95% CI]: 1.31 [1.08-1.58]; $P = 0.005$) and remnant cholesterol (OR [95% CI]: 3.27 [1.78-6.01]; $P < 0.001$).

Discussion & Conclusion:
The non-traditional calculated lipid variables: non-HDL-cholesterol and remnant cholesterol correlates with albuminuria in diabetes patients. Additional focus on therapeutic goals for these variables should be placed in routine diabetes practice.

CR-87

Use of Cerebral Oximetry in Patients with Cerebral Vasospasm after Spontaneous Subarachnoid Haemorrhage

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Background & Hypothesis:
Delayed cerebral ischaemia (DCI) secondary to cerebral vasospasm occurs in 30% of patients after spontaneous SAH. Cerebral oximetry utilises near-infrared light to provide quantitative measurement of cortical oxygen saturation. This offers the advantage of real-time monitoring for vasospasm but its use in SAH is not well established.

Methods:
In this case series, we describe our experience of using cerebral oximetry in 3 patients with vasospasm after SAH.

Results:
Patient 1 developed DCI on Day 10 (D10) of SAH. Cerebral oximetry readings showed rapid improvement after initiation of treatment with subsequent improvement of GCS. Patient 2 developed DCI with a drop in GCS on D5. A few hours prior to diagnosis, cerebral oximetry already showed a decreasing trend, which improved after initiation of treatment. Patient 3's angiogram showed left MCA vasospasm on D10 but was treated conservatively as her GCS and cerebral oximetry readings were stable. However, cerebral oximetry showed a decreasing trend prior to a drop in motor power on D13 and cerebral angiogram confirmed vasospasm.

Discussion & Conclusion:
The above cases illustrated the correlation of cerebral oximetry with DCI and vasospasm. Cerebral oximetry decreased prior to diagnosis of DCI in the last 2 patients, suggesting a role in early detection of DCI. In addition, cerebral oximetry was able to differentiate between symptomatic and radiologic vasospasm in Patient 3. However, more work needs to be done to investigate how cerebral oximetry varies in patients with different sites of vasospasm as well as to establish the appropriate cutoff values for diagnosis of vasospasm.

CR-88

An 11-Year Single Centre Experience with Etanercept Use in the Treatment of Moderate-to-Severe Psoriasis

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Background & Hypothesis:
The incidence of psoriasis in Singapore presents a significant problem for both dermatologists and patients. Since their introduction, biologics have significantly improved patient outcomes. This study describes our clinical experience with the use of etanercept for the treatment of moderate-to-severe psoriasis at the National Skin Centre, Singapore.

Methods:
We conducted a retrospective analysis of patients started on etanercept from December 2004 to May 2016 at the National Skin Centre, Singapore. The primary measure of clinical response was 75% or greater improvement in percentage of affected body surface area (BSA) following 12 weeks of etanercept treatment.

Results:
A total of 23 patients, mean age of 46.7 years, with moderate-to-severe psoriasis were evaluated. Seven patients (30.4%) had concomitant psoriatic arthritis. Eight patients (34.8%) were treated with etanercept in combination with one other therapy (NB-UVB, methotrexate, acitretin, or cyclosporin). Eleven patients (47.8%) achieved 75% improvement in the percentage of body surface area affected by psoriasis after 12 weeks of etanercept therapy. Etanercept was generally well tolerated, with mild to moderate treatment-related adverse events reported in 4 patients (17.3%), consistent with previous clinical trials. No cases of tuberculosis or opportunistic infections were observed during the treatment period.

Discussion & Conclusion:
Our use of etanercept for the treatment of psoriasis showed rapid clinical reduction in disease severity in a substantial number of patients. To date, etanercept has demonstrated an excellent safety profile, and from our experience, can be safely combined with phototherapy or systemic agents in patients with plaque psoriasis not responding to adequately to these agents alone.

CR-89

Methyl Aminolevulinate-Red Light Photodynamic Therapy (MAL-PDT) versus Cryotherapy in the Treatment of Recalcitrant, Acral Viral Warts in an Asian Population – A Pilot Study

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Background & Hypothesis:
Recalcitrant acral warts (RAW) pose a significant therapeutic challenge. Photodynamic therapy (PDT) has emerged as an efficacious treatment modality for this but there is a paucity of evidence comparing PDT directly with traditional treatment modalities. This prospective, unblinded, pilot study aims to evaluate the efficacy of methyl aminolevulinate (MAL)-PDT in the treatment of RAW in our local population, while using cryotherapy as an internal control.

Methods:
Four patients with RAW were recruited from a specialist dermatology clinic. RAW are defined as lesions which persisted despite 7 or more cryotherapy sessions over 3 months. One acral wart on each subject was chosen and treated with MAL-PDT. Other acral warts were treated with cryotherapy weekly with 1 wart from the cryotherapy arm (comparable in terms of size and morphology) was selected as control. After Week 12, change in cross-sectional area, pain score associated with treatment and complications were recorded.

Results:
The average decrease in wart size for the MAL-PDT arm was 33.7%, compared to 19.2% in the cryotherapy arm. Analgesia was required more often in the MAL-PDT arm, although average pain score was similar. No complications occurred in either arm.

Discussion & Conclusion:
MAL-PDT appears to be more efficacious than cryotherapy in treating RAW in our local population. Further studies can be performed to verify our findings.

CR-90

Quality of Life and its Associated White Matter Abnormalities in Schizophrenia

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Background & Hypothesis:
No known study has examined the relationship between quality of life (QOL) and white matter (WM) structures. The aim of this study was to investigate the validity and underlying neurobiological substrates of QOL. It is hypothesised that the established 4-factor QOL model will be valid and various QOL domains will be associated with different WM abnormalities.

Methods:
Cross-sectional data of 148 participants with schizophrenia from the Institute of Mental Health was used. Participants were assessed on their levels of QOL using the abbreviated version of the Word Health Organization QOL (WHOQOL-BREF) and underwent diffusion tensor imaging scans. WM fractional anisotropy (FA) values were extracted from these images. Confirmatory factor analysis was utilised to examine the fit of the established WHOQOL-BREF model. Multivariate linear regression was used to examine the associations between QOL and FA values with age, gender, duration of illness, medication dosage and level of psychopathology as covariates.

Results:
The 4-factor model fitted the data well. Therefore, FA values were regressed on WHOQOL-BREF factor scores. Multivariate linear regression demonstrated main effects for physical health ($P = 0.048$) and environment ($P < 0.001$) domains. Lower physical health QOL scores were associated with higher FA scores in the right internal capsule and bilateral posterior corona radiata while lower environmental QOL scores were associated with lower FA scores in the WM tracts, particularly in the right posterior corona radiata.

Discussion & Conclusion:
The WHOQOL-BREF is valid in the local schizophrenia population. QOL is associated with a variety of brain connectivity abnormalities and is a potential clinical marker of underlying neural changes.

CR-91

Comparison of Ultra-Widefield Imaging and Standard Fluorescein Angiogram in the Assessment of Retinal Vein Occlusion

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Background & Hypothesis:
Retinal non-perfusion (RNP) from retinal vein occlusion (RVO) occurs over the macula and the peripheral retina. Ultra-widefield imaging is non-invasive and allows visualisation of more of the peripheral retina than standard imaging. We aimed to evaluate the extent of RNP not detected using standard imaging in RVO and the impact on clinical outcomes

Methods:
Ultra-widefield fluorescein angiogram (FA) images were obtained for 36 patients diagnosed with RVO using the Optos 200Tx and evaluated using a novel stereographic projection software. Standardised templates representing 7-standard field fundus photos were separately superimposed on the ultra-widefield images and manually graded. Visual acuity (VA) and central subfield thickness on optical coherence tomography (OCT) were assessed before and after treatment.

Results:
The area of RNP detected using ultra-widefield FA was 96.2% more than the area visible on standard-field images. Patients were grouped into small (n = 15), medium (n = 9) and large (n = 12) areas of peripheral RNP. On presentation, the mean VA was significantly better for eyes with small areas of peripheral RNP compared to those with medium and large peripheral RNP (LogMAR 0.4 vs 0.9 vs 0.85, $P = 0.026$). They maintained better VA after treatment (LogMAR 0.3, 0.6 and 0.7, $P = 0.043$). Large areas of peripheral RNP had greater OCT thickness at presentation compared to medium and small areas (530µm vs 481.7 µm vs 438.3 µm, respectively).

Discussion & Conclusion:
The extent of peripheral RNP on ultra-widefield FA, not visualised on conventional imaging, is associated with VA outcomes and OCT thickness on presentation and are of clinical value in prognosticating patients with RVO.

CR-92

Fatigue, Functional Outcomes and Airflow Obstruction in Adult Patients with Bronchiectasis

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Background & Hypothesis:
Bronchiectasis is a chronic inflammatory airway disease with significant morbidity and mortality. Fatigue is a complex, disabling symptom which can be measured objectively. Its relationship between quality of life, anxiety, depression, lower limb muscle strength and airflow obstruction is unclear. We aimed to study the associations of fatigue, functional outcomes and airflow obstruction.

Methods:
An exploratory study on consecutive patients attending the bronchiectasis clinic between April and September 2015. Demographics, sputum microbiology, body mass index (BMI), lung function tests, St George's Respiratory Questionnaire (SGRQ), 5 repetition sit-to-stand tests (5STS), Modified Medical Research Council dyspnoea score (MMRC) and breathless-cough-sputum score (BCSS), and Hospital Anxiety and Depression Score (HADS) were analysed. Fatigue was measured by Functional Assessment of Chronic Illness Therapy-Fatigue (FACIT-F) score.

Results:
A total of 25 patients with a median (IQR) age 69 (62.5-74.5) were studied. Median (IQR) predicted FEV1 was 64.5% (46-86.5); 17% of the patients had fatigue (FACIT-F <34), 8% had anxiety (HADS-A >8) and 12% had depression (HADS-D >8). Fatigue (FACIT-F) was correlated with HADS (anxiety and depression) (r = -0.661, P = 0.001; r = -0.596, P = 0.003). 5STS correlated with the number of ED attendances and hospital admissions (r = 0.604, P = 0.004; r = 0.734, P <0.0001 respectively). No correlations were found between fatigue, BMI, SGRQ, BCSS and predicted FEV1.

Discussion & Conclusion:
A significant number of patients with bronchiectasis suffered from fatigue, anxiety and depression. There was significant correlation between FACIT-F and HADS. The lower limb muscle strength (5STS) correlated with the ED attendances and hospital admissions. The usefulness of 5STS in predicting exacerbation of bronchiectasis will need further validation.

CR-93

Risk Factors, Causes and Management of Postural Hypotension in Home Care Patients of Tan Tock Seng Hospital

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Background & Hypothesis:
Home care is a rapidly growing service in many countries including Singapore, with an increasing and ageing population. A major cause for hospitalisation or emergency department visits for home care patients is postural hypotension (PH) and its associated symptoms, including falls. However, very few studies have been conducted for this common condition in home care patients. This study aims to find out the prevalence and associated risk factors for postural hypotension, and to assist home care physicians in the detection and management of postural hypotension in home care patients.

Methods:
A retrospective cross-sectional study was carried out on patients of Tan Tock Seng Hospital home care service (PACH) from 1 July to 31 September 2015. Data included age, gender, functional assessment, presence of chronic diseases or comorbidities, symptoms and severity of postural hypotension, as well as the management measures instituted.

Results:
A total of 130 patients (female: 78%, mean age: 85 years, SD: 6.25) were included in our study. Prevalence of PH was 11.5% (n = 15). Mean BP drop was 35.1 mmHg (systolic) and 8.1 mmHg (diastolic). Logistic regression showed that Parkinsonism, presence of anaemia, and MBI scores (P <0.05) were independent predictors for PH. Associated signs/symptoms included: giddiness (13.3%) and falls (46.7%). Of those diagnosed with PH, 6.7% (n = 1) had pharmacological and 73.3% (n = 11) had non-pharmacological treatment.

Discussion & Conclusion:
Parkinsonism, anaemia, and MBI scores were predictors for postural hypotension in home care patients in Singapore.

CR-94

Percutaneous Endoscopic Gastrostomy Replacement in the Emergency Department: A Local Experience and Review of Literature

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Background & Hypothesis:
Replacement of a percutaneous endoscopic gastrostomy (PEG) tube is a relative simple procedure. Rare complications include gastric perforation and peritonitis. It is traditionally performed by gastroenterologists. This paper attempts to demonstrate that emergency physicians (EPs) who are trained in PEG change can also perform this procedure safely.

Methods:
This was a retrospective case review of all patients presenting to the emergency department (ED) in the year 2015 for the replacement of a malfunctioning PEG tube. The procedure was performed by EPs who had undergone appropriate training and certification. The following variables were collected: 1) re-attendance after index visit; 2) reasons for re-attendance; 3) complications related to PEG change; 4) hospitalisation due to PEG change complications; and 5) death due to PEG change complications.

Results:
A total of 81 patients were included in the study. For all cases, PEG tube was changed by EPs. All were discharged during the index visit. Six patients (7.5%) re-attended ED after the index visit for complications arising from the PEG tube change; 5 patients (6.25%) re-attended for the problem of leakage around PEG site and 1 patient (1.25%) presented for the problem of dislodged PEG tube. No patients required hospitalisation and no patient died from complications of PEG tube.

Discussion & Conclusion:
EPs can perform PEG tube change in ED safely after appropriate training and certification. PEG tube in ED can reduce unnecessary hospital admissions.

CR-95

Physical Activity Profile of Young Singaporean Males who are Enlisting to Military National Service

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Background & Hypothesis:
Previous research conducted on adolescents from different countries demonstrated a relationship between healthy dietary habits and the time spent engaged in physical activity. However, few have studied the relationship of the physical activity using reproducible and validated instruments in a representative sample of Singaporean male adolescents prior to their military service.

Methods:
The recruited participants were enrolled into a 10-week, weekly physical training programme. Over the course of the programme, the participants reported to the study centre 3 times where their anthropometry and physical activity assessments were conducted. The height and weight were measured using calibrated weighing scale and stadiometer, respectively. Physical activity and the associated energy expenditures were assessed accelerometrically over 1 weekday and 1 weekend full-day period using a sensitive, non-invasive arm-worn device (Sensewear®, BodyMedia, PA, USA).

Results:
Thirty-one participants (age, mean ± standard deviation 19.8 ± 0.6 years) were recruited into our study. The physical activity level profile of the participants were not altered by the 10-week programme as the numbers of hours spent on each level of physical activity were not significantly changed. The participants spent significant longer periods of time engaging in sedentary (14.4 ± 4.8%) and moderate (3.6 ± 1.7%) activities compared to the vigorous (0.1 ± 0.2%) and very vigorous (0.1 ± 0.1%) ones. Nearly all participants did not engage in vigorous to very vigorous activities during the entire study period.

Discussion & Conclusion:
The 10-week fitness programme did not influence the physical activity profiles of the recruited adolescents.

CR-96

Cancer Caregivers' Burden and Associated Demographic Factors

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Background & Hypothesis:
Improved cancer survival due to medical advancements may be associated with increased caregiver burden. Despite multiple efforts to coordinate care and provide support, caregivers remain an under-served and under-recognised group. This study aimed to determine the burden of cancer care and the associated sociodemographic factors amongst a cohort of Singaporean family caregivers.

Methods:
Family caregivers (n = 118) of ambulatory cancer patients within 3 months of first diagnosis at a cancer centre, completed a sociodemographic questionnaire and the Zarit Burden Index (ZBI). Chi square and Fisher's exact tests were used in analysis. The study had ethics approval.

Results:
There were 50.5% males, median age 41 to 50 years. The majority had secondary or less education and the median monthly household income was 2 to 4 thousand dollars; 56.9% were spouses and 77.1% did not have a domestic helper; 58.7% of caregivers reported little or no burden (mean ZBI scores 18.84. Greater caregiving burden was associated with lower educational level ($P < 0.05$) and lower monthly household incomes ($P < 0.01$).

Discussion & Conclusion:
The early stage and lower level of illness severity in this study's ambulatory care recipients probably contributed to the low levels of caregiver burden found. However, studies have also shown that Asian cultural values of filial obligation cultivate an attitude towards responsibility that may contribute as well. The association of income and education with caregiving burden parallels findings in other Asian populations. Greater attention should be placed on identifying financial needs and providing healthcare information and support for caregivers.

CR-97

Risk of Stroke and Intracranial Haemorrhage in 1212 Chinese with Atrial Fibrillation in a Teaching Hospital in Singapore

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Background & Hypothesis:
Current risk schemes to predict as well as on the 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 1212 patients with non-valvular AF (age 68.3 ± 14 years, 56% females), 93% of patients had CHA2DS2-VASc scores ≥1, 270 patients (22%) did not receive antithrombotic therapy, 796 patients (64.7%) were taking aspirin, and 146 (12%) were taking warfarin. After mean follow-up of 7 years, 140 patients (52%) without antithrombotic therapy developed ischaemic strokes. Use of aspirin and warfarin were associated with a relative risk reduction of ischaemic stroke by 47% and 73%, respectively (P <0.05). The annual incidence of ICH in patients taking aspirin and warfarin was 0.50% per year and 0.69% per year (P = 0.15) respectively.

Discussion & Conclusion:
Chinese AF patients are at high risk for ischaemic stroke and with low uptake of antithrombotic therapy. The study showed clinical benefit favours the use of warfarin over aspirin or no therapy for stroke prevention in this group of patients, with no significant difference in the incidence of ICH between those taking aspirin or warfarin.

CR-98

The Safety of Bailout Stenting with Drug Eluting Stents after Paclitaxel-coated Balloon Angioplasty, a Singapore and Norwich Collaborative

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Background & Hypothesis:
The need for bailout stenting after a suboptimal paclitaxel-coated balloon (PCB) angioplasty result could be as high 28%, yet the optimal strategy in such situations is not known. We sought to compare the safety of bailout stenting with drug eluting stents (DES) compared to the more established combination of PCB with bare metal stents (BMS).

Methods:
We retrospectively evaluated all patients who had stents implanted due to a suboptimal PCB angioplasty result between January 2010 and April 2015. Endpoints analysed were major adverse cardiac events (MACE) defined as cardiovascular death, non-fatal myocardial infarction (MI) and target lesion revascularisation (TLR), as well as TIMI major and minor bleeding.

Results:
There were 52 patients in the PCB+BMS group and 24 patients in the PCB+DES group. There were more Caucasians in the PCB+DES group (54.2% vs 28.8%, $P = 0.03$). Baseline clinical characteristics were otherwise comparable with a high proportion of diabetics in both groups (50% vs 45.8%, $P = 0.74$). Size of BMS was comparable to DES (diameter 2.72 ± 0.50 mm vs 2.89 ± 0.56 mm, $P = 0.20$, length 25.22 ± 13.47 mm vs 28.08 ± 19.08 mm, $P = 0.47$). Outcomes were comparable at the end of 1 year (MACE 12.2% vs 9.5%, $P = 1.00$, TLR 6.1% vs 4.8%, $P = 1.00$, MI 0% vs 4.8%, $P = 0.30$). There was no stent thrombosis or major bleeding reported. Minor bleeding rates were similar (4.2% vs 4.8%, $P = 1.00$).

Discussion & Conclusion:
Our initial experience using DES instead of BMS to bailout suboptimal a PCB result appears to be safe and effective at 1-year.

CR-99

Multi-Centre Asian Data on Risk Factors for Non-Response to Cardiac Resynchronisation Therapy

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Background & Hypothesis:
Up to 30% of patients with heart failure do not respond to cardiac-resynchronisation-therapy (CRT). Guidelines specify clear inclusion criteria for CRT, but little is written to predict non-response. We hypothesised that patients with left ventricular ejection fraction (LVEF) <20%, left ventricular internal dimension in diastole (LVIDd) >7.5 cm represent a late stage of heart failure that may not respond to CRT. Prior literature has been conflicting regarding response to CRT in those with very long QRS duration (> 180ms).

Methods:
We retrospectively evaluated patients from 3 centres implanted with CRTD from 2006 to 2014 with the above characteristics. Clinical non-response was defined by no reduction in New York Heart Association (NYHA) class.

Results:
Available data from 118 patients were analysed, of these 47.1% were clinical non-responders. Comparison of non-response rates between patients with and without the above risk factors are as follows: LVEF <20%, yes (n = 40), no (n = 78), non-responder 19 (47.5%), 38 (48.7%) 0.90; LVIDd >7.5 cm, yes (n = 16), no (n = 94), Non-responder 9 (56.2%), 43 (45.7%) 0.59; QRS >180ms, yes (n = 15), no (n = 90), non-responder 3 (20.%), 51 (56.7%) 0.01; 2 or more risk factors, yes (n = 17), no (n = 101), non-responder 9 (52.9%), 48 (47.5%) 0.80.

Discussion & Conclusion:
There were no significant differences in terms of clinical response between those with or without dilated hearts >7.5 cm or EF <20%. However, our findings suggest that patients with a very wide QRS duration are more likely to respond to CRT in terms of functional class.

CR-100

Appropriate Management of Primary Insomnia in Outpatients at the Institute of Mental Health: A Clinical Audit of 31 Patients

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Background & Hypothesis:
This audit reviewed the management of primary insomnia in outpatients at the Institute of Mental Health (IMH), as compared to international standards published in the literature.

Methods:
An extensive review of the literature was performed and best practice recommendations were produced as the basis for comparison. Records, both the initial assessment and subsequent management plans for a period of 12 months, were reviewed for all outpatients diagnosed with primary insomnia at IMH in 2014.

Results:
Out of 31 patients, non-psychiatric factors such as other sleep disorders (7%) and medical causes (17%) were less often explored. Two patients (6%) were referred for cognitive behavioural therapy for Insomnia (CBT-I) at the first visit, while 12 (39%) either did not receive or have no documentation of receiving basic behavioural counselling. Most commonly used medications were hydroxyzine (39%), antidepressants (23%), hypnotics (19%) and in combinations (16%). Although hydroxyzine was the most commonly used medication, only 1 out of 12 (8%) patients reported improvement. Potential adverse side effects were either not explained or not documented in 22 patients (73%). Attempts to reduce the risk of dependence and tolerance were only considered in 57% of patients who were started on a hypnotic.

Discussion & Conclusion:
Findings suggest the need for more comprehensive assessment with extensive use of basic behavioural counselling and CBT-I, along with having a wider range of choices of pharmacotherapy for shared patient-clinician decision-making. All patients on hypnotics should be reviewed regularly for adverse effects with attempts to reduce the risks of tolerance/dependence with clear documentation.

CR-101

A Pilot Study Examining Predictors of Mortality in Advanced COPD – Importance of Age, Nutrition, Systemic Inflammation and Physical Performance Indices

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Background & Hypothesis:
There are major limitations to accurate prognostication in advanced COPD. We aim to compare the prognostic capabilities of functional, nutritional, physical performance and inflammatory indices, against disease-specific prognostic measures, including the BODE index which comprises: BMI, FEV1, Modified Medical Research Council dyspnoea scale (MMRC) and the 6-minute walk test (6MWT).

Methods:
Patients with stage 3 and 4 COPD were recruited. COPD severity was assessed using FEV1, BODE and the use of long-term oxygen therapy (LTOT). We evaluated nutrition using Subjective Global Assessment (SGA), weight, BMI and serum albumin. Function was assessed using Modified Barthel Index (MBI). Physical performance was measured using 6MWT and grip strength. Systemic inflammation was measured with C-reactive protein (CRP) level. Kaplan Meier survival analyses and Cox-proportional hazard regression were applied to identify predictors of survival.

Results:
Eighty-three subjects were followed up for a median duration of 749 days; 15.7% died, their median survival time was 391 days. Disease-specific markers including BODE, FEV1, exacerbation frequencies and ICU admissions did not predict survival. Age, LTOT, 6MWT, weight loss, SGA, albumin level, grip strength as well as MMRC scores predicted survival (all $P < 0.05$). Serum CRP level was near significance ($P = 0.05$). Using regression analysis, weight loss >5% over 6 months (HR 11.77, $P < 0.005$), MMRC ≥ 3 (HR 9.90, $P < 0.05$), age (HR 8.28, $P < 0.05$) and CRP >4.9 mg/L (HR 4.88, $P < 0.05$) predicted shorter survival independent of other covariates.

Discussion & Conclusion:
Age, nutrition, systemic inflammation and physical performance predict survival in advanced COPD, when disease-specific markers did not. A prognostic model incorporating these measures will improve predictive accuracies.

CR-102

Environmental Contamination of Patients Colonised with Extensively Drug-resistant *Acinetobacter baumannii*

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Background & Hypothesis:
In May 2015, a cluster of extensively drug-resistant (XDR) *Acinetobacter baumannii* (AB) was noted in the Medical Intensive Care Unit (MICU) at Tan Tock Seng Hospital (TTSH). A 1-day surveillance screening of the patients and their environment was undertaken in order to investigate this.

Methods:
Surveillance cultures were taken from all patients who had spent more than 24 hours in the MICU. Patients were screened using aspirates from endotracheal or tracheostomy tubes; nasal, axillary, groin and rectal swabs; swabs from exit sites of tubes, and drains and swabs from all wounds (if any). All equipment in patients' rooms were swabbed. Swabs were also taken from computers and equipment carts in the external environment.

Results:
There were 15 patients in the MICU on the day of screening. Eight were excluded from the screening as 5 were already known carriers of XDRAB and 3 were admitted for less than 24 hours. Thirty-four swabs were collected from the remaining 7 patients, 243 from patients' rooms and 11 from the external environment. Three patients were identified to be colonised with XDRAB. Twelve swabs from the patients' environment were positive for XDRAB, all of which were isolated from rooms with patients who were colonised or infected with XDRAB. All the swabs taken from door switches, sinks, faucet openings and external environment were negative.

Discussion & Conclusion:
This study demonstrates that environmental contamination of equipment in close proximity to the XDRAB carriers is common. Molecular studies are ongoing to assess the relatedness of the XDRAB isolates.

CR-103

An Abstinence and Safer Sex Intervention for Adolescents Attending the Public STI Clinic in Singapore

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Background & Hypothesis:
We aim to evaluate the efficacy of a comprehensive behavioural intervention to promote secondary abstinence and safer sexual behaviours among adolescents attending the public STI clinic in Singapore.

Methods:
Between November 2009 and December 2014, heterosexually active adolescents aged 16-19 years were recruited and randomly allocated to the intervention or control group. Intervention participants received 3 onsite personalised counselling and 2 online sessions over a 12-month period. Control participants received standard care. Surveys were administered at baseline, 6- and 12-month follow-ups to assess the impact of the intervention.

Results:
We followed up 187 (56%) of 337 adolescents in the intervention arm and 188 (54%) of 350 in the control arm at 12-month assessment. Over the 12-month follow-up, males in the intervention arm were more likely to report secondary abstinence in the past 6 months (males: 42% vs 24%; adjusted odds ratio [OR] 95% confidence interval [CI] 2.3 [1.4-3.8]); females: 21% vs 22%; aOR CI 1.0 (0.5-1.7), whereas females in the intervention reported higher consistent condom use for vaginal sex in the past 6 months (females: 37% vs 17%; OR [CI] 2.8 [1.5-5.0]; males: 35% vs 27%; OR [CI] 1.5 [0.7-2.9]). Overall, fewer adolescents in the intervention arm had incident STIs in the 6 months preceding follow-ups (8% vs 13%; OR [CI] 0.60 [0.34-1.03]). Intervention effects were observed for psychosocial mediators of STI-preventive behaviours.

Discussion & Conclusion:
A clinic-based comprehensive behavioural intervention for sexually active adolescents was able to promote secondary abstinence and safer sex behaviours and could be used to augment the current usual care.

CR-104

A Comparison of Bevacizumab and Ranibizumab for the Treatment of Neovascular Age-related Macular Degeneration

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Background & Hypothesis:
Age-related macular degeneration (AMD) is one of the leading causes of irreversible vision loss in the world. Monoclonal antibodies that inhibit vascular endothelial growth factor are widely used to treat neovascular AMD. However, debates on whether ranibizumab or bevacizumab is superior in treating AMD are still ongoing. The aim of this review is to examine the evidence (in terms of randomised controlled trials) for the clinical efficacy and safety of these medications.

Methods:
Using the keywords [ranibizumab or lucentis] and [bevacizumab or avastin] and [age-related macular degeneration or AMD or ARMD], a preliminary search on the PubMed database yielded 567 papers published in English between 1 January 2000 and 1 May 2015. Only clinical studies that met Level I (defined as well designed, randomised controlled trial) or Level II (defined as randomised clinical trials but with some shortcomings, e.g. unclear measure of outcomes, or short follow-up duration) evidence criteria were considered for review.

Results:
A total of 22 studies were included in this review. The meta-analysis showed that ranibizumab and bevacizumab have comparable clinical efficacy in terms of best corrected visual acuity ($P = 0.919$), and there are no significant differences between these medications in terms of mortality ($P = 0.831$) or atherothrombotic events ($P = 0.102$).

Discussion & Conclusion:
The current evidence suggests that overall, if a difference exists, it is likely to be small. However, the long-term effects of these medications remain unknown. Further studies are needed to determine if there is any increased risk of adverse event. Future work should also strive for a better fundamental understanding of the disease mechanism of AMD.

CR-105

A Review of the Use of Bupropion for Attention Deficit Hyperactivity Disorder (ADHD) in Children and Adolescents

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Background & Hypothesis:
Attention deficit hyperactivity disorder (ADHD) is one of the most prevalent neuropsychiatric disorders of childhood and adolescence. ADHD is associated with significant impairment in academic and social functioning. Stimulants are usually the first choice of drug, however, 2%-4% of children cannot tolerate stimulant medication because of severe side effects. Stimulants may also worsen comorbid mood and anxiety disorders and lead to problems of misuse and diversion. Bupropion is a promising non-stimulant alternative. This study will review published clinical trials on the subject.

Methods:
Using the keywords (bupropion or Wellbutrin or Zyban or Elontril) and (attention deficit hyperactivity disorder or ADHD or ADDH), a preliminary search on the PubMed database yielded 25,455 papers published in English between 1 January 1988 and 1 May 2016. Of these, there were only 6 clinical trials involving children.

Results:
Several open and controlled trials have shown bupropion's efficacy in improving ADHD symptoms. The pooled mean change in Iowa-Conner Abbreviated Questionnaire (ICQ) and ADHD Rating Scale-IV score for parents and teachers in child and adolescent ADHD in the bupropion- and methylphenidate-treated groups were not significantly different, with a standardised mean difference of 0.41 (95% CI, -0.92–0.11) and -0.10 (95% CI, -0.57–0.38) respectively. The pooled response rate for child and adolescent was also comparable between the 2 treatment groups, with a relative risk of 1.08 (95% CI, 0.85–1.38).

Discussion & Conclusion:
In general, amongst children with ADHD, bupropion appears to be less effective than stimulants, but more tolerable. It should be considered for use in the management of childhood ADHD.

CR-106

Adherence to Guidelines on Empiric Use of Antibiotics in the Emergency Department – A Quality Improvement Audit

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Background & Hypothesis:
The Antimicrobial Stewardship Programme (ASP) was launched in Tan Tock Seng Hospital in 2009. In 2012, the ASP was incorporated into the Emergency Department (ED) electronic clinical support system. The objectives were: 1) to evaluate ED doctors' adherence to ASP guidelines for pneumonia; and 2) to identify reasons for non-adherence.

Methods:
This was a retrospective case review between 24 to 30 June and 25 to 31 July, 2014. We recorded demographic data, patient acuity category, type of antibiotics given, grade of attending doctor, and reasons for non-adherence. Administration of one or more, but not all of the recommended antibiotics was defined as partial-adherence. Administration of none of the recommended antibiotics was defined as non-adherence.

Results:
We reviewed 289 cases; 99 (34.2%) cases had complete adherence; 153 (52.9%) cases had partial-adherence; 37 (12.8%) cases were non-adherent. For the cases of partial-adherence, 125 cases did not have documented reasons. The documented reasons for partial-adherence include: drug allergy (10); inability to tolerate orally (6); retreatment/ongoing antibiotic treatment (4); patient transferred to ward before completion of antibiotics (3); recommended antibiotic contraindicated (3); multiple sources of infection (1); and discharged against medical advice (1). For cases of non-adherence, 19 cases did not have documented reasons. Reasons for non-adherence include: drug allergy (10); antibiotic not indicated (4); pretreatment/ongoing antibiotic treatment (2); multiple sources of infection (1); and recommended antibiotics contraindicated (1).

Discussion & Conclusion:
Adherence to ASP guidelines in ED can be improved. Documentation is important when deviating from guidelines. Guidelines can be drawn for second-line antibiotics, if patient is allergic to first-line.

CR-107

Two-Year Outcomes of Reduced Fluence Photodynamic Therapy in the Treatment of Polypoidal Choroidal Vasculopathy

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Background & Hypothesis:
Standard-fluence verteporfin photodynamic therapy (PDT) is frequently employed in the management of polypoidal choroidal vasculopathy (PCV). However, optimal PDT protocol remains controversial. Some authors suggest that reduced-fluence PDT may have comparable efficacy while reducing complications. We aimed to compare the efficacy and safety between reduced-fluence and standard-fluence PDT.

Methods:
A review was conducted of all PDT-naïve patients diagnosed with PCV and treated with PDT (reduced or standard-fluence) from January 2011 to December 2013.

Results:
Thirty-seven eyes of 37 patients (24 males and 13 females) were included, with a mean age of 69.9 years (range, 50-89 years, SD ± 8.9). They were followed up for a mean duration of 22.5 months (range, 6-48 months). Of these, 29 (78.4%) were treated with standard-fluence PDT while 8 (21.6%) had reduced-fluence PDT. Overall, patients treated using reduced-fluence PDT had better visual acuity (VA) outcomes compared to standard-fluence PDT at 3-months (mean LogMAR 0.31 vs 0.59), 6-months (0.22 vs 0.56), 12-months (0.23 vs 0.48) and 24-months (0.40 vs 0.65). There was no difference between the groups when analysed with respect to the number of antivascular endothelial growth factor (VEGF) injections administered (5.6 vs 4.8) during follow-up. No statistical difference in recurrence of disease activity between the 2 groups (58.6% recurrence in standard-fluence group vs 37.5% in reduced-fluence group). No adverse events were reported in both groups.

Discussion & Conclusion:
Reduced-fluence PDT showed better 2-year VA outcomes while having comparable recurrence rates and number of anti-VEGF injections required, and may be beneficial to patients with PCV.

CR-108

A Minimally Invasive Approach Method of Treating Submacular Haemorrhage – Pneumatic Displacement Using Tissue Plasminogen Activator

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Background & Hypothesis:
Haemorrhage occurring directly under the macula (submacular haemorrhage) is a common sight-threatening complication of various retinal diseases. Standard surgical management carries a high risk of complications. We aimed to evaluate the safety and efficacy of a minimally invasive treatment of submacular haemorrhage using tissue plasminogen activator (tPA) and pneumatic displacement.

Methods:
In a 10-year cohort study of consecutive patients presenting with submacular haemorrhage, intravitreal injection of 0.05 ml tPA was adminstered, followed by pneumatic displacement using 0.3 ml perfluoropropane gas. Risk factors for long-term success and visual outcomes were assessed using multivariate analysis.

Results:
Among all 63 patients, single-treatment success rate was 89.3%. The mean duration of follow-up was 16.2 ± 1.4 months. Forty-seven patients (74.6%) had improvement or stablisation of visual acuity (VA). Of these, 35 (55.5%) achieved significant gains of $\geq$lines of vision following treatment. Factors associated with good visual outcomes included age $\leq$65 years ($P = 0.001$), absence of procedure-related complications ($P = 0.016$) and size of haemorrhage $\geq$30 mm² ($P = 0.01$).

Discussion & Conclusion:
Pneumatic displacement of submacular haemorrhage using tPA is a novel, minimally invasive technique with good visual outcomes. This is a useful option in managing patients with submacular hemorrhage compared to more complex and invasive surgical procedures.

CR-109

Association between Cybervictimisation and Suicidal Behaviours

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Background & Hypothesis:
Cyberspace has brought greater connectivity among people but has also introduced a unique set of issues such as cyberbullying. Research has shown an association between cybervictimisation and emotional problems including suicidal behaviours. As studies of this association were mainly conducted in western countries, we wanted to explore the following hypotheses within the Singapore context: 1) cybervictimisation is associated with higher emotional problems, and 2) higher incidence of self-harm, suicidal thoughts and suicidal attempts.

Methods:
A stratified sample comprising 3319 Singaporean school students aged between 12 to 17 years was used for the study. Cross-sectional data was gathered using the Strengths and Difficulties Questionnaire (SDQ), and other self-reports designed to collect information pertaining to cyberbullying, self-harm, suicidal thoughts and suicidal attempts. Multiple logistic regression analyses were conducted to examine the hypotheses.

Results:
A total of 7.3% of participants identified themselves as cybervictims, 4.8% as cyberbully-victims and 1.8% as cyberbullies. All 3 cyberbullying-involved groups were more likely to have emotional problems as compared to the not-involved group. They also reported significantly higher incidence of self-harm behaviours, suicidal thoughts and attempts as compared to the not-involved group, with lesser degree among cyberbullies.

Discussion & Conclusion:
Emotional problems and suicidal attempts were associated with cyberbullying and not limited only to cybervictims. Findings can be used to raise public awareness of the consequences of unhealthy cyberusage and aid in the early detection of cyberbullying among adolescents. The associations between cyberbullying and self-destructive behaviours suggest that cyberwellness programmes should be considered as a part of suicide prevention efforts in schools and in the community.

CR-110

What is the Prevalence of Newly Diagnosed Hyperglycaemia amongst Emergency Department Patients Presenting with Skin Abscesses? A Retrospective Cohort Study

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Background & Hypothesis:
Performing random capillary blood glucose (CBG) at triage for patients presenting with skin and soft tissue abscess is a routine practice at the emergency department (ED). However, the evidence behind such practice is uncertain.

Methods:
This is a retrospective cohort study. Patients with a diagnosis of skin or/and soft tissue abscess was included. Patients with pre-existing history of diabetes mellitus (DM) were excluded. Variables collected include: 1) age, 2) gender, 3) comorbidities, 4) number of comorbidities, 5) random CPG, and 6) site of infection. Basic statistics were used to calculate the prevalence and proportions.

Results:
Data was collected from 1 January to 30 June 2015. A total of 783 patients were included in the study; 37 patients (4.72%) were found to have raised CBG (>11 mmol/L) at triage. These patients were predominantly males (70.3%) and 83.8% were aged between 26-65 years old. Surprisingly, 70.3% of them have no known comorbidities. There were no patients aged 16-25 years old who had raised CBG.

Discussion & Conclusion:
Reinforcement of checking CBG for ED patients presenting with skin abscesses at triage is needed. However, it may be unnecessary to perform CBG for patients aged below 25 years old.

CR-111

Real World Practice: Glycaemic Control after Withdrawing Metformin in Adult Patients with Diabetes Mellitus

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Background & Hypothesis:
The use of metformin is restricted in chronic kidney disease and with worsening diabetic nephropathy, metformin should be stopped. However, there are neither adequate studies on glycaemic control after stopping metformin, nor guidelines on optimal agents for glycaemic control thereafter. This study aims to characterise the effect of metformin withdrawal on glycaemic control in adult patients with T2DM due to deteriorating renal function, and to describe the real world practice in maintaining glycaemic control upon stopping metformin. We hypothesise that Hba1c will increase by more than 1% after metformin withdrawal.

Methods:
This is a retrospective clinical study of patients with T2DM from the Diabetes Clinic from National University Hospital within the period of January 2012 to December 2015. One-hundred patients for whom metformin was withheld due to deteriorating renal function were recruited, and data on HbA1c change at 3 and 6 months after stopping the metformin was obtained via electronic records along with other relevant data.

Results:
The average HbA1c change increased by 0.422 ± 1.94 ($P = 0.030$) at 3 months and 0.545 ± 2.10 ($P = 0.009$) at 6 months. However, among those with HbA1c decrease of >1%, 41% had DPP4 inhibitors added (n = 13 out of 31),10% had sulfonylurea/metiglinides added, 6% had an increased dose of sulfonylurea/metiglinides, 6% had basal insulin added, 19% had premixed insulin added, 3% had basal-bolus regime added and 13% had an increased dose of premixed insulin.

Discussion & Conclusion:
Initiating DPP4 inhibitors in patients can be considered upon cessation of metformin in view of potentially improved glycaemic control over other therapies.

CR-112

A Novel Anti-IL 17A Therapy in Treatment of Moderate to Severe Psoriasis in Singapore

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Background & Hypothesis:
Secukinumab is a human monoclonal antibody that binds to interleukin (IL)-17A used for treatment of moderate to severe psoriasis following FDA approval in January 2015. We assess the safety and efficacy of patients who were prescribed secukinumab at the National Skin Centre, Singapore.

Methods:
This is a retrospective study including adults with plaque psoriasis who were prescribed secukinumab between June 2015 and May 2016 at the National Skin Centre, Singapore. Efficacy was assessed by calculating the proportion of patients who achieved 75% improvement in body surface area (BSA) involvement at 3-month follow-up. Significant adverse events were documented.

Results:
A total of 13 patients with moderate to severe psoriasis were included in the study. Mean age was 44 years. Three (23%) patients had psoriatic arthritis; 69% (9) of patients had refractory psoriasis failing treatment with at least 2 biologics prior to the administration of secukinumab. With regards to efficacy, 54% (7) of patients achieved 75% improvement in BSA at 3 months. Mean time to achievement of 75% improvement in BSA was 1.7 months. Two patients in the group had treated latent tuberculosis (TB). There were no reported cases of TB reactivation during the study period. No incidence of nasopharyngitis, mucocutaneous candidal infection or inflammatory bowel disease was reported.

Discussion & Conclusion:
This is a preliminary study which demonstrates safety and efficacy of secukinumab in the treatment of refractory psoriasis. Significant improvement was also observed early following the administration of secukinumab.

CR-113

Bullous Pemphigoid and Antecedent Neurological Diseases: Association with Dementia and Non-Association with BP180 and BP230 Antibodies

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Background & Hypothesis:
Bullous pemphigoid (BP) is the most common subepidermal immunobullous disorder. Some studies have variably reported BP and associations with different neurological diseases (ND). We aimed to evaluate if BP and consequently BP180 and/or BP230 antibodies are associated with pre-existent ND.

Methods:
All dermatology inpatient consults from January 2010 to February 2016 were analysed. BP cases were identified based on dermatological features, consistent histology and direct immunofluorescence findings. Patients with other autoimmune bullous skin conditions were excluded. Inpatients with other skin conditions were randomly selected as controls and age- and gender-matched to BP cases in a 1:1 ratio.

Results:
Out of 3468 inpatients, 103 BP cases and 103 matched-controls were included. After adjusting for age, gender, race, functional status and neuro-psychiatric medications, BP cases were found to be thrice more likely to have a history of at least 1 ND (OR: 2.88; 95% CI: 1.32-6.26; $P = 0.008$). Amongst the pre-existing ND, only dementia was statistically more prevalent in BP cases compared to controls (adjusted OR: 2.61; 95% CI: 1.19-5.75; $P = 0.017$); Parkinson disease and psychiatric disorders demonstrated a non-statistically significant higher adjusted risk. BP cases with BP180 antibodies had lower risk of antecedent ND, while BP230 antibodies positivity showed higher risks; these were non-statistically significant.

Discussion & Conclusion:
Pre-existent ND, specifically dementia, was found to be associated with BP occurrence in our cohort. No association between BP180 or BP230 in BP patients and ND was found. This knowledge can aid in early BP recognition, whereby features may be non-specific and early intervention can significantly reduce morbidity.

CR-114

A Case Series of Surgically Treated Rotational Ankle Fractures

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Background & Hypothesis:
There is a dearth of information on local patterns of rotational ankle fractures. There is no published study that looks at injury patterns in rotational ankle fractures occurring in Singapore.

Methods:
This paper serves as a starting point to look at the incidence of local fracture patterns according to the Lauge Hansen classification. This retrospective case series looked at surgical fixation of rotational ankle fractures over a 6-month period. Plain radiographs of the injured ankles were analysed. This was used to determine fracture classification data. The presence of tibiotalar fracture dislocation and syndesmotic injury was also examined.

Results:
A total of 45 cases were studied over the 6-month period. The most common cause was a fall from standing height (53.3%). The rest were from sports injuries (17.8%), road traffic accidents (15.6%), fall from height (11.1%) and industrial accidents (2.2%). Supination external rotation (SER) fractures were the most common fracture type (62%). The incidence of syndesmotic injury was 31%. There was no association between syndesmotic injuries and ankle fracture dislocation. There was a significant absence of syndesmotic injuries among the SER stage 4 fractures ($P = 0.027$).

Discussion & Conclusion:
Rotational ankle fractures most commonly result from a fall from standing height and SER ankle fractures account for the majority of surgically treated ankle fractures. Syndesmotic injury occurred in 31% of all surgically treated ankle fractures. There was a significant absence of syndesmotic injury among the SER stage 4 fractures in our series.

CR-115

Walking after a Traumatic Spinal Cord Injury: Retrospective Study Conducted in an Inpatient Rehabilitation Centre in Singapore

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Background & Hypothesis:
This study was conducted to understand the epidemiologic characteristics of patients with traumatic spinal cord injury (SCI) in Singapore, identify factors that correlate with walking on discharge and FIM motor score gain, with the ultimate intent of finding intervenable points to prevent and improve outcomes in SCI.

Methods:
A retrospective records review of 122 traumatic SCI patients admitted to Tan Tock Seng Hospital (TTSH) rehabilitation centre from January 2010 to December 2013 was conducted.

Results:
A total of 68.9% were tetraplegics and 27% were AIS grades A/B. Mean age was 49.6 ($\pm$19.4) years with 81.1% males. The most common cause of injury was falls on level ground (39.3%). AIS grades C/D vs A/B (OR 54, P = 0.001), higher admission FIM motor scores (OR 1.069, P = 0.018) and higher discharge FIM motor scores (OR 1.113, P = 0.005) were significantly associated with walking on discharge. Older age (OR -0.233, P = 0.041), presence of caregiver (OR -0.197, P = 0.030) and delay in rehabilitation (OR -0.207, P = 0.043) were negatively associated with FIM motor score gains.

Discussion & Conclusion:
Patients with traumatic SCI were older and commonly sustained their injuries by falling on level ground, indicating a need to focus on fall prevention in the elderly. While factors correlated with walking on discharge were mostly non-modifiable, they may be used to guide clinical decisions for rehabilitation admission and intensity. Given the negative impact of delay in rehabilitation on FIM motor gain, it may be important to understand and minimise the causes of such delays, to improve functional outcomes in these patients.

CR-116

Attitudes of General Practitioners towards Healthcare of Patients with Intellectual Disability in the Community: A Study from Singapore

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Background & Hypothesis:
Worldwide, approximately 1 to 3% of population suffers from intellectual disability (ID) and they have higher of risk of physical and mental morbidity and experience poorer quality of healthcare compared to the general population. This study aimed exploring general practitioners' (GPs') attitudes and clinical experience with regard to assessment and management of patients with ID living in Singapore.

Methods:
Method involved an anonymised survey of GPs working in Singapore using a questionnaire developed specifically for this study. Overall, questionnaires were sent to a sample of 272 GPs.

Results:
Forty-nine out of the 272 questionnaires were returned. Respondents of this survey were predominantly male GPs working in "solo" practices. For the majority of GPs, the proportion of patients with ID constituted 1 to 5% of overall patient population. Nearly 90% of GPs identified problems in communicating with patients with ID as an important factor that significantly affected quality of assessment and treatment of their health conditions. Other barriers to assessment identified were behavioural issues and sensory impairments of patients with ID. Only one-third of GPs were confident that they had sufficient knowledge in the physical and mental health conditions of patients with ID. Three-fourths of GPs in our survey believed that training on health conditions related to ID would be beneficial for all GPs.

Discussion & Conclusion:
This study highlights the barriers GPs face with regard to assessment and management of people with ID. Appropriate interventions to address these barriers may improve the standard of healthcare provided to this group of population.

CR-117

Prevalence and Risk of Bleeding Associated with the Use of Selective Serotonin Reuptake Inhibitors in Hospitalised Elderly

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Background & Hypothesis:
Depression is the most common psychiatric disorder in the elderly. Selective serotonin reuptake inhibitor (SSRI) is the preferred treatment due to better safety profile. Some studies had reported a 2-fold greater bleeding risk in elderly SSRI users. Despite safety concerns, no local study had examined the SSRI-associated bleeding risk in our elderly. We aimed to examine SSRI-associated bleeding risk and identify possible risk factors for increased bleeding in hospitalised elderly patients.

Methods:
This retrospective cohort study included patients aged ≥65 years admitted under General Surgery between June and August 2015. Patients on antithrombotics, oral NSAIDs, long-term steroids, or those with primary bleeding disorders were excluded. Bleeding risk on admission and perioperatively were compared between SSRI and non-SSRI users using Fisher's exact and Mann-Whitney U tests. Multiple logistic regression was used to determine risk factors for bleeding.

Results:
A total of 200 cases (SSRI: n = 10; non-SSRI: n = 190) were included among 557 cases screened. Mean age was higher in SSRI users (84.8 ± 11.0 vs 76.3 ± 8.4 years; *P* = 0.008). Among all cases, 49 (24.5%) bleeding events were reported. There were no significant differences in bleeding prevalence and risk (30.0% vs 24.2%; RR 1.24), transfusion requirements, haemoglobin reduction and mean surgical blood loss between SSRI and non-SSRI users. Chronic kidney disease was identified as a risk factor for bleeding in general (adjusted OR 2.35; *P* = 0.027).

Discussion & Conclusion:
SSRI use did not appear to be significantly associated with increased spontaneous and perioperative bleeding in hospitalised elderly patients. Larger prospective studies could further stratify bleed risk by age to guide SSRI use in the elderly.

CR-118

Analysis and Outcome of 80 Patients with Herpetic Anterior Uveitis at a Tertiary Referral Eye Care Centre in Singapore

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Background & Hypothesis:
Herpetic uveitis is a common cause of anterior uveitis (AU). We investigated the epidemiology, clinical features and treatment outcome of herpetic AU in an Asian population.

Methods:
This is a retrospective observational study of Asians between 2005-2014 at a Singapore tertiary referral eye centre. Patients with clinically diagnosed herpes simplex (HSV) and varicella zoster virus (VZV) AU were included. The patients' data collected were age, gender, race, presenting visual acuity (VA) and at last follow-up, presenting symptoms and signs, anterior chamber (AC) tap results, treatment regime and recurrences, if any.

Results:
A total of 80 patients were included. The mean age was 56.8 ± 16.3 (11-93) years. The commonest presenting symptoms were eye redness, pain and blurring of vision. Mean presenting VA (Snellen logMAR) was 0.39 and improved by last follow-up to 0.21 ($P <0.001$). The commonest presenting signs were AC inflammation in all patients (graded by SUN classification), followed by keratic precipitates (82.5%) and stromal oedema (33.75%); 56.2% of patients had AC reaction of 2+ and above; 30 cases were HSV and 50 were VZV related; 27.5% of patients had an AC tap; 7.5% was HSV-positive and 1.25% was VZV-positive. Complications included raised intraocular pressure (31.25%) and corneal scarring (26.25%); 91.3% patients had oral acyclovir, 65.8% had acyclovir ointment and 11.2% had oral prednisolone with significant heterogeneity in duration of treatment.

Discussion & Conclusion:
In our study, herpetic AU patients commonly present with eye redness and AC inflammation. We found significant heterogeneity in treatment regime. Almost half the patients had recurrence warranting prolonged therapy with oral acyclovir.

CR-119

Clinical Predictors of Outcomes of Patients with Non-Cystic Fibrosis Bronchiectasis over a 4-Year Period

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Background & Hypothesis:
Non-cystic fibrosis bronchiectasis imposes a significant burden on patients and healthcare services. It is therefore important to identify factors associated with clinical declines and initiate aggressive treatment to reduce the risk of death. Charlson age-adjusted comorbidity index (CACI) is a validated index for the evaluation of comorbidities. We aimed to study the predictive value of CACI on outcomes of patients with bronchiectasis.

Methods:
We assessed demographic, pulmonary function, length of hospital stay, sputum microbiome, comorbid burden, readmission rate, and mortality data for all adult patients hospitalised with an exacerbation of bronchiectasis in 2011, and followed up through 2015. The CACI was evaluated and correlated with the time-to-readmission and mortality.

Results:
A total of 189 patients were studied; 38% and 62% survived during the study period. Patients who died were significantly older, had lower median percent predicted FEV1, lower BMI, and used LTOT, compared to survivors. No differences were detected for sputum prevalence of *Pseudomonas aeruginosa*. NTM was more common in survivors. Patients who died had a higher CACI compared to those who survived. The mortality for patients with higher (≥4) compared to lower (≤1) CACI trended toward significance.

Discussion & Conclusion:
CACI has good predictive value for 4-year mortality in patients with bronchiectasis. BMI and lung function were significantly reduced in non-survivors. Interestingly, NTM (being common in surviving patients) did not contribute to mortality. The clinical impact of NTM on bronchiectasis morbidity and mortality requires larger cohort studies to better elucidate mechanisms.

CR-120

Prevalence and Implications of an Equivocal Human Epidermal Growth Factor Receptor (HER)-2 Result in Breast Cancer

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Background & Hypothesis:
Human epidermal growth factor receptor (HER)-2 gene identifies patients for trastuzumab (Herceptin) treatment. Immunohistochemistry (IHC) is the first-line test used and fluorescent in-situ hybridisation (FISH) is used when IHC returns an equivocal result. We aim to evaluate the outcome of FISH testing and how an equivocal FISH result influences management.

Methods:
A retrospective review of 2505 women diagnosed with invasive cancer from 2006 to 2014 was performed.

Results:
Overall, HER2-positive tumours were more common in Malays, those with invasive ductal cancers, high-grade tumours, nodal involvement and in oestrogen receptor (ER) and progesterone receptor (PR)-negative tumours (P <0.05). On IHC testing, 515 (23%) patients had a positive result. An equivocal IHC result occurred in 562 patients (25%); of these, 509 patients had FISH done. On FISH testing, 72 (14%) had a positive result and 26 (5%) had an equivocal result still. Tumours that were larger (P = 0.02) and of a higher grade (P = 0.01) were more likely to return with an equivocal FISH result (P >0.01). Of the 26 patients with an equivocal FISH result, 7 had a repeat FISH and 3 were found positive and 2 were found negative. An equivocal result was again encountered in 2 patients; 1 subsequently received Herceptin while the other declined. Nineteen patients declined a repeat FISH test and 4 of these were treated with Herceptin.

Discussion & Conclusion:
An equivocal FISH test is uncommon and shows a positive correlation with tumour size and grade.

CR-121

HPV-Positive Oropharyngeal Cancer, an Impending Epidemic in Singapore?

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Background & Hypothesis:
HPV-related oropharyngeal SCC (OPSCC) is on the increase globally. In the United States, the prevalence of HPV-positive-related OPSCC increased from 20.9% in the pre-1990 time period to 65.4% from 2000-2014. Up till now, the rates in Singapore have been relatively unknown. We predict an uprising trend of HPV-positive-related OPSCC in Singapore, and aim to bring into consideration further analysis of this potential burgeoning problem.

Methods:
We looked at our series at TTSH from January 2015 to March 2016 and analysed the prevalence of HPV-positive OPSCC and its subsites – tonsils, base of tongue, soft palate and pharynx.

Results:
Twenty-two patients were analysed over this period. In 2 of the cases, the HPV status was unknown. Of the remaining 20 cases, 7 were positive for p16, a marker of HPV-related OPSCC (35%). If only the tonsil and tongue base oropharyngeal subsites were analysed, this rate was 50%.

Discussion & Conclusion:
Although the rates in Singapore remain relatively low compared to other countries, we are beginning to see a proportion of OPSCC patients that are HPV-related. With evidence suggesting the rise of risk factors locally, such as sexual practices, and possibility of racial and genetic difference in how this disease affects a population, it is imperative to study the epidemiology and trends of the disease. The Ministry of Health and Health Promotion Board should be made aware, and public school education should be considered as primary prevention. Pending analysis of trends, HPV vaccination in boys and girls should also be considered.

CR-122

Proximal Femur Anatomy in the South East Asian Chinese Population

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Background & Hypothesis:
Based on clinical experience, the proximal femur anatomy of the South East Asian Chinese population differs from that of other populations. The aim of our study was to measure the morphology of the proximal femur in the South East Asian Chinese population with hip fractures and to study gender- and age-related differences within this population

Methods:
We conducted a retrospective review of standardised anteroposterior pelvic radiographs of 65 male and 235 female hip fracture patients aged 60-90 years old with neck of femur fractures and who underwent hip bipolar hemi-arthroplasties. Morphological dimensions were measured using electronic radiographic software and calibrated using hip hemi-arthroplasty shells of known sizes. Femoral head diameters, medial offsets, vertical offsets and neck shaft angles were measured. Comparisons were made between male and female patients as well as patients between 60-75 and 76-90 age groups.

Results:
Male subjects have a significantly greater femoral head diameters, medial offsets and vertical offsets. Older patients have significantly smaller femoral head diameters, vertical offsets and neck shaft angles.

Discussion & Conclusion:
We have quantified the proximal femur morphology in the South East Asian Chinese hip fracture population and showed gender- and age-related morphological differences within this population. Based on our clinical experience and current literature, the study can be extended by comparing our results with other populations as well as comparing the proximal femur morphology to that of commonly used femoral stem implants.

CR-123

Adult Acne in a Multiracial Asian Population

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Background & Hypothesis:
Acne vulgaris affects up to 80% of adolescents. However, the prevalence of adult acne is less established. Adult acne in women has been well studied but data on adult acne in men is lacking. Acne can cause a profound impact on a patient's quality of life with significant morbidity. In the present study, we look at the clinical characteristics and psychosocial impact of adult acne in an Asian population and how acne features may differ between males and females.

Methods:
A survey form was administered to patients during routine clinic consults. Patients with acne aged above 25 years were invited to participate in the survey. Data was collected on the patients' demographics, relevant medical history, acne grade, scarring grade and treatment received. Psychosocial impact was measured using the Dermatology Life Quality Index (DLQI), Cardiff Acne Disability Index (CADI) and Acne-specific Quality of Life Questionnaire (Acne-QoL).

Results:
Seventy-nine patients (30 males) completed the survey. The predominant area affected in both sexes was the cheeks; 49% of females and 20% of males had comedonal lesions around the mandible (P <0.01). Females scored higher on the CADI compared with males (mean 6.5 vs 4.9, P <0.01). There was no statistically significant difference in the treatments received prior to consultation between males and females.

Discussion & Conclusion:
There is no difference in facial acne distribution between males and females. Females are more likely to have comedonal lesions around the mandible. The psychosocial impact of acne appears to be greater in females than in males.

CR-124

A Comparative Study of the Effect of Atracurium versus Pancuronium on Endotracheal Intubation in the Myanmar Population

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Background & Hypothesis:
This study was designed to compare the effect of atracurium versus pancuronium on intubating conditions and cardiovascular parameters in the Myanmar population.

Methods:
A randomised, prospective, comparative, clinical study of 60 patients (30 for atracurium and 30 for pancuronium), aged between 20-50 years with ASA I and II who underwent elective surgery was conducted. After induction with propofol 2.5 mg kg-1, 30 patients in group A were given atracurium 0.5 mg kg-1 and 30 patients in group B received pancuronium 0.1 mg kg-1. The first intubation attempt was made after 3 minutes of injection in both groups. The heart rate and SpO2 changes were recorded every minute and blood pressure changes for every 3 minute from just before injection of neuromuscular blocking agents till 12 minutes. Intubation conditions were assessed as described below.

Results:
Atracurium provided more jaw relaxations ($P = 0.026$), better laryngoscopic view ($P = 0.028$), better vocal cord paralysis and better diaphragmatic relaxation ($P = 0.038$) and better intubating grading ($P = 0.028$) than pancuronium. It was concluded that atracurium provided better intubating conditions than pancuronium. Atracurium caused a slight fall in blood pressure from the baseline but it was not statistically significant. Atracurium had lacked hypertensive response to intubation and provided better haemodynamic stability than pancuronium. Pancuronium caused rapid increase and decrease in blood pressure and had hypertensive stress response to intubation at 6 minutes, which was statistically significant ($P < 0.05$). Pancuronium caused significant increase in heart rate than atracurium and was statistically significant at every minute.

Discussion & Conclusion:
Atracurium provided better intubating condition and haemodynamic stability than pancuronium.

CR-125

Improving Patient Outcomes – Early Discharge following Robotic Surgery for Thymic Masses

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Background & Hypothesis:
Resection of thymic masses is traditionally performed via median sternotomy. Recent reports of robotic thymic mass resection have described good outcomes. This study aims to evaluate whether robotic surgery results in a shorter postoperative hospital stay, compared to open surgery.

Methods:
We conducted a retrospective study of all patients with thymic masses who underwent open or robotic resection from January 2000 to December 2015. Data collected included patient demographics, operative times, length of stay in the intensive care unit (ICU), hospital stay, morbidity and early mortality.

Results:
Sixty-nine patients were eligible for this study, and 38 were females. Median sternotomy was performed in 24 patients, and robotic surgery was performed in 45 patients. Median age was 52 years for open surgery, and 54 years for robotic ($P = 0.67$) Median operative time was 105 minutes for open surgery and 99 minutes for robotic ($P = 0.08$). One patient required conversion to open surgery due to concerns of great vessel involvement. Postoperative complications occurred in 4 patients who underwent open surgery: pneumothorax (n = 1), reopening for bleeding (n = 1), and myasthenic crisis (n = 2). One patient in the robotic group developed atrial fibrillation ($P = 0.046$). Median ICU stay was 1 day following open surgery and zero days for robotic surgery. Median hospital stay was 5 days for open surgery and 2 days for robotic surgery ($P = 0.002$). There was no early mortality in both groups.

Discussion & Conclusion:
Our study demonstrates that robotic surgery for thymic mass resection results in a shorter length of stay compared to open surgery.

CR-126

The Oxford-MEST Score Does Not Improve Risk Prediction in IgA Nephropathy

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Background & Hypothesis:
The long-term outcome of IgA nephropathy (IgAN) is highly variable and baseline clinical parameters predict long-term renal outcome. The Oxford-MEST score is independently associated with adverse renal outcomes, but it is unclear if the addition of Oxford-MEST score to baseline clinical parameters improves risk prediction. We hypothesise that the combination of clinical parameters and MEST scores improves prediction of renal outcomes.

Methods:
We conducted a single-centre, retrospective analysis of patients with biopsy-proven primary IgAN during 2010-2015. We used prediction models to analyse the probability of composite primary outcomes of 50% decrease in estimated glomerular filtration rate (eGFR) or end stage renal disease using baseline clinical parameters (mean arterial pressure, proteinuria, eGFR), MEST scores or a combination of both. Differences between observed and predicted event rate (calibration) and improvement in model performance (discrimination) were analysed.

Results:
Seventy-seven patients were included. At biopsy, mean age was 43.9 ± 15.7 years, mean eGFR was 61.4 ± 29.2 ml/min/1.73 m^2 and median proteinuria 2.5 (1.5, 3.1) g/d. Both clinical data and the addition of MEST score showed similar calibration. However, the addition of MEST score to clinical data did not improve predictive value of poor renal outcomes, as C-statistic decreased from 0.83 [95%-confidence interval (CI) 0.67, 0.99] to 0.79 [95%-CI 0.60, 0.97] with cNRI -0.35 ($P = 0.66$) and IDI-0.09 ($P = 0.37$). There was significant interaction between clinical parameters and MEST score.

Discussion & Conclusion:
In our study, clinical parameters alone showed good predictive value for renal outcomes, but the addition of MEST score did not improve risk prediction. Our study demonstrates that clinical data alone is sufficient for risk prediction of IgAN.

CR-127

An Institutional Retrospective Review on High Risk Factors Associated with Mortality in Cases of Infective Endocarditis in a 30-Month Period

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Background & Hypothesis:
Infective endocarditis (IE) can lead to severe morbidity and mortality. We aimed to identify those patients at higher risk of mortality.

Methods:
We reviewed patients diagnosed with vegetations in the echocardiogram database over a 30-month period (January 2014 to June 2016). Risk factors associated with higher mortality were identified.

Results:
Forty-four cases of IE occurred during the 30-month period. One-year all-cause mortality rate was 30%. Median age for mortality cases was 65 years while those who survived was 58 years. End stage renal disease (ESRD) was associated with higher risk of demise (OR: 5.4; 95% CI, 1.2-23; *P* = 0.02), especially those with permcath access (OR: 4.3; 95% CI, 0.8-21.6; *P* = 0.05). Abnormal valves, including MVP and prosthetic valves also had higher risk (OR: 4.2; 95% CI, 1.03-17; *P* = 0.04). *Staphylococcus aureus* bacteraemia, both MSSA and MRSA (OR: 6.3; 95% CI, 1.6-25; *P* = 0.0085) portends a significant risk. Diabetes (OR: 1.2), prior IE (OR: 2.1), cardiogenic shock (OR: 2.5), heart failure (OR: 2.5), right atrial wall involvement (OR: 1.8) and mechanical complications (OR: 1.45) were associated with poorer outcomes, though not statistically significant. No interaction was found amongst valvular abnormalities and vegetations. Surgical intervention, if performed when indicated significantly led to lower mortality (OR: 0.067; 95% CI, 0.008-0.58; *P* = 0.014).

Discussion & Conclusion:
IE led to death in one-third cases. We identified older and ESRD patients, those with permcath, abnormal valves especially prosthetic ones, *Staphylococcus aureus* infections as risk factors for death in these patients. Surgical intervention significantly improved survivial.

CR-128

Evaluating the Utility of Procalcitonin in Guiding De-escalation/Cessation of Piperacillin-Tazobactam for Treatment of Uncomplicated Hospital-acquired Pneumonia

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Background & Hypothesis:
Procalcitonin (PCT) is an inflammatory biomarker that is increasingly utilised to guide antibiotic duration. However, we believe that de-escalation or cessation of antibiotics can be based on clinical improvement alone. This study aims to evaluate the difference in outcomes between patients with uncomplicated hospital-acquired pneumonia (HAP) whose antibiotics were de-escalated with PCT measurements versus those without.

Methods:
The retrospective cohort study included 68 patients treated with PTZ for uncomplicated HAP from January to February 2015. Demographic, clinical, laboratory and outcome data were collected. Primary outcome was 7-day re-escalation of broad-spectrum antibiotics after de-escalation of PTZ. Secondary outcomes included total duration of antibiotics, length of hospitalisation, 14- and 30-day mortality.

Results:
At initiation of PTZ, 35 out of 68 (51.5%) patients had PCT taken. But only 7 out of 68 (10.3%) patients had PCT measurements taken prior to de-escalation of PTZ. Both groups had similar characteristics at de-escalation. There was no difference in proportion who had re-escalation of antibiotics: 42.9% (3 out of 7) versus 14.8% (9 out of 61), $P = 0.1$. The total antibiotics duration, length of stay and mortality for both groups were similar.

Discussion & Conclusion:
Our results found that the usage of PCT guided de-escalation for uncomplicated HAP is low. However, data is lacking on the usage patterns of PCT in other sites of infection. Future studies can potentially explore utility of PCT in other infection sites.

CR-129

Comparison of Monopolar versus Segmental Radiofrequency Ablation in Endovenous Treatment of Lower Limb Chronic Venous Insufficiency

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Background & Hypothesis:
We aimed to compare outcomes in patients with lower limb chronic venous insufficiency (CVI) treated with monopolar (EVRF®, F Care Systems, Belgium) versus segmental (VNUS® ClosureFast™, Medtronic, USA) radiofrequency ablation (RFA) therapy.

Methods:
A retrospective study of 288 limbs treated between January 2014 to May 2015 was conducted. Demographics, comorbidities, CEAP classification, preoperative venous duplex, surgical procedure and postoperative outcomes were evaluated.

Results:
A total of 189 patients with 288 limbs were treated with RFA; 146 limbs were treated with EVRF and 142 limbs with VNUS. Both groups were similar in demographics and comorbidities. Average age was 58 years, with average BMI of 26. There were no patients with mixed arterio-venous disease. Majority had long saphenous vein (LSV) reflux (monopolar: 99%, segmental: 97%, $P = 0.44$) and sapheno-femoral junction incompetence (monopolar: 88%, segmental: 80%, $P = 0.07$). Half had short saphenous vein (SSV) reflux (monopolar: 51%, segmental: 49%, $P = 0.73$) and a third had deep vein reflux (monopolar: 29%, segmental: 34%, $P = 0.38$). In addition to LSV RFA, 20% of patients within the monopolar group had anterior accessory great saphenous vein (AAGSV) RFA, compared to 3% within the segmental group ($P = 0.01$). RFA was performed to SSV in 14% of patients within the monopolar group and 8% within the segmental group ($P = 0.14$). Postoperative outcomes were similar in both groups. Transient superficial neuropathy was 8% in both groups ($P = 0.83$), phlebitis occurred in 4% of monopolar group and 1% of segmental group ($P = 0.28$). No deep vein thrombosis nor recurrences occurred within both groups.

Discussion & Conclusion:
Both monopolar and segmental RFA are safe modalities in treating lower limb CVI, with similar clinical outcomes and low complication rates. The significant advantage of monopolar is the shorter active catheter tip, allowing for treatment of shorter vein segments such as AAGSV.

CR-130

The Efficacy of Cataract Surgery for the Long-Term Control of Intraocular Pressure

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Background & Hypothesis:
Control of intraocular pressure (IOP) of the eye is essential in the management of glaucoma, which is an important cause of blindness. Conventional medical and surgical therapies for glaucoma entail significant risks and side effects. Clinical experience suggests that IOP reduction may occur after cataract extraction. However, there are no long term systematic studies among Asian populations. We aimed to evaluate the long-term IOP change after cataract extraction and to assess the effects of ocular and systemic factors affecting IOP control.

Methods:
In a series of 158 consecutive patients undergoing routine cataract surgery, the postoperative IOP was measured at regular intervals up to 5 years. Comparison of IOP measurements was performed using repeated-measures ANOVA, and clinical and surgical factors affecting IOP were analysed using multivariate analysis.

Results:
The mean preoperative IOP was 15.1 mmHg. At all follow-up intervals, there was a significant decrease in mean postoperative IOP: 13.6 mmHg on postoperative day 1 (POD-1) ($P = 0.035$), at 1 month (13.3 mmHg, $P < 0.001$), 6 months (13.5 mmHg, $P < 0.001$), and 1 year (13.0 mmHg, $P = 0.001$). Eyes with higher preoperative IOP (>16mmHg) experienced significantly greater decrease in IOP compared to those with lower preoperative IOP at all time points (4.4 mmHg vs 0.3 mmHg at 3 months, $P = 0.002$). Increased postoperative inflammation was a risk factor for higher IOP postoperatively.

Discussion & Conclusion:
This study provides evidence that cataract surgery may be useful in IOP control. There is a significant and sustained decrease in IOP after cataract surgery, with larger decrease occurring among those with higher preoperative IOP (>15mmHg).

CR-131

Factors Affecting Improvement in Patient-reported Quality of Life following Cataract Surgery

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Background & Hypothesis:
We aimed to evaluate the visual quality of life (QOL) of patients with cataracts before and after cataract surgery and to assess factors affecting the change in QOL.

Methods:
This was a prospective, questionnaire-based study of 20 consecutive patients undergoing cataract surgery. Patients' QOL was assessed before and after cataract surgery using Time Trade-Off (TTO), Standard Gamble for Death (SGD), Standard Gamble for Blindness (SGB) Utilities and Visual Function-14 (VF-14) questionnaires.

Results:
The mean age of the patients was 66.2 years (range, 48 to 80, SD ± 8.9). All the visual quality indicators improved after cataract surgery (VF-14: 74.5 to 96.3, $P = 0.001$; TTO 0.86 to 0.89, $P = 0.75$; SGD 0.88 to 0.98, $P = 0.06$; and SGB 0.84 to 0.98, $P = 0.029$). Preoperatively, the mean VF-14 score was lower for subjects with advanced cataracts (advanced: 67.3, early: 82.7). There was a greater improvement in VF-14 score after cataract surgery for patients with advanced cataracts (39.4) compared to those with early cataracts (12.3) ($P = 0.013$). The mean VF-14 score improved from 72.8 to 93.4 in patients with VA >20/40 compared to 78.8 to 98.3 for those with VA ≤20/40 initially. SGD and SGB correlated with each other both pre- and postoperatively ($P <0.001$). There were no correlations between VF-14 and utility values.

Discussion & Conclusion:
There are improvements in quality of life indicators after cataract surgery using both VF-14 and utility values. Patients' visual function improved following cataract extraction, with the improvement greater for those with more advanced cataract disease and poorer VA initially. Standard gambles for death and blindness correlated well.

CR-132

Predictors of Serious Infections in a Multiethnic Rheumatoid Arthritis Cohort

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Background & Hypothesis:
We aimed to examine the predictors of serious infections in a cohort of patients with rheumatoid arthritis (RA).

Methods:
Data from the first study visit from a registry of 1040 patients with RA was used in the analysis. We obtained details of all serious infections, defined as those requiring hospitalisation or intravenous antibiotics, from electronic health record. We compared patients with and without serious infections using univariate analysis and logistic regression.

Results:
The observations span 11,113 patient-years. A total of 283 patients (27%) developed serious infections, of which 95 (9%) had 2 or more episodes. The commonest infections were pneumonia (35.3%), urinary tract (32.1%), dermatological (24%) and gastrointestinal (12%). With univariate analysis, we found that patients with serious infections tend to be male (20.5% vs 14%, $P = 0.011$), have higher age at diagnosis (mean 52.6 years vs 45.1, $P < 0.001$), are more poorly educated (11% postsecondary education vs 19.5%, $P < 0.001$), smoked tobacco (18.2% smokers vs 12%, $P = 0.015$), have higher disease activity (DAS 3.72 vs 3.46, $P = 0.0067$), have 1 or more comorbidities (78.5% vs 61.2%, $P < 0.001$), have more disability [median Health Assessment Questionnaire (HAQ) score 0.5 vs 0.25, $P < 0.001$], have radiographic erosions (62.2% vs 53.1%, $P = 0.009$) and worse ACR functional status (37.5% class 2 and above vs 25.4%, $P < 0.001$). On multivariate analysis, the presence of comorbidities, radiographic erosions and poorer HAQ score remain statistically significant.

Discussion & Conclusion:
Predictors for serious infections in RA at the baseline study visit are the presence of comorbidities, radiographic erosions and poorer HAQ score.

CR-133

Postoperative Radiotherapy Improves Survival in Postmenopausal Breast Cancer Women with 3 Positive Nodes

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Background & Hypothesis:
The benefit of radiotherapy (RT) in postmenopausal women with N1 disease (1 to 3 positive nodes) remains controversial. Guidelines make no clear recommendations and RT is discussed on a case-by-case basis. We aimed to evaluate how RT affects the clinical outcome in postmenopausal patients with N1 disease.

Methods:
A retrospective review was performed of 222 postmenopausal women with N1 disease who underwent curative breast cancer surgery, from 2004 to 2011 in our institution. All patients underwent axillary clearance. For patients who received RT, 3-fields were included; total dose was 50Gy with a 10Gy boost to the tumour bed after wide local excision (WLE).

Results:
Of the 222 patients, 163 had mastectomy and 59 WLE; 115 patients (51.8%) had RT (50 of whom had WLE) and these patients were more likely to be younger, with more positive nodes, higher tumour grade, lymphovascular invasion and oestrogen negative tumours (P <0.05). There was no significant difference in the 5-year recurrence-free or overall survival between those who received RT and those who did not (P >0.05). Subgroup analyses demonstrated that among those who did not receive RT, those with 3 positive nodes (vs 1 to 2 positive nodes) had shorter 5-year overall survival (P = 0.04; HR = 5.70; 95% CI, 1.1 to 30.00). Postoperative RT improved 5-year overall survival in patients with 3 positive nodes (P = 0.05; HR = 0.18; 95% CI, 0.01 to 1.00).

Discussion & Conclusion:
Among postmenopausal women with N1 disease, RT should be considered when 3 nodes are positive.

CR-134

A Study of the Biliary Complications of 75-150um Size Beads

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Background & Hypothesis:
Drug eluting beads (DEB) is an emerging embolic in TACE (transcatheter arterial chemoembolisation). While there is literature surrounding treatment response and efficacy, literature surrounding biliary complications in particular with the use of small (75um) beads remains limited. The purpose of this study is to elucidate the incidence and natural history of biliary complications arising from small beads.

Methods:
In this retrospective study, patients who had TACE from 2011-2015 in our institution were included. Reviewing electronic medical records and PACS images by blinded diagnostic radiologists, the imaging features of biliary complications and mRECIST scores were independently analysed. The demographics and treatment specifics of the patients were collected. Those positive for complications were analysed for subsequent pathologies.

Results:
Ninety-eight patients who met the inclusion criteria were analysed. Two-hundred DEB-TACE treatments were recorded in this study. Aetiologies were hepatocellular carcinoma (n = 83) and metastatic disease (n = 15) with doxorubicin and irinotecan as treatment respectively. They received 75-150um (n = 66) or 100-30um DEB (n = 32). Ten had imaging features of complications (75um n = 9, 100um n = 1) including portal vein narrowing (n = 1), portal vein thrombosis (n = 1), biloma (n = 3) and bile duct dilatation (n = 8, lobar = 3, segmental = 3, sectorial = 2). mRECIST scoring, small-beads compared to large-beads are, complete response (n = 26, 53.1%, n = 7, 25.9%), partial response (n = 10, 20.4%, n = 2, 7.4%), stable disease (n = 9, 18.4%, n = 8, 29.6%) and progressive disease (n = 4, 8.2%, n = 8, 29.6%).

Discussion & Conclusion:
Within the limits of this study, there is an increase in biliary complications from the use of small DEB, although most could be treated conservatively. However, smaller beads have better tumour response than larger beads.

CR-135

Correlation of the Electronic Frailty Index (EFI) with Geriatric Screening Findings in an Emergency Department (ED)

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Background & Hypothesis:
The EFI is a new tool based on 36 health deficits, mostly obtainable from existing electronic health data. We sought to determine if EFI correlates with findings from geriatric screening performed in our ED.

Methods:
A total of 295 elderly ED patients receiving geriatric screening between 1 February to 7 July 2015 were included. Their EFI was calculated by dividing the number of deficits against 36. Their 4 frailty groups were then analysed against the number of geriatric issues found, cognition, function, and ED disposition.

Results:
A total of 18.6% of our patients were fit; 53.2%, 22% and 6.1% were mildly, moderately and severely frail respectively. The median age of fit patients was significantly younger than patients with mild (P <0.01) and moderate (P <0.001) frailty. Higher frailty class was significantly associated with more clinical problems identified during geriatric screening (P <0.001), poorer cognition (abbreviated mental test; P <0.01), and poorer function (basic and instrumental activities of daily living; both P <0.001). Higher frailty patients were also significantly more likely to be admitted ($P = 0.001$) or referred to a geriatric clinic (P <0.001).

Discussion & Conclusion:
The EFI has been suggested as a way to routinely measure frailty. We have shown that it appears to correlate well with clinical assessment and ED disposition. We propose that autonomic EFI scoring of elderly patients may help guide their management in a busy ED.

CR-136

Act-FAST Phase 1: Factors Leading to Delayed Door-to-Needle Times for Thrombolysis in Acute Stroke Patients Presenting to the Emergency Department

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Background & Hypothesis:
The American Heart Association/American Stroke Association recommends a door-to-needle time (DTN) of <60 minutes, with an 80% compliance rate. In 2014, only 48.7% of patients received thrombolysis within 60 minutes in Tan Tock Seng Emergency Department (ED). This is phase one of a clinical process improvement project to increase the percentage of patients with DTN <60 minutes. The primary aim of this study is to identify reasons leading to DTN >60 minutes.

Methods:
A retrospective study was done on all ED stroke patients who received intravenous thrombolysis from January 2014 to June 2015. Data on patient demographics, mode of arrival, nursing triage acuity, time of presentation was collected. Door-to-physician (DTP), door-to-imaging (DTI), and imaging-to-needle (ITN) (decision) times were also collected. Qualitative analysis was conducted to determine reasons for delay.

Results:
Overall, 128 patients received intravenous thrombolysis with a median age of 67 years old, and 52.3% were thrombolysed within 60 minutes. Factors significantly associated with DTN <60 minutes were standby arrivals by SCDF ambulances and accurate nursing triage priority. Most patients arrived via standby SCDF ambulances (77.3%); 18.8% self-presented; 3.9% via non-standby ambulances; 55 patients (42.9%) visited ED during office hours. Median DTP was 9 minutes (52.3% <10 minutes); median DTI was 27 minutes (42.1% <25 minutes) and median decision time was 33 minutes.

Discussion & Conclusion:
The mode of arrival and accuracy of nursing triaging were both significant factors found to be related with DTN >60 minutes. Although time of presentation during non-office hours was originally hypothesised to be a significant factor, it was not.

CR-137

Role of Swivel Arm Board to Enable Cone Beam Computed Tomography Use in Transradial-Transarterial Chemoembolisation

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Background & Hypothesis:
We aimed to evaluate the usefulness of a swivel arm board to permit use of cone beam computed tomography (CBCT) in transradial-transarterial chemoembolisation (R-TACE).

Methods:
A retrospective study was done on R-TACE from November 2015 to May 2016 using Picture-Archiving and Communication-System and nationwide electronic records to evaluate patient demographics, characteristics of hepatic tumours, technical information and postprocedural findings.

Results:
Among 67 TACE found, 20 were R-TACE completed in 17 people (men, n = 13; women, n = 4; mean age 69.5 years) for hepatocellular carcinoma (n = 14) and metastatic disease (n = 3). Cirrhosis (hepatitis B, n = 8; non-hepatitis, n = 9), Child-Pugh status (A, n = 13; B, n = 3), solitary HCC (n = 7) size (<3 cm, n = 3; 3-5 cm, n = 1; >5 cm, n = 3) and site (unilobar, n = 6; bilobar, n = 1), multifocal (n = 7) HCC site (unilobar, n = 3; bilobar, n = 4), metastasis site (bilobar, n = 3), AFP (<6, n = 7; 6-19, n = 1; >19, n = 6; range <1-5683) and CEA levels (mean 84, range 24-191) were recorded. Forty rounds of CBCT, embolic agents doxorubicin (50 mg, n = 11; 75 mg, n = 1; 100 mg, n = 5), irinotecan (60 mg, n = 1; 100 mg, n = 2), mitomycin (20 mg, n = 1) and delivery agents (60 microns, n = 2, mean 3 ml, 75 microns, n = 16, mean 2 ml; 100 microns, n = 1, 3 ml) and lipiodol (15 ml, n = 1) were administered. Mean inpatient stay was 2.4 days. Follow-up scans were assessed according to mRECIST criteria (complete-response, n = 7; partial-response, n = 4; stable-disease, n = 4; progressive-disease, n = 1). Thirty-day complication rate was assessed according to SIR Classification System for Complications by outcome (A, n = 1; C, n = 2; D, n = 5).

Discussion & Conclusion:
The use of swivel arm board for CBCT acquisition is feasible and should be applied to future transradial access procedures.

CR-138

Understanding Burden in Singaporean Family Caregivers of Persons with Dementia who Experience Distressed Behaviour

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Background & Hypothesis:
Managing distressed behaviour in persons with dementia is widely recognised as one of the most challenging aspects of dementia care. It is associated with poorer caregiver health, increased care costs and risk of institutionalisation. We aimed to measure the degree of burden experienced by family caregivers of persons with dementia who had distressed behaviour. We also sought to identify the personal and caregiving-related factors associated with clinically significant burden.

Methods:
Family caregivers attending the outpatient psychiatry clinic voluntarily completed an anonymous paper survey which included: 1) background information on the caregiver and person with dementia, and 2) self-reported scales – i) Revised Memory and Behaviour Problems Checklist (RMBPC), ii) Zarit Burden Interview (ZBI), and iii) General Health Questionnaire (GHQ-28).

Results:
Caregivers (n = 41) were mainly female (73.17%, n = 30) and mean age was 53.63 ± 12.47. Over half were married, undertaking paid employment and had provided care for over 3 years; 66% (n = 27) of caregivers reported clinically significant burden. They had significantly higher GHQ-28 scores ($P = 0.0394$), were more likely to be higher educated ($P = 0.026$) and never to have utilised caregiver support services ($P = 0.040$) previously.

Discussion & Conclusion:
Family caregivers of persons with dementia who have distressed behaviour experience considerable burden and are more likely to have poorer psychological health. The majority of caregivers need to grapple with work and domestic roles simultaneously, and have never utilised caregiver support interventions. Our service should proactively improve links between our caregivers and support services. A qualitative exploration of barriers to the utilisation of dementia support services should also be conducted.

CR-139

Efficacy of a Topical Proteinase-activated Receptor-2 Inhibitor on Cowhage-induced Pruritus: A Randomised Placebo-controlled Double-Blind Study

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Background & Hypothesis:
The importance of the protease-activated receptor-2 (PAR-2) pathway in many chronic pruritic conditions, particularly atopic dermatitis, is recognised. There were no published studies demonstrating PAR-2 inhibitors' effectiveness in inhibiting itch in humans. Methylbenzyl methylbenzimidazole piperidinylmethanone (MMP) is a heterocyclic compound with selective PAR-2 inhibitory effect. We aim to investigate the effects of a MMP-containing cream on cowhage-induced itch in healthy volunteers.

Methods:
A randomised, intra-individual parallel-comparative, double-blind, placebo-controlled trial was conducted on the volar forearms of 16 healthy volunteers (calculated from pilot data). The active cream containing MMP and the placebo vehicle cream were applied on each subject in a left/right randomised fashion. After 30 minutes, itch stimulus using normal saline skin prick (negative control), histamine skin prick (positive control) or cowhage spicules were performed to these pretreated sites. The primary outcome was itch sensation every 30 seconds for 5.5 minutes.

Results:
The intensities of itch induced by cowhage were greater than that of histamine over all time points. When cowhage spicules was used, the mean itch intensities reported at sites pretreated with the active cream were significantly and consistently less compared to sites pretreated with the vehicle cream, after adjusting for effect over time ($P = 0.027$).

Discussion & Conclusion:
Pretreatment with MMP reduces the intensity of itch induced by cowhage but not histamine. To our knowledge, this is the first study demonstrating the antipruritc efficacy of a PAR-2 antagonist in humans and its availability as a topical agent holds promise as a new adjunctive therapeutic agent in managing chronic pruritic dermatoses, in particular, atopic dermatitis.

CR-140

Transforming Patient Care through Application of Disruptive Technology in Skin Cancer: A Prospective Study on the Sensitivity and Specificity of In-Vivo Confocal For Diagnosis of Skin Cancer

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Background & Hypothesis:
Skin cancer ranks amongst the top 6 in Singapore, affecting more than 3000 patients annually. Currently, diagnosis is made through biopsy, an invasive surgery that results in scarring and causes patient considerable psychological stress as time to tissue processing and rendering of a biopsy report may take a week or more. Non-invasive imaging modalities, like in-vivo confocal (RCM), have shown much promise in the Caucasian population to diagnose skin cancer sans biopsy. This study aims to determine the sensitivity, specificity and cost-effectiveness of RCM for diagnosis of skin cancer in Singapore.

Methods:
A prospective, observer-blinded study whereby patients with clinically suspicious lesions were first imaged with RCM before biopsy. The RCM diagnosis was then compared to histology report. The sensitivity and specificity of RCM diagnosis are then calculated.

Results:
A total of 121 patients were recruited with 131 lesions imaged and biopsied. Of these, 83 were non-melanoma skin cancer. The sensitivity and specificity of RCM was 98.6% and 95.7%; much higher than reports of 82.9% and 95.7% quoted in European studies. There was 1 case of false-negative in the biopsy arm due to sampling error, but picked up by RCM. Taking a cost of $200 per biopsy, there is a potential cost savings of $600,000 for the 3000 cases annually.

Discussion & Conclusion:
RCM is a sensitive and specific tool for diagnosis of skin cancer. RCM transforms care of patient as diagnosis is immediate, with no risk of scarring or sampling error. This translates to significant cost savings for patients and more importantly, reduction of psychological stress.

CR-141

Measurement of Quantitative Serum Immunoglobulins and Specific Antibody Responses among Rheumatology Patients prior to B-cell Depletion Therapy

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Background & Hypothesis:
Hypogammaglobulinaemia may occur in systemic rheumatic disease (SRD) from underlying primary immunodeficiency (PID), nephrotic syndrome or immunosuppressive drugs including B-cell depletion therapy (BCDT).

Methods:
Consecutive patients considered for BCDT with rituximab were screened for baseline serum immunoglobulins (sIg). Those with sIg below the lower limit of normal were further evaluated for pneumococcal polysaccharide vaccine (PPSV23) and tetanus toxoid specific antibody responses.

Results:
There were 7 Chinese patients, of whom 5 were female. Median (interquartile range, IQR) age at diagnosis of SRD was 48 (26-67) years, and at diagnosis of hypogammaglobulinaemia 66 (47-71) years. SRD comprised systemic lupus erythematosus (4), antineutrophil cytoplasmic antibody-associated vasculitis [AASV] (2), and adult-onset Still's disease (1). Three patients had previous treatment with rituximab before current evaluation: 2 had no baseline sIg, 1 had normal sIg. PPSV23 responses showed ≥2-fold rise between pre- and postvaccination titres in >50% of serotypes in 4/7, and tetanus toxoid ≥2-fold rise in 3/7 cases. Three patients eventually required monthly intravenous immunoglobulins (IVIg) replacement 0.4 mg/kg following persistent hypogammaglobulinaemia and bronchiectasis/recurrent infections. This occurred at median (IQR) nadir sIgG 4.7 g/L (3.4-6) after 47 (28-48) months post-rituximab 2 g in 2 patients, 1 g in 1. Two had baseline blunted responses to PPSV23, all had blunted responses to tetanus toxoid. One demonstrated no repopulation of B-cells, 9 months after rituximab 2 g.

Discussion & Conclusion:
Baseline sIg and specific vaccine responses, with follow-up of sIg correlated with B-cell repopulation may help differentiate prolonged hypogammaglobulinaemia from BCDT and underlying PID.

CR-142

Shellfish/Crustacean Oral Allergy Syndrome is More Common than Anaphylaxis among National Service Pre-Enlistees

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Background & Hypothesis:
The presence of food allergy may affect deployability of military servicemen during National Service as catering to special dietary needs may not be possible during outfield training.

Methods:
Pre-enlistees who gave a history of childhood food allergy with potential airway and/or circulatory involvement were referred to the Allergy Clinic from 1 August 2015-31 May 2016 for further evaluation.

Results:
There were 120 male pre-enlistees comprising 26% of all referrals to the Allergy Clinic during the study period. The mean age was 19.3 ± 1.8 years, predominantly Chinese (74.2%) and Malays (17.5%). The most commonly reported foods were shellfish/crustaceans (78%), peanut (15.6%) and egg (6.5%). Self-limiting oral allergy syndrome, OAS (itchy lips and throat with/without lip angioedema) was the most common manifestation (n = 32, 41.6%) followed by anaphylaxis (n = 24, 31.2%). Majority of OAS was from shellfish/crustacean (90.6%); of which shrimp (81.3%), crab (68.8%) and lobster (65.6%) were most common. Mild childhood asthma (71.9%), allergic rhinitis (28.1%) and eczema (14.3%) were the most common atopic condition among individuals with shellfish/crustacean OAS. Skin prick tests were most commonly positive for shrimp (55.8), crab (50.7%), lobster (44.2%) and squid (15.5%) among the shellfish/crustacean allergic. Two pre-enlistees had food sensitive eczema to cow's milk and peanut respectively. There were no cases of food-dependent exercise-induced anaphylaxis.

Discussion & Conclusion:
OAS to shellfish/crustaceans was more common than anaphylaxis among pre-enlistees referred for confirmation of food allergy. The provision of shellfish/crustacean-free field rations may be an option for those with OAS who wish to contemplate combat vocations during National Service.

CR-143

Clinical Characteristics of Patients Referred to the Local Sleep Clinics for Evaluation of Obstructive Sleep Apnea

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Background & Hypothesis:
Obstructive sleep apnea (OSA) is a highly prevalent chronic disease of public health significance. We studied the demographic and clinical characteristics of patients presenting with suspected OSA.

Methods:
This is a descriptive retrospective study of 668 patients who presented to the specialist sleep clinics in 2 public hospitals in Singapore from May 2012 to August 2015 for suspected sleep apnea. Patients' clinical records and polysomnography results were reviewed.

Results:
OSA was confirmed in 96.3% polysomnographically with 89.2% having at least moderate to severe OSA. Mean age was 47 (SD = 15) years old. There was male preponderance (3:1) with 68.8% Chinese, 16.6% Malay and 9.7% Indian; 59.9% had one or more cardiovascular comorbid risks/diseases (hypertension, diabetes, hyperlipidaemia, ischaemic heart disease and stroke). Major reported symptoms were snoring (89.7%), unrefreshed sleep (74.8%), dry mouth (57.4%), frequent awakening (57%), choking/gasping during sleep (40.9%) and witnessed apnea (33.2%); 93.8% had 1 or more of the following signs (Friedman III /IV tongue position, low lying palate, tonsillar hypertrophy, elongated uvula, tongue scalloping, retrognathia, turbinate hypertrophy and deviated nasal septum); 66% were obese and/or had increased neck girth and/or unhealthy waist-hip ratio; 51.8% of them had normal Epworth sleepiness scale (ESS) of less than 10.

Discussion & Conclusion:
Moderate to severe OSA was prevalent among patients with suspected OSA referred to the sleep specialists. Snoring and unrefreshed sleep were still the commonest presenting symptoms. Majority had 1 or more anatomical and/or anthropometric risk factors. A significant proportion were not sleepy and had at least 1 or more cardiovascular comorbid conditions.

CR-144

Epidemiology of Hypopharyngeal Cancer at a Tertiary Institution in Singapore

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Background & Hypothesis:
The majority of epidemiological data surrounding hypopharyngeal carcinoma has traditionally come from Western data. The purpose of this study was to investigate the epidemiology of hypopharyngeal cancer in a tertiary hospital in Singapore, and to establish any differences with that of other populations.

Methods:
The records of 26 patients diagnosed with hypopharyngeal cancer from 2011 to 2016 were analysed retrospectively. Data on patient demographics, smoking and alcohol history, and subsites involved as diagnosed on panendoscopy and CT/MRI scans was reviewed.

Results:
The median age of patients was 70 (mean 69, age range 43-88), 92% were males, 81% were current or ex-smokers, and 48% had alcohol dependence; 92% presented at Stages III and IV (late-stage). The incidence of cancers arising from the 3 main subsites was 62% from the pyriform sinus, 19% from the posterior pharyngeal wall, and 19% from the postcricoid area.

Discussion & Conclusion:
The median age at diagnosis and incidence of T3/T4 and N2/N3 tumours is the highest compared to that of other study populations. Our patients shared similar gender distribution, smoking and alcohol history to international data. The majority of cancers arose from the pyriform sinus, similar to other studies. We conclude that the subsites involved in hypopharyngeal cancer are similar in distribution in Western and Asian populations. Data from our centre suggests later age and stage of disease.

CR-145

Initial Report of Accelerated Repetitive Transcranial Magnetic Stimulation (rTMS) Effectiveness in Treating Depression in a Singaporean Public Psychiatric Institution

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Background & Hypothesis:
rTMS is a US, FDA-approved novel, safe and effective treatment for treatment-resistant depression. There are currently 2 centres in Singapore with a clinical rTMS service. We report the initial results of the first public sector rTMS programme in Singapore.

Methods:
Patients with depression who had failed at least 1 antidepressant were eligible for rTMS treatment. rTMS was delivered via an algorithmic approach starting with right-sided stimulation at 120% of visually-assessed resting motor threshold at 1Hz. Patients not achieving response (50% decrease in MADRS) halfway through the acute course were changed to left-sided stimulation at 5Hz; 36,000 pulses were delivered. Patients were evaluated using Montgomery-Asberg Depression Ratings Scale (MADRS), Montreal Cognitive Assessment (MoCA) and Quick Inventory of Depressive Symptoms (QIDS-16).

Results:
Complete mood ratings were available for 4 of 5 patients. Baseline MADRS scores were 29 (SD 3.4), QIDS-16 15.7 (SD 5.1), MoCA 27.3 (SD 2.1). Two patients changed from left- to right-sided rTMS. There was a trend towards a large improvement in MADRS scores of 16.5 (SD 12.9, $P = 0.084$) and moderate improvement of QIDS-16 4 (SD 2, $P = 0.074$) and no significant worsening in MoCA -1.3 (SD 2.1, $P = 0.38$). Two of the 4 patients achieved remission of depression (MADRS <11) while the other 2 did not meet response criteria.

Discussion & Conclusion:
Accelerated rTMS appears to be a safe and effective treatment for depression in Singapore. Patients may be more likely to have either a large or small response rather than a moderate response to rTMS.

CR-146

Dose-adjusted R-EPOCH in Untreated De Novo Diffuse Large B Cell Lymphoma – A Single Centre Singapore Experience

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Background & Hypothesis:
There is little data comparing the treatment of de novo DLBCL with RCHOP chemotherapy (standard of care) and REPOCH (suggested superior in subtypes of DLBCL).

Methods:
A retrospective analysis of patients aged 18-70 treatment naïve de novo DLBCL who received RCHOP between 2009 to 2013, and REPOCH between 2013 to 2016 was conducted. Demography, disease characteristics, immunohistochemistry biomarkers for cell of origin (GCB versus ABC), treatment and responses were analysed. Two years overall survival (OS) and progression-free survival (PFS) were calculated.

Results:
A total of 46 patients (20 RCHOP, 26 REPOCH) were followed up. The characteristics between the groups were comparable: average age 54 and 53.9; 75% and 69% had stage 3 or 4 disease; 50% and 20% of the RCHOP group, and 73% and 23% of the REPOCH group have the ABC and GCB subtypes of DLBCL respectively. Median follow-up period was 40.5 and 16 months. Kaplain Meier survival curves showed the OS and PFS of REPOCH were greater than that of RCHOP, although not statistically significant (OS Log-rank test: $z = 0.71$, $P = 0.48$; PFS Log-rank test: $z = 1.52$, $P = 0.13$). The 2 years OS were 89% and 100%; and the 2 years PFS were 75% and 95%, respectively.

Discussion & Conclusion:
GCB is more common than ABC although the prevalence of ABC increases with age and is associated with inferior outcomes. Although not statistically significant, the number of patients with the ABC subtype was 3 times more prevalent than GCB, suggesting the disease biology may differ with ethnicity and may explain why our data suggests REPOCH to be superior to RCHOP.

CR-147

Experience with the Use of Single-Use Disposable Bronchoscope in the ICU in a Tertiary Referral Centre of Singapore

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Background & Hypothesis:
Flexible bronchoscopy is performed frequently in intensive care units (ICU) for various indications using the reusable conventional bronchoscope (CB). Recently, single-use disposable bronchoscope (SB) was introduced into the healthcare industry.

Methods:
A retrospective review of medical records of patients undergoing flexible bronchoscopy in the ICUs in year 2015 was conducted. Cases of rigid bronchoscopy were excluded.

Results:
Ninety-three patients undergoing flexible bronchoscopy in the ICU were studied; 83 bronchoscopies were performed using SB in 71 patients, and 24 using CB in 22 patients. The most common indications for using the SB were percutaneous tracheostomy (n = 37 [44.6%]]) in neuro ICU, followed by collecting specimens for microbiological evaluation (n = 20 [24.1%]) in the medical ICU. Airway inspection (8 [9.6%]), bronchial toilet (8 [9.6%)]), haemoptysis (5 [6%]), and intubation (3 ([3.6%]) were other indications for which SB was used. Microbiological yield of SB was 70% (14/20) vs 70% (7/10) for CB ($P = 1.0$). The median interval between identification of the need-to-start of the procedure was shorter with SB (10 minutes) vs CB (66 minutes, $P = 0.01$), while the cost was similar, SGD 450 vs SGD 472 respectively. Additionally, less (3 personnel) were needed to perform bronchoscopy with SB vs 5 with CB with additional resource sparing effect in terms of nursing personnel having to wheel the CB equipment to ICU.

Discussion & Conclusion:
SB is equivalent in performance to CB in ICU. Additionally, the SB may confer clinical, economic, and logistical advantages over the CB.

CR-148

Can EGFR-Tyrosine Kinase Inhibitors (TKI) Alone without Talc Pleurodesis Prevent Recurrence of Malignant Pleural Effusion (MPE) in Lung Adenocarcinoma?

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Background & Hypothesis:
Epidermal growth factor receptor-tyrosine kinase inhibitors (EGFR-TKIs) are effective against lung adenocarcinoma. However, limited data is available assessing the effectiveness of EGFR-TKI use in preventing re-accumulation of MPE. To our knowledge, there is no literature on comparison of talc pleurodesis with EGFR-TKIs alone on re-accumulation of MPE in the Asian population. We investigated if EGFR-TKI therapy for advanced lung adenocarcinoma with malignant pleural effusion (MPE) is also successful in preventing pleural fluid re-accumulation following initial drainage.

Methods:
An observational cohort study of patients with lung adenocarcinoma and MPE in the year 2012 was conducted.

Results:
Seventy patients presented with MPE from lung adenocarcinoma; 56 underwent EGFR mutation testing of which 39 (69.6%) had activating EGFR mutation and 34 (87.1%) received TKI; 20 were managed by pleural fluid drainage only whereas 14 underwent talc pleurodesis following pleural fluid drainage. Time taken for the pleural effusion to re-accumulate in those with and without pleurodesis was 9.9 vs 11.7 months, $P = 0.59$ respectively. More patients (n = 10, 25.6%) with activating EGFR mutation presented with complete opacification (white-out) of the hemithorax compared to none without activating EGFR mutation ($P = 0.02$).

Discussion & Conclusion:
In TKI-eligible patients, early talc pleurodesis may not confer additional benefit in preventing re-accumulation of pleural effusion and may be reserved for non-adenocarcinoma histology, or EGFR negative adenocarcinoma. Complete opacification of the hemithorax on presentation may serve as an early radiographic signal of positive EGFR mutation status.

CR-149

Significance of Coexistent Granulomatous Inflammation and Lung Cancer

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Background & Hypothesis:
Coexistence of lung cancer and granulomatous inflammation in the same patient confuses clinicians. We aimed to document the prevalence, clinico-pathological features, treatment outcomes, and prognosis in patients with coexisting granulomatous inflammation in patients undergoing curative lung resection for lung cancer in a tuberculosis endemic country.

Methods:
This was an observational cohort study of lung cancer patients undergoing curative resection between 2012 and 2015 in a tertiary centre in Singapore.

Results:
A total of 127 patients underwent lung resection for cancer, out of which, 19 (14.9%) had coexistent granulomatous inflammation in the resected specimen. Median age was 68 years and 58.2% were males. Overall median (range) survival was 451 (22-2452) days. Eighteen (14%) patients died at median duration of 271 days after surgery. The postsurgery median survival for those alive was 494 (29-2452) days in the whole group. Subgroup analysis did not reveal any differences in age, gender, location of cancer, radiological features, type of cancer, chemotherapy, past history of tuberculosis, or survival in patients with or without coexistent granulomatous inflammation.

Discussion & Conclusion:
Incidental detection of granulomatous inflammation in patients undergoing lung resection for cancer, even in TB endemic country, does not require any intervention. Such findings may be due either to mycobacterial infection in the past, or "sarcoid reaction" to cancer. Management of such patients does not require any alteration in the treatment from the existing lung cancer management guidelines.

CR-150

Pleural Fluid Neutrophil: Lymphocyte Ratio to Distinguish Malignant Effusion from Tuberculous Pleural Effusion

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Background & Hypothesis:
We aimed to assess the utility of pleural fluid neutrophil lymphocyte ratio (PF-NLR) for distinction of malignant pleural effusion (MPE) from tuberculous pleural effusion (TPE), as an objective test independent of clinical features.

Methods:
A prospective analysis of patients with exudative pleural effusions was done. Data pertaining to pleural fluid analysis, microbiology and relevant histopathology were analysed. PF-NLR was calculated from differential cell count of neutrophils and lymphocytes in the pleural fluid (%N/%L).

Results:
Eighty-four patients were diagnosed with MPE; 74 had malignant cells in pleural fluid, while tissue diagnosis was confirmed in the remaining 10 from extra-pleural sites; 34 patients had a diagnosis of TPE; 32 had confirmed tuberculosis (microbiological/histopathological evidence in pleural fluid, respiratory sample or pleural biopsy, pleural fluid ADA >24 in lymphocytic exudate). Two had empiric diagnosis of TPE. Pleural fluid neutrophil lymphocyte ratio (n = 116); malignant pleural effusion (n = 84); tuberculous pleural effusion (n = 32). *P* value mean value of PF-NLR: 0.66, 0.1, 0.01. There was a significant difference between the PF-NLR values between MPE and TPE (*P* = 0.01).

Discussion & Conclusion:
The PF-NLR may serve as an early discriminatory point-of-care indicator towards MPE. This simple test, at no added cost and available on day 1, can justify or guide early performance of interventions that procure tissue diagnosis, to expedite appropriate therapy/palliation.

CR-151

Elucidating the Brain Structural Patterns of Diminished Emotional Expression and Avolition in Patients with First-Episode Schizophrenia

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Background & Hypothesis:
Recent studies found 2 subdomains of negative symptoms, namely diminished emotional expression (DEE) and avolition. However, the neural substrates associated with these subdomains are still unknown.

Methods:
Symptom measures using Positive and Negative Syndrome Scale (PANSS) were obtained from 2304 schizophrenia subjects. Confirmatory factor analysis on PANSS item domains confirmed 2 negative subdomains: DEE and avolition. Of the 2304 subjects, brain structural MRI measures (subcortical volume, cortical thickness and surface area extracted using FreeSurfer neuroimaging tool suite) were obtained from 76 first-episode schizophrenia (FES) subjects. To identify brain regions associated with negative symptomatology, Pearson's correlation between PANSS negative symptom total score and brain measures was performed. Exploratory factor analysis was further conducted using residuals (partialling for covariates) of the correlated regions. Lastly, Spearman correlation between the identified brain factors and symptomatology, DEE and avolition was performed.

Results:
Among regions associated with negative symptoms, factor analysis identified 4 factors. The first factor consisted cortical thickness measures from the frontotemporal and limbic regions. The second factor consisted cortical surface area measures: right inferior parietal, left middle temporal and left precental gyrus. The third factor consisted temporal cortical thickness measures: bilateral parahippocampal gyrus, right fusiform gyrus and left entorhinal cortex. The last factor consisted parieto-occipital cortical thickness measures: bilateral precuneus and left lateral occipital cortex. All factors correlated significantly with negative symptom but not with positive symptomatology. The second and third factor correlated significantly with DEE and avolition.

Discussion & Conclusion:
This study suggests shared structures for DEE and avolition that do not associate with positive symptoms.

CR-152

Outcome of Neoadjuvant Chemotherapy in Stage III Breast Cancers

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Background & Hypothesis:
Stage III breast cancer is considered locally advanced. Neoadjuvant chemotherapy can be used for downstaging, but has not been proven to improve survival. We aimed to determine the effect of neoadjuvant chemotherapy on outcome in Stage III breast cancers.

Methods:
A retrospective review was performed of 367 patients diagnosed with Stage III breast cancer from 2006 to 2012.

Results:
Half the patients (192 of 367, 52.3%) were clinically staged as Stage III, based on large tumour size, clinically matted axillary nodes or palpable ipsilateral supraclavicular nodes. Most of the remaining 175 patients (47.7%) had small tumours and were staged as III because of N2/3 nodal involvement. Outcome was similar between these 2 groups (P >0.05). In total, 128 patients (34.9%) received neoadjuvant chemotherapy and these were more likely of Malay ethnicity, with clinically T3/T4 tumours, and with clinically palpable ipsilateral axillary or supraclavicular nodes (P <0.05). Neoadjuvant chemotherapy induced an overall response; tumours were smaller ($P = 0.01$) and nodal involvement was less extensive (P <0.01) compared to tumours where surgery was the primary treatment. Recurrence was similar between both groups (P >0.05) although interestingly, overall survival appeared worse among those who received neoadjuvant chemotherapy (P <0.01, HR 2.02, 95% CI 1.28-3.18). This was significant even after adjusting for age ($P = 0.01$).

Discussion & Conclusion:
One-third of patients with Stage III cancer received neoadjuvant chemotherapy. Neoadjuvant chemotherapy did not reduce recurrence, but was instead associated with poorer overall survival.

CR-153

Characteristics and Healthcare Utilisation of Middle-Aged and Seniors with Endogenous Eczema

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Background & Hypothesis:
Endogenous eczema (EE) is a common chronic skin condition resulting from internal physiological processes not necessarily requiring external stimuli. We hypothesise that people with more severe EE consult doctors more frequently. This study describes the type and severity of EE in middle-aged and seniors who visit a specialist dermatology clinic and their utilisation of healthcare services.

Methods:
A survey was conducted with 64 adults aged 50 years and above with prevailing EE from the Dermatology Clinic of National University Hospital from June to July 2012. Type of EE was assessed by a dermatologist and its severity was scored using the Investigator's Global Assessment. These were correlated with the number of doctors consulted previously for their condition and number of visits to the dermatology clinic.

Results:
Non-specific endogenous eczema was predominant (43.8%). Most patients had clear to mild eczema (73.4%). Half the patients had only consulted 1 dermatologist(s) for EE. Among those who had consulted other doctor(s), approximately 2/3 saw another doctor more than 5 years ago. Majority (62.5%) had more than 5 visits since their first consultation. There was no statistical difference between severity of EE and having consulted another doctor for EE. Milder disease was weakly correlated with more visits (Spearman rank coefficient -0.312, $P < 0.01$).

Discussion & Conclusion:
Given the chronicity of EE, many patients did not consult their doctors regularly. We could strengthen the capabilities and confidence of our primary care providers (PCPs) in managing clear to mild EE and explore long-term management with a sole PCP.

CR-154

Clinical Characteristics, Risk Factors and Outcomes of South East Asian Patients with Acute Pulmonary Embolism

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Background & Hypothesis:
Acute pulmonary embolism (PE) is a potentially lethal condition that is frequently underdiagnosed. We therefore sought to evaluate the clinical characteristics and clinical outcomes (in-hospital) of patients diagnosed with PE in our region.

Methods:
From January 2008 to March 2013, 377 patients were admitted to our tertiary institution with acute PE. Data were collected retrospectively on baseline characteristics, results of electrocardiographic and imaging, therapeutic modality and hospital course.

Results:
Ten percent and 90% of the patients presented with massive and submassive PE respectively; 6% of patients had saddle PE. The most common presenting symptom was dyspnea (73%) followed by chest pain (12.7%), haemoptysis (3.7%); 42% of patients were tachycardic at presentation and 38% had underlying deep venous thrombosis. The majority of patients (45%) had normal electrocardiogram at presentation followed by sinus tachycardia (24%), right bundle branch block/right heart strain (12%) and S1Q3T3 pattern (11.5%). Risk factors for PE were idiopathic cause (33.4%), immobilisation (23%) and malignancy (6.1%). Approximately 36% of the patients had evidence of right ventricular dysfunction/dilatation on transthoracic echocardiogram. Treatment strategies included low molecular weight heparin (81%), thrombolysis (8%), unfractionated heparin (7%) and Angiojet rheolytic thrombectomy (3%). Bleeding complications occurred in 9% of the patients (major bleeding in 3.2%).

Discussion & Conclusion:
Acute PE in the South East 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 diagnosis of PE as majority of patients are symptomatic. The bleeding complications from treatment are also high.

CR-155

High Definition Optical Coherence Tomography (HD-OCT) as a Bedside Tool for Alopecia Areata

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Background & Hypothesis:
High definition optical coherence tomography (HD-OCT) is a non-invasive, real-time imaging modality which allows in vivo visualisation of tissues. Its ability to produce high resolution slice and en face images of skin up to a depth of 1 mm makes it a promising bedside diagnostic and monitoring tool for various dermatological disorders. Its use in hair disorders has not been explored.

Methods:
We recruited 30 patients with clinically diagnosed AA over the scalp, who consulted the Hair Clinic at the National Skin Centre, Singapore, from May 2015 to November 2015. HD-OCT images were obtained from AA patches in which no hair is clinically evident.

Results:
We observed that HD-OCT was able to detect hair within follicles in a group of patients with alopecia areata even before they were clinically evident. Over the areas of alopecia, hair follicles containing hair would appear homogenously dark with a bright filling at the centre, representing high refractivity of hair shafts containing keratin.

Discussion & Conclusion:
This novel bedside investigative tool can help clinicians determine when to cease treatment, preventing potential local or systemic adverse effects from repeated intralesional corticosteroid injections.

CR-156

To Improve Referral Rate to Palliative Care for Patients with Poor Prognosis in Neurosurgical Intensive Care Unit

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Background & Hypothesis:
There is increasing evidence that a well structured palliative care initiative in the ICU can provide important benefits for patients and families. We hypothesise that we can improve quality of care of a subgroup of patients requiring palliative care in ICU.

Methods:
We set up a multidisciplinary team consisting of intensivist, palliative care, neurosurgeons, nurses and medical social worker. We defined a palliative care referral trigger for patients as: 1) hypoxic ischaemic encephalopathy; 2) severe head injury with poor neurological prognosis; 3) extensive intracerebral/subarachnoid haemorrhage with poor neurological prognosis; and 4) low presenting GCS less than 6. We then established weekly ICU-palliative care rounds to discuss current patients and those discharged from ICU, with a care plan for each patient. We wanted to ensure a family conference was conducted within 72 hours of admission, to convey prognosis and treatment plan to family.

Results:
We achieved improvement from baseline of 30% to 100% within 6 months for patients in NICU fitting the trigger criteria. Survey of relatives showed good communication, with honest and timely feedback from the medical team. Symptom control of patients was also good. There was cost saving of 1.2 ICU days.

Discussion & Conclusion:
Palliative care is an important aspect of ICU care for a subgroup of patients with poor prognosis. Quality of care was good. Symptom control was good. There was additional cost saving of ICU days.

CR-157

Perception among Treatment-seeking Gamblers in Singapore: The Attraction and Impact of Online Gambling

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Background & Hypothesis:
Online gambling has gained growing attention in Singapore, with the Remote Gambling Act coming into force in February 2015. This study explored the views of online gamblers who sought treatment at the National Addictions Management Service (NAMS). The attractions to online gambling and impact of online gambling were studied.

Methods:
Using a semi-structured questionnaire, 100 pathological or problem gamblers who sought help at NAMS were interviewed. Those who gambled online regularly in the past year were recruited to the study.

Results:
The 24-hour accessibility (85%), convenience and privacy and anonymity (68%) and better odds online (57%) were cited by more than half of the participants as main initial attractions towards this mode of gambling. Finance (97%), emotional health (85%) and interpersonal relationships (84%) were reported as notable aspects affected as a result of online gambling.

Discussion & Conclusion:
Given the paucity of research about online gambling locally, the findings provide a better understanding of online gambling among treatment-seeking population. Attractions towards online gambling were similar to those of research studies worldwide. It was noted that the impact of online gambling shared common features with the typical harms associated with offline gambling. While the nature of the harms is not unique, future research can explore if the extent of it may be different across the modes. As participants of the semi-structured questionnaire were treatment-seeking patients, results of the study may not be generalisable to all online gamblers.

CR-158

Palliative Outpatient Hot Clinic: Rapid Access for Oncology Patients Visiting Emergency Department (ED) in a Tertiary Hospital in Singapore – A One-Year Experience

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Background & Hypothesis:
Oncology patients often present with symptoms at ED. While most patients require admission for further management, some patients can be discharged from ED with outpatient follow-up. However, most patients were given 4- to 6-week appointment. In light of this service gap, our department collaborated with ED to facilitate rapid access to Palliative Outpatient Hot Clinic (POHC).

Methods:
We performed a retrospective review of patients seen in the ED who satisfied the referral criteria to POHC. The basic demographics of patients were collected. Various outcomes of POHC referral were documented using a predetermined protocol.

Results:
A total of 17/68 (25%) patients who attended ED and referred to POHC were included; 11 (64.7%) were seen after-office hours; 12 (70.6%) were ≥60 years old, 14 (82.4%) were male, and 11 (64.7%) had ECOG ≤2. Among them, 6 (35.3%) were known to Palliative Home Care Service. The most common diagnosis was gastro-intestinal carcinoma (n = 6; 35.3%). Eight (47.1%) patients were receiving treatment. All were referred for poor symptom control: pain (n = 8; 47.1%) was the most common symptom. Ten (58.5%) were given an appointment with POHC within 3 days; 4 (23.5%) were seen within 3 days of ED visit. Among 13 patients not seen within 3 days, 7 (53.8%) referrals were screened and rescheduled, 3 (23.1%) were readmitted to hospital; 2 (15.4%) requested to change appointment and 1 (7.7%) defaulted the appointment.

Discussion & Conclusion:
Rapid access to POHC is vital in the partnership with ED to allow the seamless and timely provision of palliative care for oncology patients.

CR-159

Early Clinical Characteristics and Risk Factors of Dengue Patients with Severe Organ Involvement

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Background & Hypothesis:
Dengue results in significant public health burden, particularly in the tropical regions. Dengue manifests in a wide spectrum and outcomes clinically, including severe organ involvement based on 2009 WHO guidelines. However, there is limited clinical characteristics and risk factors published to facilitate the triage process to identify dengue patients at higher risk of severe organ involvement. This study aims to understand the early clinical characteristics and risk factors of adult dengue patients with high risk of developing severe organ impairment.

Methods:
A retrospective matched case-control study was conducted using data collected from 2005 to 2008 at TTSH. Each case with severe organ involvement was randomly matched to 5 patients without, by presenting year as controls. Dengue PCR-confirmed patients, probable-dengue patients with positive IgM or IgG fulfilling WHO 1997/2009 criteria, were included in this study. Data at presentation were obtained from medical records. Univariate and multivariate conditional logistic regressions were performed to account for the matching factor and minimise confounding effects respectively.

Results:
Age and existing comorbidities are risk factors of severe organ involvement progression. Patients ≥60 years old has 2.75 times higher (AOR: 2.75; 95% CI, 1.3-5.8) risk than age between 12-29 years old. Patients with both diabetes and hyperlipidaemia have 5.26 times higher (AOR: 5.26; 95% CI, 1.91-14.49) risk than patients with either having diabetes or hyperlipidaemia or no comorbidity.

Discussion & Conclusion:
Early identification of risk factors and clinical characteristics are critical to complement the existing clinical guidelines to identify predisposed dengue patients who are at higher risk of severe organ involvement in hospital.

CR-160

Ultrasound and Chest X-Ray in Adult Dengue

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Background & Hypothesis:
The pathognomonic feature of dengue hemorrhagic fever (DHF) is a transient increase in vascular permeability resulting in plasma leakage. Several studies assessed ultrasound as a tool in gauging disease severity in detecting plasma leakage into tissues and body cavities. Limited studies were done on adults.

Methods:
We conducted a prospective study to recruit adult patients presenting with acute fever from August 2011 to September 2012 to TTSH. Demographic, clinical and laboratory data were collected. Ultrasound assessment included pericardial, pleural and abdominal cavities including gall bladder wall thickness, liver, spleen and ascites on enrolment visit, recovery and convalescent. Postero-anterior chest X-ray (CXR) together with right lateral decubitus view was done on the same day as ultrasound. Plasma and DHF were defined using 1997 World Health Organization criteria.

Results:
Of 110 recruited patients, 74 had laboratory-confirmed dengue, 11 probable dengue and 25 dengue-negative. Among confirmed cases, median age was 34 years, 98% were males, and 24% were hospitalised. Median duration of fever on enrolment was 6 days (range, 2-10). Fluid was detected by ultrasound in 2 cases and CXR in 10 cases. There were 19 cases with plasma leakage and 11 with DHF. One ultrasound and 6 CXR detected fluid in those with hypoproteinaemia; 1 patient with HCT change and hypoproteinaemia had fluid on CXR. Of 11 DHF cases, fluid was detected by CXR in 4 cases and ultrasound in 1 case.

Discussion & Conclusion:
Detection of fluid by imaging was uncommon in our adult dengue cohort. Its utility in severe adult dengue needs further study.

CR-161

Excluding Severe Bacterial Infection in Systemic Neutrophilic Dermatoses: Negative Predictive Value of Procalcitonin

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Background & Hypothesis:
Patients with generalised pustular psoriasis, acute generalised exanthematous pustulosis (AGEP) and Sweet syndrome, often present with fever, leucocytosis, neutrophilia and raised inflammatory markers. We refer to these diseases as systemic neutrophilic dermatoses and their presentation is difficult to differentiate from severe bacterial infections, leading to delay in appropriate management. Procalcitonin is a specific marker for severe bacterial infections and could be used to exclude its presence in systemic neutrophilic dermatoses. We aimed to evaluate the predictive value of procalcitonin for the absence of severe bacterial infections in systemic neutrophilic dermatoses patients.

Methods:
This is a retrospective review of inpatients referred to the dermatology service at a tertiary hospital in Singapore between May 2012 and April 2015 diagnosed with systemic neutrophilic dermatoses. Patients who had severe pneumonia resulting in shock or requiring mechanical ventilation, peritonitis, meningitis or bacteraemia were classified as having a severe bacterial infection. Patients whom procalcitonin were not measured were excluded. Fifty-nine patients were included but only 41 had procalcitonin levels measured.

Results:
Using a procalcitonin cutoff of 1.3ug/L, it had 100% sensitivity and 79.4% specificity in predicting concurrent severe bacterial infections in systemic neutrophilic dermatoses patients. Procalcitonin <1.3ug/L has a positive and negative predictive value of 0.50 and 1.0 respectively in predicting concurrent severe bacterial infections in these patients.

Discussion & Conclusion:
The study suggests that systemic neutrophilic dermatoses patients with a procalcitonin value <1.3ug/L are very unlikely to have a concurrent severe bacterial infection. In such instances, immunosuppressants can reasonably be instituted early to treat their diseases.

CR-162

Retrospective Analysis of Bone Substitute in the Management of Metaphyseal Fractures: Cerament

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Background & Hypothesis:
In recent years, the increase in utilisation of bone substitutes in the reconstruction of bone defects has been fuelled by the rise in donor site complications associated with autologous bone harvesting. However, the ability of bone substitute to stimulate bone union while maintaining fracture reduction has been a topic of debate. Cerament bone void filler (CBVF) is a novel biphasic and injectable ceramic bone substitute that has high compressive strength and the ability to promote cancellous bone healing.

Methods:
This is a retrospective study to evaluate the surgical outcome of utilising CBVF in the treatment of metaphyseal bone defects in a level one trauma centre over 1-year period in 2015. The patients were followed up for at least 6 months after surgery and clinical parameters such as wound site complications and functional status were collected. Radiographic imaging was obtained to determine loss of fracture reduction and cement resorption.

Results:
Seven patients with metaphyseal fractures were enrolled comprising: i) 1 proximal humerus fracture; (ii) 2 tibial plateau fractures; and (iii) 4 calcaneal fractures. No patient showed significant collapse in fracture reduction after 6 months of follow-up. Cement resorption was noted in 1 patient as early as 3 weeks after surgery. There was no case of cement leak or wound site complication.

Discussion & Conclusion:
Cerament bone void filler (CBVF) showed to be a promising bone graft substitute in the management of metaphyseal bone fractures.

CR-163

The Effect of Neoadjuvant Chemoradiotherapy on the Prognostic Value of Lymph Node Harvest in Rectal Cancer

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Background & Hypothesis:
Lymph node (LN) harvest is a well established prognostic factor in colon cancer patients. Neoadjuvant chemoradiotherapy is known to decrease LN yield and therefore the prognostic value of LN harvest in these patients is debatable. This paper aims to assess the influence of neoadjuvant chemoradiotherapy on LN harvest, and to evaluate LN harvest as a prognostic tool for patient outcomes.

Methods:
We retrospectively reviewed all patients who underwent elective surgery for rectal cancer from 2006 to 2013. All patients with R1/2 resections, presence of metastases, and those operated on for recurrence were excluded. Patient demographics, clinical features, operative details, LN harvest and operative outcomes were recorded. Outcome measures include length of stay, 30-day mortality, recurrence rates and overall survival. Values of $P < 0.05$ were considered significant.

Results:
A total of 255 patients met the study criteria. Median age was 66 years, of which 173 (68%) were male; 93 (36%) patients received long-course neoadjuvant therapy, and 121 (45%) patients were Stage 2 and below. The median LN harvest was 17, which was significantly reduced by neoadjuvant chemoradiotherapy ($P < 0.01$). Median length of stay was 7 days, with a major postoperative complication rate of 12%. Recurrence and mortality rates were 18% and 20% respectively. Using ROC analysis, we were unable to demonstrate LN yield as a significant prognostic factor for disease-free survival for either patients undergoing neo-adjuvant chemoradiotherapy or not.

Discussion & Conclusion:
In our study population, LN yield in rectal cancer cannot be used as a reliable prognostic indicator in rectal cancer patients, regardless of whether neoadjuvant chemoradiotherapy was performed.

CR-164

Clinical Profile and Surgical Outcomes of Gastrointestinal Stromal Tumour

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Background & Hypothesis:
The gastrointestinal stromal tumours (GISTs) are the most common mesenchymal tumours of the gastrointestinal (GI) tract. The aim of this study is to analyse the clinical profile and surgical outcomes of GIST.

Methods:
All patients with histologically confirmed GIST following a surgical resection were included from January 2008 to December 2015. Demographic data, clinical profile, surgical and oncologic outcomes were retrospectively collected.

Results:
Seventy patients with a median age of 66 years (range 36-81) were included; 41 (58.6%) patients were males. Majority of GIST were located in the stomach (n = 55, 78.6%). Thirteen patients (18.6%) had small bowel GIST and 3 patients (4.3%) had GIST in the rectum. The most common presenting symptom was malena (40%), anaemia (31.4%) and abdominal pain (22.9%). Median tumour diameter was 4.5 cm (range, 0.4-40 cm) and 31 (44.3%) tumours were >5 cm in greatest dimension. Laparoscopic surgery was performed in 43 (61.4%) patients with 6 (13.9%) open conversions. Median operating time was 130 minutes (range, 15-610), blood loss 100 ml (range, 50-1500) and length of stay was 6 days (range, 1-73). There was no 30-day mortality. Twenty-six (37.1%) GIST had mitotic count >5/50HPF. At the time of analysis, 7 (10%) patients are not alive and 1 of these patients passed away due to metastatic disease. The recurrence-free survival of 55 patients with gastric GIST was 30 months (range, 1-86).

Discussion & Conclusion:
GIST is an uncommon neoplasm and multidisciplinary care provides good outcomes. Laparoscopic approach is safe, feasible and oncologically efficient in the management of GIST.

CR-165

Embozene Microsperes (eTAE): An Alternative Agent for Transarterial Chemoembolisation in the Management of Hepatocellular Carcinoma

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Background & Hypothesis:
Combination tumour-targeted therapy in the management of hepatocellular carcinoma (HCC)—transarterial chemoembolisation (TACE) and radiofrequency ablation (RFA)—is a current clinical procedure employed to increase tumour ablation success rate. This study attempts to demonstrate that embolisation therapy with Embozene (eTAE) as compared to conventional TACE (cTACE) results in more precise tumour targeting and better postembolisation image quality.

Methods:
This multicentre retrospective cross-sectional study evaluates the sonography image quality change post-eTAE/cTACE. Fourteen pairs of tumour images were randomised for a point assessment by expert procedurists who were blind to the shuffling procedure. Five aspects were assessed: 1) echogenicity of the tumour, 2) tumour margin, 3) compression of surrounding tubular structures, 4) daughter nodules, and 5) overall impression of image quality change postintervention.

Results:
We observed meaningful improvement of image quality in tumour margin delineation (eTAE 1.70+/-1.46 and cTACE 0.49 +/-1.00 respectively; $P = 0.0162$) and overall improvement in image quality (eTAE 1.74+/-1.35 and cTACE 0.53+/-1.08; $P = 0.0141$). Good interobserver correlation was shown by intraclass correlation (ICC) [tumour margin 0.763 (95% CI, 0.582-0.878); overall impression (95% CI 0.535-0.868)]. The tumour size was a weak contributing factor to image quality.

Discussion & Conclusion:
We believe the study outcome demonstrates an improvement in the management of HCC especially in institutions without access to enhanced/guided imaging modalities. The use of eTAE results in better tumour delineation prior to RFA procedure which serves to increase the tumour ablation success rate.

CR-166

Effect of ECT Electrode Placement and Seizure Titration for Schizophrenia: A Report from a Large Public Psychiatric Institution

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Background & Hypothesis:
Electroconvulsive therapy (ECT) is an effective treatment for schizophrenia. However, the effects of modern forms of ECT in schizophrenia have not been well investigated. The aim of this study is to evaluate the effectiveness of different types of ECT in schizophrenia in the Institute of Mental Health (IMH) in Singapore.

Methods:
Over the past 2 years, ECT services in IMH transitioned from age-based to seizure-titration-based dosing, and also transitioned from bitemporal age-based ECT(BT-AB) to right unilateral seizure titration ECT(RUL-ST), bitemporal seizure titration ECT(BT-ST) to currently bifrontal seizure titration ECT(BF-ST). We included patients who were diagnosed with schizophrenia and who had received ECT in IMH from November 2014 to April 2016. Demographic characteristics, Brief Psychiatric Rating Scale (BPRS), Montreal-Cognitive Assessment (MoCA), and Clinical Global Impression (CGI) were analysed. Response to ECT was defined as $\geq 40\%$ reduction in the psychotic symptom subscale of BPRS and a post-ECT CGI-severity rating <3.

Results:
Ninety-nine patients participated; 62 had complete BPRS and CGI, of which 25 (40.3%) received BT-AB, 15 (24.2%) RUL-ST, 11 (17.7%) BT-ST, and 11 (17.7%) BF-ST; 14 (22.6%) met the response criterion. The mean total score of BPRS in each type of ECT decreased significantly after ECT (BT-AB: $15.36 \pm 13.22, P <0.001$; RUL-ST: 14.87 ± 14.87, $P = 0.002$; BT-ST: 13.00 ± 12.14, $P = 0.005$; BF-ST: 10.36 ± 15.36, $P = 0.049$). There were no significant differences in response rate, BPRS change and MoCA change between the 4 types of ECT.

Discussion & Conclusion:
ECT is an effective treatment option in patients with schizophrenia, and different types of ECT may have similar effectiveness. Further research to establish the relative efficacy of modern ECT in schizophrenia is recommended.

CR-167

Does the Influenza Vaccine Provide Year-Round Protection in the Elderly? A Systematic Review and Meta-Analysis

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Background & Hypothesis:
The influenza vaccine is less immunogenic in older than younger adults, and the duration of seroprotection is unclear. Determining if protection persists beyond a typical seasonal epidemic is important for Singapore where influenza virus activity is year-round.

Methods:
Peer-reviewed literature were searched systematically for studies reporting haemagglutination-inhibition (HI) titres 180-360 days following vaccination with seasonal influenza vaccine in adults aged ≥65 years. Seroprotection rates (HI titre ≥1:40) and geometric mean titres (GMT) were extracted. Study data were aggregated to estimate titre trajectories and compare prevaccination titres with postvaccination. Potential sources of bias were systematically assessed, and heterogeneity explored.

Results:
A total of 2864 articles met the inclusion criteria, and 19 met study inclusion criteria, of which 16 contained analysable data from 2565 subjects. In the Bayesian model, protection rates increased from 41%-51% prevaccination to 75%-78% at seroconversion. Seroprotection rate subsequently declined, sharply, falling below 60% for all serotypes by Day 360: A/H1 42% (95% CI, 38-46), A/H3 59% (54-63), B 47% (42-52). The GMT model demonstrated a similar pattern and by Day 360 titres were similar to prevaccination levels. No significant difference in seroprotection, 0 (-0.11-0.11) or log2GMT 0.30 (-0.02-0.63) was identified by Day 360 in the meta-analysis. The overall quality of evidence was moderate due to significant participant dropout from prevaccination to Day 360.

Discussion & Conclusion:
The review found consistent evidence to support the conclusion that protection following influenza vaccination does not reliably persist year-round in older adults. Alternative vaccination strategies could provide clinical benefits in Singapore and other tropical climates where year-round protection is important.

HPE-01

The Effectiveness of Structured Clinical Education on Pharmacist Competency Assessment Scores and Satisfaction with Training

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Background & Hypothesis:
At National Healthcare Group Pharmacy, pharmacists undertaking patient care activities must take an annual competency assessment. With no predetermined content for the assessment, pharmacists had expressed difficulty in their preparation. There were also requests for more clinical training. Implementation of structured clinical education should improve competency assessment scores and satisfaction with clinical training.

Methods:
Clinical education involved email dissemination of slides and journal articles for clinical topics at 6 to 8 week intervals. Self-assessment questions and corresponding answers were sent 4 and 5 weeks later respectively. Subsequent competency assessments were based on topics disseminated. The Friedman test was used to compare first and second year postimplementation assessment scores with pre-implementation scores. A satisfaction survey was administered 2 years postimplementation.

Results:
A total of 35 pharmacists took the competency assessments for 3 consecutive years and 46 pharmacists were surveyed. There was a statistically significant improvement in the scores over the 3 years ($P = 0.025$). Mean scores improved from 21.6 out of 30 (95% CI, 20.63-22.52) at baseline to 24.3 (95% CI, 23.38-25.31) and 26.1 (95% CI, 25.04-27.13) at first and second year postimplementation, respectively. Forty-two percent of pharmacists liked this method of training, 74% were satisfied with the training climate, 32% wanted to continue with this training method, and 33% wanted inclusion of clinical discussions.

Discussion & Conclusion:
Implementation of regular, structured clinical education improved pharmacists' annual competency assessment scores. More than half the pharmacists were satisfied with the new training climate. Addition of clinical discussions was requested

HPE-02

Is the Grass Greener? Feedback and Evaluation from the Other Side

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Background & Hypothesis:
The internal medicine (IM) residency program recognised that there was discordance between evaluations done by faculty and newly promoted senior residents (SR). While existing faculty had undergone training and calibration, we felt that we should prepare our graduating residents for the life of the evaluator.

Methods:
A 2-hour interactive workshop was formulated covering the following topics: The importance of evaluation; How to assess a junior—Workplace-based assessment and calibration; Teaching a skill; Giving feedback. Various modalities were used including videos, anonymised evaluations of a star performer and the struggling learner, and role play with "standardised residents". Final-year IM residents and newly promoted SRs were invited to attend. Participants were asked for feedback at the end of the workshop that included qualitative comments.

Results:
A total of 23 participants attended the workshop. The faciliators felt that the participants were engaged and vocal. A hundred percent of the participants agreed that the topics selected were helpful in improving their skills in evaluating the juniors and giving feedback; 96.7% felt that the workshop added to their knowledge and skills; and 95.7% of the participants felt that the format of the workshop was suitable for their learning needs and development.

Discussion & Conclusion:
Participants particularly enjoyed the videos and role playing and found them to be important to evaluating a learner according to their level. A majority commented that they found the matrix for giving feedback most useful and role playing with the standardised resident fun. We need to prepare residents for new roles that they have to take on.

HPE-03

Doctor, Can I Use Medisave for my MRI?

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Background & Hypothesis:
With rising healthcare costs, it is important for orthopaedic surgeons to have a good knowledge of healthcare schemes in order to counsel patients appropriately and provide cost-effective management. Our study explores the knowledge of healthcare schemes amongst orthopaedic residents.

Methods:
We sent out an electronic survey to all National Healthcare Group orthopaedic surgery residents. The survey included perception of the participant's knowledge of healthcare schemes followed by 14 questions on healthcare schemes. These questions covered whether Medisave can be used for outpatient CT/MRI scans, VAC therapy, outpatient hyperbaric oxygen therapy and also qualification criteria and subsidy levels for Community Health Assist Scheme (CHAS) and Pioneer Generation Package (PGP) card holders.

Results:
A total of 26 out of 33 (78.8%) residents took part in the survey. The participants' perception of their knowledge of healthcare schemes were mainly average to poor (24) with 2 who felt that it was good. For the 14 questions, junior residents scored an average of 36.6% and senior residents, 19% with a combined score of 29.7%. There was no significant difference between the 2 groups.

Discussion & Conclusion:
The majority of residents felt that their knowledge of healthcare schemes to be poor. Senior residents have a poorer score but no statistically significant difference was found between them and the junior resident group. These findings suggest a need for greater awareness of healthcare schemes which should be integrated into the residency programme to bring about more cost-conscious clinicians and better informed patients.

HPE-04

The Role of Mentoring in Orthopaedic Surgery Residency

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Background & Hypothesis:
In our institution, mentors are assigned to residents throughout their 6-year programme. However, there are no clearly defined objectives in the mentoring scheme leading to potential variation in the mentees' experience. Our study aims to assess residents' perception of the scheme and obtain feedback on how to improve.

Methods:
An electronic survey was sent to all 32 residents within our residency programme.

Results:
A total of 19 residents completed the survey (59% response rate). Sixteen (84.2%) of the residents felt that mentoring was an important part of the residency programme; 52.6% felt that mentors were very to extremely beneficial in aiding their career decisions, providing networking opportunities, supporting their educational experience and contributing to their professional development; 52.6% felt that mentor meetings were extremely to very beneficial; 26.3% somewhat beneficial and 21% minimally to not at all beneficial. Out of those surveyed, 47.4% felt that mentoring should be required and monitored, 26.3% required but not monitored and 26.3% exempted as a requirement and arranged on a personal basis if desired. Approachability, good reputation and being able to create an ideal practice environment were regarded as very important by majority of the residents. Most of the residents also regarded as extremely important their mentors' role in career guidance, personal development and providing networking for fellowship.

Discussion & Conclusion:
Residents mostly feel that mentorship is an important part of their residency but have mixed experience of the benefits. This study suggests the need to standardise the scheme's objectives in order to improve the experience for both mentors and mentees.

HPE-05

Resilience Factors in Junior Doctors Working in a Psychiatric Hospital: A Qualitative Study

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Background & Hypothesis:
The study aimed to explore ethnographic features and iterative themes predicting self-reported resilience in junior doctors from various cultural backgrounds. Physician resilience, stress appraisal, coping, professional strain and efficacy, and burnout are increasingly coming into public consciousness in managed healthcare systems. Specific research looking at resilience in junior doctors in psychiatry is, however, sparse.

Methods:
Participants for the study, which was endorsed by the institutional ethics board, were recruited from a tertiary psychiatric hospital. Semi-structured interviews were administered, which were then transcribed, de-identified and thematically analysed by 2 researchers. Information gathered was then presented to a focus group for corroboration and clarification.

Results:
A total of 30 medical officers completed the study, with mean age of 29.5 years. Sixty percent of participants were locally trained, with each having an average work experience of 4.9 years. Self-resilience was generally scored higher than group-resilience, and controlling for age, place of training, and duration of experience postgraduation and duration of practice in the local system were significantly associated with self-reported resilience. Self-identified resilience factors included internal factors such as communication skills, competence, personality style, time management skills, experience, positive attitude and knowledge; external factors such as friends and family; and lifestyle factors such as leisure, exercise and religion.

Discussion & Conclusion:
The qualitative thematic findings of this study are consistent with existing research looking at physician resilience. With the globalisation of training and the rise in immigrant physician populations, experience in a local system is hypothesised to facilitate resilience via acculturation.

HPE-06

Transition to Clerkship – How Involved are Medical Students during Ward Rounds?

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Background & Hypothesis:
The ward round is rich with clinical material. Inexperienced students—who lack professional socialisation skills—often struggle to take advantage of this learning platform. In this study, we described the interaction dynamics of medical students in the ward rounds of their first clerkship posting. By understanding the strengths and weaknesses of the students' social network, we identified interventions that can improve their participation in ward rounds.

Methods:
This was a field observation of medical students in the ward rounds of their first clerkship posting. Trained independent observers recorded the direction and duration of interactions that occurred during the ward round. Data collected was evaluated with social network analysis. This generated network diagrams that described the socialisation patterns of members within each ward round.

Results:
Nine students were observed in 8 different ward rounds. They were passive observers who isolated themselves and directed most of their attention to study aids, fellow students, and ward computers. Their interaction with doctors and patients were limited. They were spoken to mostly by the consultants.

Discussion & Conclusion:
Prevailing research suggest that the students' passive behaviour is due to deficits in clinical knowledge and professional socialisation skills. Preclerkship training may help to rectify these deficiencies. Consultants, as natural leaders in the ward rounds, must be trained to facilitate greater student participation and patient interaction. A flipped classroom approach and a checklist of ward round objectives, will encourage proactive, goal-oriented behaviour. In conclusion, new education strategies are needed to stimulate effective learning from inexperienced medical students during ward rounds.

HPE-07

Conscientiousness Index from the Perspective of the Programme Administrators

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Background & Hypothesis:
Professionalism is one of the core competencies and an integral part of residency training. Residents often relate professionalism with their conduct and practice in clinical areas, and consequently, overlooked their responsibilities in administrative and learning tasks. While professionalism in clinical areas is regularly monitored and evaluated using various assessment tools, professionalism in administrative tasks do not have formal assessment. With the implementation of Conscientiousness Index (CI), we aimed to emphasise to the residents that conscientiousness in administrative tasks is an integral part of their training and professionalism.

Methods:
The NHG IM Residency CI was devised based on administrative and learning tasks that residents need to complete as part of training requirements. These tasks, which are regularly monitored by the programme administrators, included: attendance at teaching activities, submission of administrative data and evaluations, as well as uncategorised events. The CI has been implemented since 2013 and forms part of the residents' evaluation of professionalism.

Results:
There has been an upward trend in the CI scores since implementation. We feel that the implementation of CI has helped with the collation of residents' assessments and administrative data. Residents now view submission of administrative and learning tasks as part of their professionalism and training. The use of scalar measure of conscientiousness had also helped us flag potential problem residents to faculty in a timely manner.

Discussion & Conclusion:
We feel that there has been a change of residents' perception of professionalism as including administrative tasks. Assessment drives learning, and it appears that this holds true even in administrative tasks.

HPE-08

Task Trainer Simulation Training – A New Curriculum for National Healthcare Group Internal Medicine Residency Programme

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Background & Hypothesis:
Supervised procedural training is an essential component of residency training. Differing clinical opportunities among residents have led to a lack of standardisation in the training of practical procedures. We believe that simulation-based training can standardise learning and improve residents' procedural skills and confidence.

Methods:
The residency programme has initiated quarterly task trainer sessions for internal medicine residents since 2012. The sessions comprised lumbar puncture, knee aspiration, abdominal paracentesis and thoracocentesis stations. Upon completion of the session, feedbacks were gathered via a questionnaire and the effectiveness of individual facilitators, together with overall effectiveness of learning experience, was obtained.

Results:
A total of 182 residents had participated in the sessions and 154 (86%) residents provided feedback. Almost all of the residents (97.4%) felt that the format of the session was effective and 149 (96.8%) residents agreed that the overall session was useful for improving their patient care skills. A total of 160 (88.3%) residents agreed that all the procedures were useful. The positive feedbacks were primarily on: opportunities for hands-on practice (46/99; 46.5%), the presence of good tutors (20/99; 20.2%), small group size (8/99; 8.1%), use of checklist (6/99; 6.1%), and organisational efficiency (5/99; 5.1%). There were strong requests for simulation on bone marrow biopsy and chest tube insertion.

Discussion & Conclusion:
Simulation-based procedural training curriculum is shown to be well received among the residents. The opportunity for hands-on practice and good tutors are the key elements to a successful task trainer session. An unintended consequence of collecting feedback is identifying learning gaps and monitoring the effectiveness of intervention at addressing learning needs.

HPE-09

Tri-Generational Homecare Project: The Effect of a Student-initiated Homecare Programme on Ageism and Interpersonal Skills among Undergraduate Healthcare Students

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Background & Hypothesis:
This study investigates the effectiveness of Tri-Generational Homecare Project (TriGen) in reducing ageism amongst a cohort of medicine, nursing, pharmacy and social work undergraduates at National University of Singapore, and equipping them with interpersonal skills and awareness of healthcare issues.

Methods:
TriGen is a student-led, professionals-supported programme complementing Khoo Teck Puat Hospital's Ageing-in-Place programme, a community-based healthcare programme targeting frequently admitted patients. Participants underwent training on misconceptions towards older persons and how to care for them, then, in interdisciplinary groups of 2 to 3, conducted home visits to at-risk elderly over 6-months and collaborated with AIP professionals at 2 multidisciplinary meetings. Participants completed Kogan's Attitudes towards Old People Scale (KOP) at the baseline and 6-months, and Fund for the Improvement of Post-Secondary Education (FIPSE) Survey Instrument at 6-months. Statistical analysis was performed using SPSS v23.0.

Results:
KOP scores (response rate: 83.3%; n = 45; mean age, 21.5; 66.6% female) significantly increased from 134.7 ± 12.8 to146.1 ± 14.5 (95% CI, 142.3-151.8; *P* <0.001). Higher scores imply less ageism, with 102 being neutral. For all 22 aspects surveyed in the FIPSE survey, >70% of respondents agreed that TriGen has helped them; 93.3% agreed that TriGen has helped them to think of others and 91.1% felt that TriGen has helped them to feel responsible for others in the community and appreciate teamwork and cooperation among peers.

Discussion & Conclusion:
After 6 months of participating in TriGen, students have significantly reduced ageism and are more thoughtful, empathetic and socially aware. A structured experiential service-learning approach thus appears to be a promising platform for reducing ageism and improving interpersonal skills and awareness of healthcare issues amongst future health professionals.

HPE-10

"Do You See What I See?" – The Use of a Teamwork Evaluation Tool to Determine Differences in Perception of Team Performance in an Integrated Resuscitation Drill Exercise (IRDE)

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Background & Hypothesis:
The Integrated Resuscitation Drill (IRDE) caters for newly joined doctors and is an integral part of the hospital's patient safety practice. The doctors take the opportunity to interact with nurses in the aim of reviving a simulated collapsed patient during the IRDE. The IRDE provides a safe environment to hone Crisis Resource Management (CRM) skills such as leadership, problem solving, situational awareness and inter-professional communication—all of which are important in a successful resuscitation. Perceptions on team performance may vary between doctors, nurses and instuctors during the IRDE, and the authors explored if there are variations within these groups.

Methods:
A group consisting of 2 facilitators (registrar/consultant and nurse educator), 4 doctors, and 3 nurses was involved in this simulation exercise. In each resuscitation scenario, 2 doctors work with 3 nurses while being observed by the facilitators. Each pair of doctor will go through 2 resuscitation scenarios. The Kid SIMulation (KidSIM) Team Performance Scale was used as tool, whereby facilitators rate the doctors, while the doctors and nurses rate their own team performance. Krippendorff's alpha coefficient was used to calculate inter-rater reliability.

Results:
Facilitators and nurses have moderate agreement (alpha 0.4176) of ratings in perception of team performance, while facilitators and doctors have poor agreement (alpha -0.959) of ratings.

Discussion & Conclusion:
The KidSIM Team Performance Scale can be used as an objective measure ("scorecard") of the CRM domain of the IRDE. The scale tool demonstrated that doctors' self-assessment of team performance may differ from nurses and the facilitators, as nurses have higher expectations for doctors to exhibit leadership, clarity of decision-making, and prompt task delegation.

HPE-11

Seeking Equilibrium: Intra-Role Conflict in Palliative Care

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Background & Hypothesis:
Despite increased awareness and education in end-of-life issues, psychosocial aspects of palliative care such as alleviating the emotional suffering of patients and relatives remain daunting to junior doctors. Specifically, we aimed to understand the intra-role conflict that occurs in the need to manage personal emotions and professional behaviour, and how junior doctors cope with this.

Methods:
Seven focus groups were conducted with 21 junior doctors from June 2013 to January 2014 who completed their palliative postings in a tertiary hospital and an inpatient hospice. The transcripts were analysed using qualitative content analysis to identify the themes associated with intra-role conflict.

Results:
Our analysis was guided by Lewin's (1951) field theory to understand how opposing "forces" interact and maintain within a field, in the search for optimal balance. The need to provide holistic care to the dying, which includes psycho-emotional support was associated with increased tension on a doctor. They faced internal conflict on: 1) compassion fatigue, 2) difficulty in distancing, and 3) prognostication uncertainty. Counter tension themes supporting conflict resolution include: 1) reframing of mindset, 2) development of clinical empathy, and 3) learning from role models.

Discussion & Conclusion:
Balancing personal emotions and professionalism may result in tension, but homeostasis may be achieved when one is cognisant and discerning of the various tensions present in a situation and able to draw on learning from role models to maintain equilibrium.

HPE-12

Communications for Residents: Their Perceptions and Needs

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Background & Hypothesis:
Excellent physician communication skills (physician-to-patient and patient-to-physician) have been found to have a positive impact on patient satisfaction and may positively affect patient health behaviours and health outcomes. Our study aimed to explore the residents' self-perceived competency in various communication skills and identify factors affecting their self-rated competency.

Methods:
This cross-sectional study surveyed Phase 1 and 2 residents in a tertiary hospital. Residents rated their competency in various communication topics using a 5-point Likert scale (5 = very comfortable, 1 = extremely uncomfortable). Stata was used for data analysis.

Results:
A total of 213 out of 359 (59.7%) residents participated in the survey. Communication topics which residents faced difficulty in included end-of-life (EOL) discussions, managing difficult and angry patients/relatives, breaking bad news, advance care planning (ACP), communications on medico-legal implications and coroners cases. Factors which enhanced residents' self-rated competency included longer working experiences, more years in residency training, attendance of communication courses and palliative care rotation. Topics that residents wanted to be trained in included EOL and extent of care discussions, medico-legal issues, managing difficult interactions, breaking bad news, open disclosure and ACP. Learning methods which residents view as effective included role play with feedbacks from facilitators/participants, use of standardised patients, use of relevant clinical case scenarios that mirrored work environment and precourse e-learning videos.

Discussion & Conclusion:
This study will help educators improve on educational initiatives to equip doctors with the necessary communication skills to support patients and their families in a professional manner.

HPE-13

Online- and Local Area Network (LAN)-based eLearning Interventions for Medical Doctors' Education – A Systematic Review

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Background & Hypothesis:
Online and LAN-based education has grown in popularity; research has shown the scope of this technology and its role in training medical doctors. This systematic review assesses the effectiveness of online and LAN-based eLearning interventions compared other types of learning in medical doctors' education.

Methods:
We performed a systematic review of articles published from 1990 on online- and LAN-based eLearning for medical doctors' education. We searched 8 major bibliographic databases for randomised, cluster-randomised controlled trials and quasi-randomised studies. Two review authors independently screened citations, extracted data and assessed the risk of bias based on the guidance from the Cochrane Handbook for Systematic Reviews of Interventions.

Results:
The review included 76 studies involving 21,764 participants. The interventions in the included studies were diverse: 49 studies compared eLearning vs traditional learning, 12 studies compared eLearning vs another type of eLearning, 3 studies compared eLearning vs blended learning, and 12 studies compared blended learning vs traditional learning. Twenty-six studies reported eLearning was better in terms of knowledge gain, 7 studies reported that eLearning was better in terms of skills acquisition, 2 studies reported that eLearning was better in terms of learners' attitude, and 6 studies reported that higher learners' satisfaction with eLearning when compared to traditional learning.

Discussion & Conclusion:
Online- and LAN-based eLearning and blended learning significantly improved learners' knowledge, skills, attitudes and satisfaction. However, the overall quality of evidence was low for all outcomes, and is limited to occupational physicians, emergency medicine physicians, anaesthesiologists, obstetrics and gynaecologists, radiologists, radiation oncologists, urologists, orthopaedicians, public health specialists, and gastroenterologists.

HPE-14

Psychiatric Teaching and Clinical Exposure among Nursing Students in Singapore: Relation to Mental Health Literacy and Likelihood of Choosing Psychiatric Nursing as a Career Choice

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Background & Hypothesis:
This study aimed to explore the mental health literacy (MHL) among nursing students on 3 most prevalent mental problems in Singapore—major depressive disorder, alcohol abuse, obsessive-compulsive disorder—along with other debilitating conditions such as schizophrenia and dementia. The impact of psychiatric teaching and placement on students' ability to identify these disorders, as well as their willingness to specialise in psychiatric nursing given the low recruitment to the field, were also examined.

Methods:
Cross-sectional data was collected from 400 students across 3 local nursing institutions. MHL was examined using a vignette approach through random assignment of the 5 disorders. The involvement of students (yes/no) in 3 mental health-related activities namely lectures, small-group teachings and clinical placement, along with the perceived quality (poor/below average/average/above average/good) of each activity among those who participated, were assessed.

Results:
The correct recognition rates for the above disorders were 88.9%, 58.1%, 87.8%, 43.9% and 85.2% respectively. Though not statistically significant ($P = 0.055$), those who had attended lectures were more likely to identify the assigned psychiatric disorder correctly than those who did not after controlling for vignette type and psychiatric activities attended. Only students' perceived quality of any of the 3 activities attended, but not the mere involvement, had an influence on their intent to specialise in psychiatric nursing, using chi-square analyses.

Discussion & Conclusion:
The role of psychiatric teachings and placement within nursing schools is important in shaping the field of psychiatric nursing in Singapore in areas of both knowledge and recruitment. Education on schizophrenia as a disorder may need to be improved.

HPE-15

Stigma towards Mental Illness and Level of Training within Psychiatry Residents

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Background & Hypothesis:
Psychiatry as a discipline has been associated with stigma in both healthcare providers and learners. Thus, identifying factors leading to stigma is important for developing measures to improve attitudes towards mental illness in psychiatry residents. Based on previous findings, levels of stigma are hypothesised to correlate with years in psychiatry residency, perception of learning environment (LE), stress and burnout levels, with the latter two being associated with resilience.

Methods:
Perceptions of LE, resilience, stigma towards mental illness, stress and burnout levels were measured in 67 psychiatry residents across 5 residency years using the PHEEM, BRS, OMS-HC, PSS and OBI, respectively. Gender and residency year were compared on the above variables using t-test and one-way ANOVA, and correlation between the variables was studied.

Results:
Self-reported stigma towards mental illness was 45.84 ± 0.790. Stigma level did not differ between genders but differed between residency year ($F_{4,61} = 2.96$, $P < 0.05$). First-year residents reported lower stigma than second- and fifth-year residents, and third-year residents reported lower stigma than fifth-year residents (all $P < 0.05$). Stigma level did not correlate with the perception of LE, resilience, stress, and burnout levels. Stress and burnout (disengagement and exhaustion) negatively correlated with resilience.

Discussion & Conclusion:
While our cohort of psychiatry residents reported overall low stigma levels towards mental illness, stigma levels increased in higher residency years, implying that measures should be taken early to improve residents' attitudes towards mental illness. Residents' perceptions of LE and stress and burnout levels were not associated with their attitudes towards mental illness.

HPE-16

The Professional for Tomorrow's Healthcare (PTH) Model – Aligning Psychiatry Residency Training with Future Needs

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Background & Hypothesis:
The National Healthcare Group (NHG) Education Office, in consultation with healthcare educators and practitioners in Singapore, has devised a model encapsulating key attributes needed for the professional for tomorrow's healthcare (PTH). The model may be summarised as: PTH = E (K1+K2+F+L), where E represents ethics and professionalism, K1 represents core professional capabilities, K2 represents cross-cutting skills, F represents future-oriented thinking and L represents distributed leadership. While there have been reports recognising the need for these last 2 capabilities, few articulate and evaluate these competencies in medical curricula.

Methods:
This study was performed in consultation with the Department of Psychological Medicine, Tan Tock Seng Hospital, to evaluate the current status of psychiatry resident training with regard to the capabilities in the PTH model. A multimethod approach to curriculum evaluation was used, including reviewing the curriculum documentation for the residency programme, and interviews with faculty.

Results:
While professionalism (E), core professional knowledge (K1) and systems thinking (one aspect of K2) are well represented in learning objectives during the early years of the programme, the development of capabilities emphasising F and L were not readily apparent. Interviews with faculty showed that these competencies are present in the later years but constitute a hidden part of the curriculum.

Discussion & Conclusion:
The evaluation showed that while future-oriented thinking and distributed leadership are acknowledged as important for 21st century practice, these are not yet explicit learning objectives in the current curricula. Work is in progress to explore opportunities to incorporate these competencies into future curricula.

HPE-17

Supporting Research and Innovation among Students at NUS Medicine – How Fellow Medical Students Play a Role

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Background & Hypothesis:
The Wong Hock Boon Society is a student-led research society at the National University of Singapore's Yong Loo Lin School of Medicine (NUS YLL SoM) that leads a range of events and initiatives to support student-based research and innovation. The NUS Medical Society's Research Directorate is another student organisation that promotes and supports medical student participation in research.

Methods:
This abstract and poster will discuss the initiatives led by the 2 key student organisations in promoting and supporting medical student involvement in research and innovation at NUS Medicine. The range of events and programmes organised by the student organisations are reviewed.

Results:
Student-led initiatives that support student participation in research are: 1) research project matching, 2) flagship events, 3) workshops and courses in research and innovation, and 4) funding support. Research projects from all major hospitals are available to students for matching through the student organisations on a once-monthly basis. Flagship student research events include the Wong Hock Boon Society Symposium and the NUS Medical Grand Challenge, a university-wide medical innovation challenge. Workshops organised include 2 biostatistics courses and 1 molecular biology techniques workshop. Funding support includes a $700 personal grant available to Wong Hock Boon Society members, a $2000 Research Fellowship available to 3 students yearly, and 50% conference funding support through the Dean's Office (Student Affairs).

Discussion & Conclusion:
Fellow students play an active role in supporting research and innovation at NUS Medicine. These initiatives and events may offer insights and collaboration opportunities for hospitals and other medical schools in supporting research and innovation.

HSR-01

Psychosocial Determinants of Healthcare Staff's Perceived Need to Improve Hand Hygiene Compliance

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Background & Hypothesis:
Hand hygiene prevents healthcare-associated infections, but compliance among healthcare staff is suboptimal. We evaluated psychosocial factors associated with hospital staff's perception on their need to improve on their hand hygiene compliance in routine patient care.

Methods:
We conducted a cross-sectional study in a 1500-bed tertiary-care hospital in Singapore, using a self-administered questionnaire with 36 items, each on a 5-point Likert scale. Principal components analysis was performed to derive the latent factor structure which was later applied in the multivariable logistic regression analyses.

Results:
Of 1064 staff, nurses (67.1%) were significantly more likely to perceive the need to improve on their hand hygiene compliance than allied health professionals (AHPs) (18.8%) and physicians (14.1%) (P <0.0001). Seven psychosocial factors were identified, with Cronbach's alpha for scales between 0.33 and 0.86. After adjusting for positive knowledge, attitudes, and behaviours toward hand hygiene, perceived barriers to hand hygiene, preference for alcohol handrubs, and feelings of embarrassment if reminded about hand hygiene, senior staff (OR: 3.33; 95% CI, 1.26-8.80), nursing staff (OR: 2.94; 95% CI, 1.12-7.74), having personal motivators and enablers for hand hygiene (OR: 1.52; 95% CI, 1.03-2.26) and having the need for external reminders (OR: 1.59; 95% CI, 1.11-2.28) were positively associated with the perceived need to improve on personal hand hygiene compliance. Males (OR: 0.40; 95% CI, 0.15-1.07) were less likely to perceive the need for improvement.

Discussion & Conclusion:
Senior staff and nurses could be facilitators in their healthcare teams who motivate others to improve on hand hygiene compliance during routine patient care.

HSR-02

Depressive Symptoms and Suicidal Ideation among Youths in Singapore

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Background & Hypothesis:
Depression is the most common mental disorder in Singapore. Studies have found that depression affects 5.8% of the adult population in Singapore. Previous researchers have also strongly associated depression with suicidal ideation. However, little is known about the prevalence of depressive symptoms and suicidal ideation in youths. Depression is a largely unrecognised problem among youths. Depressive symptoms are often attributed to normal stress and misdiagnosed as attentional or conduct disorders in youths. Early recognition of depression is essential to reducing the prevalence of depression and suicidal ideation/attempts among youths. Thus, this study aimed to investigate on the prevalence of depression and examined the relationship between depression symptoms and suicidal ideation among youths.

Methods:
A total of 180 participants within the age group of 15 to 22 were recruited from Ngee Ann Polytechnic. Participants completed a demographic questionnaire and self-reported measures that examined depressive symptoms and suicidal ideation. This study was approved by the human research ethics committee.

Results:
Thirty-seven percent of the youths reported symptoms of depression. A higher proportion of females reported depressive symptoms than males. Further, results revealed that depression symptoms were strongly associated with suicidal ideation.

Discussion & Conclusion:
This study provides evidence that depression is highly substantial and a largely unrecognised problem among youths. It further highlights that youths experiencing depressive symptoms are more prone to suicidal ideation. Thus, more education and intervention efforts are needed for youths in schools (example, the polytechnic population). Increased awareness of depression among this age group would be important for the recognition and treatment of depression in youths.

HSR-03

Evaluation of the Virtual Hospital Programme at Tan Tock Seng Hospital – Interim Results

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Background & Hypothesis:
Patients with frequent hospital admissions have a disproportionately greater share of healthcare utilisation and expenditure. To reduce avoidable admissions by patients at high risk of readmissions, Tan Tock Seng Hospital initiated the VH programme which provides multidisciplinary case management and holistic care integration. This report presents interim evaluation results for patients screened between April and August 2014.

Methods:
This was a retrospective cohort study of 349 patients with 3 or more admissions in the past year and screened as eligible for the Virtual Hospital (VH) programme using predefined criteria. Eligible patients were classified into 2 groups based on enrolment status and followed up for 1 year. Healthcare utilisation, mortality and gross cost were compared between the 2 groups using generalised linear models (GLM), controlling for demographics, comorbidities and baseline admissions.

Results:
Those enrolled (n = 92) had more males (69.6% vs 54.5%) and were older than those not enrolled (n = 257; age ± SD: 72.9 ±11.0 vs 68.1 ± 15.3). Results of GLM revealed that during 1 year of follow-up, those enrolled had 17% fewer admissions (incidence rate ratio (IRR) = 0.83; 95% CI, 0.72-0.96), 13% more Specialist Outpatient Clinic (SOC) visits (IRR = 1.13; 95% CI, 1.06-1.20) and 39% more polyclinic visits (IRR = 1.39; 95% CI, 1.19-1.61), and lower mortality rate (OR: 0.35; 95% CI, 0.16, 0.73). No significant difference was found in cumulative length of stay, emergency department visits and gross cost.

Discussion & Conclusion:
Interim results suggest favourable programme effects on hospital admissions and mortality, as well as greater SOC and polyclinic visits. It will be beneficial to explore other outcomes such as patient experience, improvement of empowerment and quality of life.

HSR-04

Engaging the Severely Mentally Ill in Singapore: Evaluation of a Pilot Supervision Programme (PSP) – A Home-based Psychosocial Rehabilitation Programme Reinforced by Financial Incentives

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Background & Hypothesis:
Adherence problems are an inherent issue with any bio-psycho-social-spiritual prescription for any disease entity, in particular with severe mental illnesses (SMI). Interventions such as compliance therapy, family and psychoeducational interventions, telephonic prompting and also legislative measures like Community-Treatment-Orders (CTO) have to date shown inconsistent and only modest benefits. This paper addresses whether incentive-based psychosocial rehab programmes are beneficial in engaging SMI sufferers in Singapore.

Methods:
The Institute of Mental Health has implemented a Pilot Supervision Programme (PSP) that incentivises patient engagement through quarterly vouchers alongside minimising barriers by waiving off certain treatment fees whilst also offering them home-based intervention for 1 year. High-risk patients with diagnosis of severe mental illness needing involuntary admission with history of either prolonged (>30days) or repeated admissions (>3/year), have been recruited since October 2012. The comparison was done between 12 months pre- and post-intervention phase.

Results:
A total of 167 patients (95% suffering from schizophrenia or schizoaffective disorder) were accepted into the treatment programme and 153 out of 167 completed 12 months intervention. The outcome findings are promising with significant reduction in the number and duration of hospital stay in the subsequent 12 months along with significant reduction in unplanned visits to our Emergency Department compared to pre-intervention phase.

Discussion & Conclusion:
The positive findings support the use of an incentives-based approach in Singapore. Long-term studies and comparison with the group that refused consent to participate in such intervention will shed more light into the effectiveness of such interventions.

HSR-05

Illness Perceptions among Psychiatric Outpatients and its Association with Sociodemographic Characteristics

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Background & Hypothesis:
Illness perceptions (beliefs relating to how individuals make sense of and understand their health status) have not been studied extensively among those with mental health problems. This study aimed to examine illness perceptions and its sociodemographic associations among individuals with mental illnesses.

Methods:
A total of 250 patients were recruited at the Institute of Mental Health − a tertiary psychiatric hospital in Singapore. The Illness Perception Questionnaire Mental Health (IPQ-MH) comprised of three parts: identity (experiences of symptoms), structure (timeline of illness, consequences, personal and treatment control, understanding and emotional response to illness) and causes. ANOVA and multiple linear regression analyses were conducted to determine the associations.

Results:
Items were endorsed differently by those with different diagnoses, gender, and marital status. Individuals with schizophrenia and related psychoses were less likely to describe their condition as being chronic and cyclical, having a negative impact on their lives, or report negative emotions to their illness. Malays were more likely to perceive their illness as having a serious impact on their lives, while Indians reported greater understanding of their illness. Those who were married felt that their illness could be controlled with treatment while those who were separated/divorced/widowed were more likely to believe that their illness was due to stress-related causes.

Discussion & Conclusion:
Findings suggest that illness perception varies across patients with different diagnosis, ethnicities and by marital status. Planning of psycho-education programmes must take these differences into consideration to deliver more personalised care to patients.

HSR-06

Acute Hospital Transfers from Tan Tock Seng Hospital Rehabilitation Centre

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Background & Hypothesis:
Tan Tock Seng Hospital Rehabilitation Centre (TTSH RC) admits patients for comprehensive rehabilitation. This study aimed to examine complications developed by our patients which necessitated transfer out to acute hospitals, in order to reduce these rates and associated healthcare costs.

Methods:
We conducted a retrospective review of medical records of TTSH RC patients transferred to acute hospitals between January and December 2014.

Results:
In 2014, there were 116 transfers to acute hospitals, involving 97 patients with a mean age of 60.3 years (± 15.1 years). These comprised 10.4% of all admissions to TTSH RC. The majority were admitted for stroke (56.9%) and acquired brain injury (13.8%), and were transferred to the acute hospital for emergent reasons (85.3%). The most common reasons for transfer were new stroke (18.1%), urinary tract infection (9.5%), pneumonia (9.5%) and seizures (4.3%). The majority of transfers were due to neurological conditions (28.3%) and infections (22.5%). Other reasons include gastrointestinal conditions (10.8%) and cardiorespiratory conditions (10.0%); 12% and 34.5% of the transfers occurred within 48 hours and 7 days of the patient's admission to TTSH RC respectively. Of the patients transferred out, 58.6% were readmitted back to TTSH RC, and 66.2% of them were subsequently discharged home after completing their rehabilitation programme.

Discussion & Conclusion:
The TTSH RC rate of transfer to acute hospitals was similar to other studies (9.2% to 17.9%). Many readmissions occurred within 7 days of transfer to RC. There are plans for further research analysis of this group of patients to identify the possible reasons and risk factors.

HSR-07

Economic Cost for Transfemoral and Transtibial Amputee Patients in Singapore Requiring Outpatient Prosthetic Care and Rehabilitation: A Retrospective Study One Year Postamputation

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Background & Hypothesis:
With the growing epidemic of type 2 diabetes and its complications such as limb amputation, economic burden to the individual and society will increase. Funding models for outpatient care has evolved to help reduce direct cost to patients who require long periods of outpatient rehabilitation. An additional burden would be the cost of suitable prosthesis in order for amputees to regain mobility and return to gainful employment. This study investigates the estimated direct cost for outpatient prosthetic care and rehabilitation for transfemoral and transtibial amputees in Singapore.

Methods:
Retrospective data was extracted from patients referred to Foot Care & Limb Design Centre for prosthetic care and rehabilitation. Inclusion criteria included single transfemoral or transtibial amputation done in 2014, fitted with category K2-level prosthesis and completed physiotherapy rehabilitation within one year postoperative. Exclusion criteria included no major complications, incomplete rehabilitation sessions or mortality.

Results:
Out of 80 patients reviewed, 31 met the criteria. The average total cost were SGD 154.21 (rehabilitation physician), SGD 3644.98 (prosthetics) and SGD 581.20 (physiotherapy); with an average outpatient total cost of SGD 4306.70. The average out-of-pocket cost for a patient receiving a K2-level prosthesis was SGD 2737.

Discussion & Conclusion:
Cost estimation of decreased productivity, non-participating in labour force due to employment loss, inpatient stay, surgery, transport and future prosthetic replacement costs were not investigated. As such, the total economic burden to an amputee patient and society would be far larger. Outpatient funding may require further augmentation to ensure amputee patients have means to receive their prosthesis and attend rehabilitation in order to be functional again.

HSR-08

Validation of the Clutter Image Rating (CIR) Scale among Psychiatric Outpatients in Singapore

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Background & Hypothesis:
Hoarding disorder is characterised by persistent difficulty discarding or parting with possessions −
such behaviour can be detected by examining the amount of clutter accumulated by the individual at
home. The Clutter Image Rating (CIR) scale, which has been widely used but validated only in
Western countries, can be used to assess the severity of such clutter. This study aimed to validate the
CIR scale among psychiatric outpatients in Singapore.

Methods:
Data was collected from a study assessing hoarding behaviour among 500 outpatients seeking
treatment at the Institute of Mental Health. Convergent and divergent validity were established from
correlations between CIR (composite and corresponding rooms − living room, bedroom and kitchen)
with other hoarding and non-hoarding measures (BAI, BDI, Q-LES-QSF). Two trained interviewers
visited houses of 46 participants and separately rated the rooms using the CIR to test for inter-rater
reliability.

Results:
Correlations between the CIR composite and hoarding-related measures were moderate (r = 0.42 to
0.54), while correlations were weaker (r = -0.24 to 0.25) with non-hoarding related measures. The
degree of agreement between the two interviewers' ratings for corresponding rooms were moderate
(Cohen's kappa = 0.37 to 0.51). The interviewer rated and participant rated CIR for corresponding
rooms correlated moderately (r = 0.41 to 0.61). All correlations were significant at $P \leq 0.05$.

Discussion & Conclusion:
The CIR exhibited convergent and divergent validity, demonstrating that it assesses the intended
construct of clutter. In addition, the significant inter-rater statistics suggest that the CIR is reliable and
can be used in Singapore, although it could be improved to achieve an even more accurate rating.

HSR-09

Designing a Care Bundle to Assess and Treat Osteoporosis among Older Persons with Mental Illness in a Tertiary Psychiatric Hospital

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Background & Hypothesis:
The risk of osteoporosis increases with age. It is further aggravated in older persons with mental illness due to home-bound lifestyle, poor nutritional intake from cognitive impairment, and hyperprolactinaemia and hyperparathyroidism from psychiatric medications. Although osteoporosis causes adverse outcomes, it has received little attention in psychiatric settings. In this pilot study, we tested the feasibility of creating a care-bundle to assess and treat osteoporosis among older persons in a tertiary psychiatric hospital.

Methods:
Using qualitative methods, we drafted an osteoporosis assessment and treatment bundle, with input from osteoporosis specialists, psycho-geriatricians, pharmacists, nurses and administrators. We determined the key components in the bundle using the Ishikawa diagram and Pareto principle. We then refined the bundle using plan-do-study-act principles, with feedback from ground staff, patients and caregivers.

Results:
We produced a care-bundle comprising: simplified assessment and treatment processes, onsite Bone Mineral Density test (BMD) and osteoporosis medications at subsidised cost, and educational leaflets on non-pharmacological interventions. We piloted the bundle in two geriatric wards – 268 patients were assessed and 62% identified as moderate-high risk according to a brief tool, Osteoporosis Self-Assessment Tool for Asians (Age-Weight >0). Among this moderate-high risk group, 23 agreed for BMD, with 61% having osteoporosis. The bundle was well received by ground staff and administrators, and accepted by the other geriatric wards for implementation.

Discussion & Conclusion:
Osteoporosis is common in older persons with mental illness. It is feasible and worthwhile to implement an osteoporosis care-bundle for older persons with mental illness. Such an approach maintains patients' quality of life and is consistent with the geriatric principle of holistic care.

HSR-10

Methicillin-resistant *Staphylococcus Aureus* Infections Risk Stratification of Khoo Teck Puat Hospital Admissions

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Background & Hypothesis:
The project aims to improve patient safety via early interventions on patients at high-risk of MRSA colonisation upon admission. KTPH is practising universal screening of MRSA upon patients' admission. With this infection control policy, in total about 75% of admissions were administered with MRSA tests. Therefore, 25% admissions were not administered the MRSA test. Among the screened patients, MRSA prevalence is 6%. It is assumed that unscreened patients would have the same characteristics as with screened patients, indicating that 1.5% of yearly admissions are unscreened MRSA-positive cases.

Methods:
Risk stratification model applies supervised learning concept and random forest methodology. Two years of data is split into training and testing sets. Variables like demographic information, patients' past 6 months hospitalisation days, antibiotics dosage and functional status are taken into account.

Results:
The predictive model stratifies MRSA colonisation risk upon admission and calculates a risk score ranging from 1 to 10, with the higher the score being associated with higher risk of MRSA colonisation. Based on the model, 52% of the admissions are scored as 1 and 48% admissions are scored as 2 and above. For patients with the score of 1, only 1.38% turned out to be MRSA-positive.

Discussion & Conclusion:
If we were to only screen admission cases with scores of 2 and above, there would be 0.72% MRSA positive cases undetected among unscreened cases instead of 1.5%. Comparing both methods, prediction model is screening 27% less admissions, and has an improvement of missing 48% less MRSA-positive patients.

HSR-11

A Pilot Study Using Keele STarT Back Screening Tool to Investigate the Profile of Low Back Pain Patients Requiring Tertiary Physiotherapy Services

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Background & Hypothesis:
Patients with non-specific low back pain (LBP) constitute a large portion of musculoskeletal conditions seen by physiotherapists. The right siting of care is important to ensure resources are allocated appropriately at primary and tertiary levels to manage the varying severity and complexity of these patients. This pilot study aims to investigate the profile of LBP patients referred via the primary care route to an orthopaedic specialist followed by tertiary physiotherapy services in a large hospital in Singapore.

Methods:
Data was collected for the month of July 2015 for all new LBP patients referred via the polyclinics to Tan Tock Seng Hospital (TTSH) specialist clinics (SOC) followed by TTSH Physiotherapy (PT) route. Patients were screened using the Keele STarT Back Screening Tool (SBST) which was developed for primary care providers for subgrouping LBP patients based on modifiable risk factors.

Results:
A total of 503 new patients were referred from polyclinic to SOC to PT route. There were 106 (21.1%) who were referred for LBP. Of these, 52 were successfully surveyed onsite or through phone calls. Data showed that 46.2% of these patients were graded "low risk" (low risk, n = 24; medium risk, n =16; high risk, n = 12). There were no significant difference in patient risk groups for gender ($P = 0.53$) and age ($P > 0.05$).

Discussion & Conclusion:
Low risk patients can be managed successfully through back care education and analgesia as reported by previous studies which used SBST. The administering of the tool at primary care level would aid the practitioner in stratifying the care needed for these patients.

HSR-12

Economic Burden of Progressive Kidney Disease in Type 2 Diabetes in Singapore

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Background & Hypothesis:
Renal disease affects about 40% of patients with type 2 diabetes mellitus (T2DM) and imposes substantial economic burden. There is, however, limited local data on chronic kidney disease (CKD) progression and its costs in T2DM. It is timely to examine medical costs associated with CKD progression.

Methods:
We conducted a prospective study on 676 patients with T2DM attending Diabetes Centre at a regional hospital. Data on patient characteristics were obtained from questionnaire and clinical measurements at multiple intervals. CKD progression was defined as worsening of estimated glomerular filtration rate (eGFR) categories with ≥25% decrease from baseline. Annual medical costs were assessed using hospital administrative data in 2011-2015. Contribution of CKD progression to annual costs was estimated using ordinary least squares regression. Pre- and postprogression costs were assessed using paired t-test.

Results:
At baseline, the distribution by eGFR staging was: stage 0-2 (eGFR ≥90 ml/min/1.73 m^2), 67.5%; stage 3 (eGFR 60-89 ml/min/1.73m^2), 23.2%; and stage 4 (eGFR <15 ml/min/1.73 m^2), 9.3%. Total mean (median) baseline costs were S$1972 (S$1042), S$4252 (S$1599) and S$4894 (S$2119) for stages 0-2, 3 and 4 respectively. Over follow-up of 2.8 ± 0.4years, 39.4% had CKD progression. Patients with progression incurred S$ 2681 more from mean adjusted baseline total costs than those without (+S$1971 vs -S$710; *P* <0.001). The observation was similar when stratified by eGFR staging. Among those who progressed, total costs postprogression were S$1948 (71%) higher than before (*P* <0.001). Annual inpatient, outpatient and ED costs were 100%, 32% and 151% higher postprogression (*P* <0.004, *P* <0.001 and *P* <0.001 respectively).

Discussion & Conclusion:
CKD progression was strongly associated with greater medical costs in T2DM. Preventing CKD progression is key to reducing costs, even at early renal function decline.

HSR-13

A Pilot Study to Investigate the Impact of Physiotherapy Services for Patients Presenting with Musculoskeletal Conditions in an Emergency Department Setting in Singapore

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Background & Hypothesis:
Providing early direct access to physiotherapy services for patients with musculoskeletal conditions such as acute low back pain has been advocated to prevent chronicity and further complexity. Patients presenting with stable musculoskeletal conditions at emergency departments (ED) in Singapore will typically be referred to an orthopaedic specialist before seeing a physiotherapist. This study aims to investigate the impact of providing direct on-site physiotherapy services within an ED in a major hospital in Singapore.

Methods:
Data of 317 patients seen by the on-site ED physiotherapist from June 2015 to March 2016 was collected from the medical records and actualised visits. Clinical outcomes reviewed included the Patient Specific Functional Scale (PSFS) and Visual Analogue Scale (VAS). A phone survey was conducted to evaluate the level of patient satisfaction.

Results:
The average wait time to commence physiotherapy improved from 19.6 days to 10.2 days. Patients treated earlier by the ED physiotherapist required an average of 1.8 sessions before their symptoms resolved as compared to 3.5 sessions before the commencement of the on-site service. Outcome scores improved significantly for VAS 1.43 (SD: 2.41), (P <0.001); and PSFS 2.76 (SD: 3.02), (P <0.001). Phone surveys showed that 91.3% of patients were satisfied with the direct onsite ED physiotherapy services.

Discussion & Conclusion:
Early on-site access to physiotherapy services has shown that symptoms can be resolved faster with a smaller number of physiotherapy sessions. Direct access without the need to consult an orthopaedic specialist would also allow better allocation of resources for the doctors to manage the higher priority and complex musculoskeletal conditions.

HSR-14

Improving Hospital Discharges through Understanding Why Families Hesitate to Bring Older Patients Home

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Background & Hypothesis:
Hospitals today face severe bed shortages which can in part be attributed to beds occupied by physically and cognitively frail older patients who remain in hospitals despite being out of acute illness. Family members are hesitant to bring them home as they express difficulties coping with their care. We aimed to explore factors contributing to family caregivers' hesitation to discharge older patients home from acute hospitals.

Methods:
A prospective study of older patients ($\geq$78 years) admitted to a tertiary hospital geriatric unit was conducted from January 2015 to January 2016. Patients from nursing homes were excluded. Using univariate and multivariate analyses, demographic and clinical variables associated with patients whose relatives had reservations about discharging the patient home were elicited.

Results:
Of the 693 patients, 76% of family members expressed issues with discharging the patient home. The patients had a mean age of 83 ± 7.1, age adjusted Charlson comorbidity index was 5.5 ± 1.8 and modified Barthel Index 51.8 ± 31.1. Multivariate analysis controlling for potential confounding variables found patients with dementia (OR: 3.72; 95% CI, 1.93-7.18) and divorced/single/widowed patients (OR: 4.59; 95% CI, 2.46-8.60) to have higher odds of discharge problems expressed by relatives.

Discussion & Conclusion:
In this moderately frail sample of older patients, a very high proportion of relatives expressed concerns with postdischarge care. Dementia is a risk factor, so are patients who are divorced/single/widowed and hence more likely to have limited family support. More infrastructural and psychosocial interventions need to be put in place to address the factors unveiled to ameliorate this pressing problem.

HSR-15

Prevalence and Associative Factors of Orthostatic Hypotension in Older Adults of the WiSE Study

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Background & Hypothesis:
Orthostatic hypotension (OH) is common among older adults. In the study, we examined the prevalence of OH and its associations with sociodemographic factors, chronic medical conditions, health-related factors, and health service utilisation in a cross-sectional epidemiological study of older adults residing in Singapore.

Methods:
Data was collected from 2266 participants (≥60 years) who participated in the Well-being of the Singapore Elderly (WiSE) study. Face-to-face interviews and physical examinations were conducted to collect information on sociodemographic factors, chronic medical conditions, blood pressure measurements, and utilisation of health services. Blood pressure was measured using an electronic sphygmomanometer. OH was defined by a fall of systolic blood pressure of at least 20 mm Hg and/or diastolic blood pressure of at least 10 mm Hg from sitting to standing positions.

Results:
The prevalence of OH was 7.8% in this population. Compared to those aged 60-74 years, the odds ratio of OH was 1.76 (1.08-2.85; $P = 0.023$) for those aged 75-84 and 2.33 (1.26-4.30; $P = 0.007$) for those aged 85 years and above. Participants with hypertension were also more likely to have OH (OR: 3.03; 1.56-5.88, $P = 0.001$). Other health-related factors were not found to be significantly associated with OH.

Discussion & Conclusion:
The prevalence rate of OH was comparable to that found in epidemiological studies conducted in other countries. Older age and hypertension were independently associated with OH in the older adult population in Singapore. Screening tests and educating the elderly on OH should be implemented so that falls and injuries can be prevented.

HSR-16

Improving Access to Addiction Treatment Service through Same-Day Appointment

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Background & Hypothesis:
The National Addiction Management Service (NAMS) clinic experienced a 54% default rate for first-visit appointments. Despite attempts to remind patients of their appointments, the default rate persisted over the years. One of the main reasons the patients defaulted the first-visit was because of the lack of motivation to seek treatment by the time the appointment was due. The impact of having a high number of defaults are: unutilised appointment slots that could be given to other patients who may benefit from earlier appointments, and inefficient resource allocation when patients default the appointments. As such, the NAMS team decided to implement intervention to reduce the default rate.

Methods:
Based on the assumptions that patients who are motivated to seek treatment will make time to visit the specialist within 24 hours, and patients' motivation would wane the longer they wait to get access to treatment, the NAMS team designed a same-day appointment (SDA) scheme whereby patients who walk in or call the helpline would get treated within 24 hours.

Results:
The default rate reduced from 54% to 35.8% (based on FY15 Q4 data).

Discussion & Conclusion:
The same-day appointment is effective in reducing the default rate by 18.2%. The improvement has led to firstly, prompt access to care for patients seeking treatment, secondly, reduced "wasted" appointment slots, thirdly, reduced appointment wait time, and lastly improve efficiency in resource deployment.

HSR-17

Associative Stigma among Mental Healthcare Professionals Working at the Institute of Mental Health

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Background & Hypothesis:
Associative stigma refers to the prejudice and discrimination experienced by others associated with people with mental illness. The aim of this study was to explore the extent of associative stigma among staff at the Institute of Mental Health (IMH) – a tertiary psychiatric institute.

Methods:
The study included doctors, nurses and allied health staff working at IMH, who were aged 21 years and above and able to complete the online survey. A 5-item associative stigma scale was used, where respondents were asked to indicate how often they had experienced stigma: "never", "rarely", "sometimes", "often" or "always".

Results:
A total of 462 staff completed the survey: doctors (n = 58), nurses (n = 201) and allied health (n = 203); 17.3% indicated that people often/always react negatively when they know they work in mental healthcare, while 24.9% often/always felt that people make jokes about them for working in mental healthcare. Very few staff were often/always ashamed to be working in mental healthcare (0.7%) or reluctant (3.7%) to tell people they work in mental healthcare, while just 2.1% had often/always been treated unfairly by others as a consequence of working in mental healthcare.

Discussion & Conclusion:
Results revealed that IMH staff were rarely ashamed or reluctant to tell people they work in mental healthcare. Others often reacted more negatively towards them as a result of working at IMH. These findings have important implications and highlight the need to reduce stigma related to mental healthcare and people with mental illness among the general population.

HSR-18

Staff Opinions of Frequent Psychiatric Emergency Services Users

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Background & Hypothesis:
The present study used administrative data and qualitative interviews to identify frequent visitors and understand staff opinion of frequent visitors to Singapore's dedicated psychiatric emergency department.

Methods:
The administrative records of all visits to the psychiatric emergency department (16,686 visits) over the year 2014 were reviewed to determine the characteristics of frequent visitors. Random effects logistic regressions were used to associate demographic and diagnosis with frequent visitors. The perspectives of 26 service providers facilitated interpretation of administrative data in a convergent mixed-methods study design.

Results:
Using 5 visits or more to define frequent use distinguished the top 3% of users. This group, accounting for 15% of service use, was more likely to have a diagnosis of schizophrenia, personality disorder, learning disability or alcohol use disorder. Service providers described similar groups of service seekers, and noted that the cause for frequent use related to lack of social support and feelings of belonging within the institute. Challenges related to managing intoxicated service seekers and managing expectations for admission and threats of self-harm.

Discussion & Conclusion:
The profiles of frequent users in Singapore resemble those reported in other large urban centres. This informs the potential for generalising treatments established elsewhere. The opinion of service providers and reactions to difficult situations echo findings documented in non-psychiatric settings. The perspective of service providers is essential to understanding the societal pressures which influence the way this group uses services.

HSR-19

The Impact of Stakeholder Preferences on Service User Compliance

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Background & Hypothesis:
People with mental illness are known to have reduced life expectancy due to comorbidities. Some of these medical comorbidities result from psychiatric treatment. It is therefore imperative that treatments be paired with medical screening and treatment. Research has shown that despite knowledge of the frequent comorbidities, few service-users adhere to treatment for medical comorbidities.

Methods:
The present study obtained the perspective of 20 service-providers, 25 service-users, and 10 caregivers to understand how their opinions of treatment influenced service-user adherence. Grounded theory was used to iteratively conduct and analyse interviews. Priority was given to content which surfaced in interviews of all three stakeholders.

Results:
The data suggest that adherence to following up with necessary steps to treat metabolic comorbidities (either regular screening or complying with treatment) is influenced by: 1) the individual's opinion of physician competencies, 2) the absence or presence of symptoms, 3) socionormative pressures (either stigma of attending, or support from friends and family), and 4) resource availability.

Discussion & Conclusion:
If a service-user has the resources to follow-up with the treatment of their comorbidity, the source of treatment matters less than their opinion of the professional. But if the service-user is less able to rely on personal resources or family, the location may be pivotal in ensuring that care is obtained. In these latter cases, the psychiatrists may need to provide care for both the psychiatric condition and the metabolic comorbidity despite their desire for metabolic comorbidities to be treated by a specialist.

HSR-20

Pain among People Aged 60 Years and Above in Singapore − Prevalence and Associations

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Background & Hypothesis:
Although pain is experienced among people of all ages, there is a need to study its risk factors and impact among older adults. The study sought to determine the prevalence as well as sociodemographic and clinical correlates of pain among older adults in Singapore. It also investigated the association of pain with disability among the elderly in Singapore.

Methods:
The Well-being of the Singapore Elderly (WiSE) study was a comprehensive cross-sectional, single-phase, epidemiological survey conducted among Singapore citizens and permanent residents, aged 60 years and above, living in Singapore at the time of the survey. This study used a nationally representative sample which encompassed the 3 main ethnic groups in Singapore: Chinese, Malay and Indian. The survey adapted 10/66 protocol pain questionnaire to establish the prevalence and risk factors of pain along with sociodemographic questionnaire, health status questionnaire, World Health Organization Disability Assessment Scale (WHODAS 2.0) and Geriatric Mental State (GMS) examination.

Results:
A total of 2565 respondents completed the study giving a response rate of 65.5%. This study found the prevalence of pain among elderly aged 60 years and above to be 19.5 %. Females, incomplete primary education (versus complete tertiary education), Indians (versus Chinese) and those diagnosed with any chronic health condition were associated with risk of pain and disability.

Discussion & Conclusion:
Study findings found that disability related to pain among the elderly is considerable. It should be a high public priority to reduce the morbidity and disability associated with pain in the elderly.

HSR-21

Inpatient Glycaemic Control in a Tertiary Care Hospital

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Background & Hypothesis:
Inpatient hyperglycaemia and hypoglycaemia are associated with adverse patient outcomes. Bedside capillary blood glucose (CBG) point of care testing (POCT) and an information management system allows benchmarking of glycaemic control and assessment of the impact of interventions. This study analysed our hospital's CBG POCT data from 2013 to 2015 as an overall measure of inpatient glycaemic control.

Methods:
Data from the CBG POCT database of our 1500-bed tertiary care hospital was extracted and analysed over the 3-year period between 2013 and 2015. For the purposes of this study, severe hyperglycaemia was defined as a CBG of >16 mmol/L and hypoglycaemia was defined as a CBG of <4 mmol/L.

Results:
In the 3-year period from 2013 to 2015, a total of 2,716,167 CBG readings were taken at our 1200-bed tertiary care hospital (850,127 readings in 2013; 962,629 readings in 2014; and 903,411 readings in 2015). The median blood glucose reading was 8.0 mmol/L; 166,222 (6.1%) readings were >16.0 mmol/L while 43,715 (1.6%) were <4.0 mmol/L. The proportion of CBG readings showing severe hyperglycaemia showed a gradual decrease over the 3-year period (6.9% in 2013, 6.2% in 2014 and 5.3% in 2015) (chi-squared test for linear trend, *P* <0.001) with no corresponding increase in hypoglycaemia rates (1.6%).

Discussion & Conclusion:
Our study suggests improving inpatient glycaemic control in our hospital between 2013 and 2015. Multiple interventions targeted at inpatient glycaemic control during the 3-year period may have resulted in this improvement.

HSR-22

Cognitive Insight among Psychiatric Outpatients in Singapore

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Background & Hypothesis:
Extant research has predominantly focused on clinical insight (awareness of illness and need for treatment) and less on cognitive insight (evaluation and correction of distorted beliefs) among individuals with mental illness. Understanding cognitive insight (CI) is crucial given its association with treatment dropout, and maintenance of delusional beliefs. The current study examined CI among psychiatric outpatients in Singapore.

Methods:
Outpatients (n = 250) diagnosed with schizophrenia and related psychosis, anxiety disorders, and mood disorders were recruited from the Institute of Mental Health. The Beck Cognitive Insight scale (BCIS) consisting of 2 subscales: self-reflectiveness (SR) and self-certainty (SC) was used to examine CI. A composite score of CI was derived by subtracting SC from the SR score; higher SR and lower SC are reflective of good insight.

Results:
ANOVA was used to examine mean differences in SR, SC, and CI scores across diagnostic groups and sociodemographic factors. Individuals with schizophrenia and related psychosis (M = 11.09, SD = 5.05) had lower SR mean scores than those with anxiety disorders (M = 13.35, SD = 4.46; *P* = 0.02) and those with mood disorders (M = 12.65, SD = 4.57; n.s.). Malays and those without formal education had higher SC scores compared to the Chinese and those with tertiary level education. No significant results were found in relation to the composite score.

Discussion & Conclusion:
In line with past studies, individuals with schizophrenia and related psychosis had lower SR score compared to other disorders. Given evidence linking low SR (poor insight) with treatment non-compliance, future studies can look into increasing insight among this group.

HSR-23

Positive Mental Health in Psychiatric Outpatients and its Comparison with a Community Sample

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Background & Hypothesis:
Positive mental health (PMH) encompasses an individual's social, emotional and psychological well-being, supplementing the definition of mental health which is not just the mere absence of mental illnesses. This cross-sectional study examines the PMH levels in a multiethnic outpatient population and draws comparisons with the general population. In addition, we studied sociodemographic correlates of PMH across the various diagnostic groups.

Methods:
Outpatients with schizophrenia spectrum, depressive or anxiety disorders seeking treatment at a tertiary psychiatric hospital were included in the study sample. All respondents completed the multidimensional PMH instrument, which has been validated and developed in Singapore. Independent t-tests and ANOVA with Bonferroni posthoc tests were used to establish differences between the PMH levels and domains.

Results:
A total of 360 outpatients with a mean age of 39.2 years were included in the study. The sample had a slightly higher proportion of those aged 21-39 years (52.5%), males (50.8%) and those who were unemployed (56.1%). PMH and its domain scores differed significantly between the patient and general populations. There were significant associations of the PMH domains with sociodemographic variables such as age, ethnicity, gender and education status in the patient population.

Discussion & Conclusion:
It is critical that mental health professionals examine the domains of positive mental health in individuals with mental illnesses. This will allow them to develop coping strategies that can look into focusing on emotional, psychological and social well-being appropriately to allow these individuals to thrive.

HSR-24

DSM-5 Insomnia Disorder and Treatment Contact for Sleep Disturbance among Psychiatric Patients

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Background & Hypothesis:
In recognition of the independent clinical importance of a sleep disorder, the Diagnostic and Statistical Manual of Mental Disorder, fifth edition (DSM-5) has removed the distinction of primary and secondary insomnia in DSM-IV and advocated for the treatment of insomnia itself in addition to the medical or psychiatric disorder. This study assessed the prevalence of DSM-5 insomnia disorder and the treatment context for sleep difficulties in a psychiatric population.

Methods:
A total of 400 outpatients with mental disorders were recruited from September 2015 to April 2016. The interviewer-administered Brief Insomnia Questionnaire (modified) (BIQ) was used to estimate both primary insomnia (DSM-IV-TR) and insomnia disorder (DSM5). Information on patients' past help-seeking experiences for any insomnia-related symptoms was also collected using semi-structured questionnaire.

Results:
The prevalence of insomnia diagnosis increases from 15.9% to 31.5% following the changes in diagnostic criteria. Of the 200 patients who reported ever seeking help for sleep problems, 91% were prescribed psychotropic medications that helped them sleep, of which 74.2% found the drug treatment effective. Common concerns were, however, daytime drowsiness, drug dependence and losing effectiveness. Only 22 patients recounted being educated on sleep hygiene or receiving some form of psychotherapy by a healthcare professional.

Discussion & Conclusion:
With the new calling from DSM-5, clinicians treating psychiatric patients should view insomnia less as a symptom of their mental illnesses and emphasise treating insomnia as a disorder itself, which research has shown also helps alleviate co-occurring psychiatric symptoms. Non-medical (cognitive and behavioural) interventions for insomnia need to be further explored among psychiatric patients given their proven clinical effectiveness.

HSR-25

The Chances of Rat Blood Plasma H2S Concentration after Musculoskeletal System Trauma under the Experimental Hyperhomocysteinaemia Conditions

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Background & Hypothesis:
Trauma and surgery lead to generalised vascular endothelial damage. The metabolism of homocysteine and H2S also plays a role in the development of endothelial dysfunction.

Methods:
The experiment was performed on 32 male rats (Rattus norvegicus), taking into account the principles of bioethics. The induction of hyperhomocysteinaemia was carried out by injection of L-methionine (0.04 g/100 g body weight per day for a month). Formation of the injury was performed using a special device. Animals were randomised into 4 groups: 1) intact animals (control group); 2) animals with injury; 3) animals with hyperhomocysteinaemia; and 4) animals with hyperhomocysteinaemia and injury. Blood plasma was taken at the 3rd day after the formation of the injury. Homocysteine level was measured by Immulite 2000xpi (Siemens). H2S level was measured with the use of N, N-dimethyl-p-phenylenediamine. For statistical data analysis, STATISTICA 10.0 was used.

Results:
The level of homocysteine in the control group was 7.46 ± 0.33 mkmol/l, 2nd group $-$ 7.47 ± 1.24 mkmol/l; 3rd and 4th groups reached 48.03 ± 0.98 mkmol/l and 46.2 ± 1.27 mkmol/l. This corresponds to an average level of hyperhomocysteinaemia. H2S level in the plasma of the third group was 72.39 ± 3.8 mkmol/l , which is 30% higher than in the control group (55.6 ± 2.1 mkmol/l); in the 2nd and 4th groups, no statistically significant changes had been found ($57,83 \pm 5.7$ and 59.73 ± 4.9 mkmol/l).

Discussion & Conclusion:
Mechanical injury causes a decrease in the level of H2S in animals with experimental hyperhomocysteinaemia, which leads to violations of vascular-platelet hemostasis, such as in endothelial dysfunction, increased platelet aggregation. This study was carried on the equipment of CCU "High Technology".

HSR-26

Predictive Diagnostics of Newborn Pathologies Based on Neuroph Software Framework

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Background & Hypothesis:
The expert system for predictive diagnostics of newborn pathologies based on neuroph software framework of maternal genetical and biochemical profile was suggested.

Methods:
The polymorphisms in the following genes were investigated: *MTHFR, MTR, F2, F5, F7, F13, FGB, ITGA2, ADD1, AGT, NOS*. Biochemical markers were presented by levels of some hormones. The outcomes were postpartum bleeding, breathing problems and placental abruption. In total, 201 cases were analysed: 67 controls and 136 with pathologies. The calculations were made with the help of neural network based on Neuroph software framework. Naive Bayes classifier was trained for comparison. To test our prediction model, the cross validation technique was applied. All cases were shuffled and then formally split into 2 groups: training and testing sets, in the proportion of 9 to 1.

Results:
Being trained, neural network successfully recognised 95% of samples in the training set and more than 80% of samples in the testing set. Naive Bayes classifier showed significantly lower recognition rates: 65% and 55% respectively.

Discussion & Conclusion:
To increase the accuracy of prediction, data set should be considerably expanded. It requires the creation of a publicly available curated database to cooperate with other researchers. The set of the topmost informative markers was found to decrease the cost of the diagnostics. (This study was supported by the Federal assignment № 6.703.2014/K from the Russian Ministry of Science and Education.)

HSR-27

Teaching Carer-assisted Clean Intermittent Catheterisation in Disabled Community-dwelling Elderly Women: A Case Series

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Background & Hypothesis:
Teaching of clean intermittent catheterisation (CIC) to carers is usually done in an inpatient or clinic setting. We looked at the outcomes of CIC done by carers as taught at home by our hospital transitional care team.

Methods:
This is a case series of 5 elderly females who developed urinary retention during their hospital stay and were discharged with indwelling urinary catheters (IDC). They were referred to the Post Acute Care at Home (PACH) transitional care team upon discharge for follow-up.

Results:
The 5 female patients (aged 81-92 years old) were referred to and attended by the PACH team between August 2014 to October 2015. Indications for IDC insertion were urinary retention secondary to constipation and decreased mobility for 4 patients, and to facilitate sacral sore healing in 1 patient. Trial-off catheter was done at home, and the carers (2 maids, 2 daughters and 1 daughter-in-law) were taught how to perform CIC at home in 2-3 half-hour sessions. Four out of 5 patients (80%) did not require long-term IDC. Two patients were successfully weaned off CIC within 2-4 weeks. Two patients were advised to continue doing CIC once daily to prevent recurrent urinary tract infections (UTI), with CIC volumes ranging from 125-250 ml in 1 patient, and 60-140 ml in another patient. Two of the 5 patients developed UTI while they were on CIC, and were treated with oral antibiotics.

Discussion & Conclusion:
Teaching of intermittent catheterisation can be done safely at home.

HSR-28

The Role of Caregiver Demographics in Predicting Caregiving Burden and the Association with Care Recipients' Cognitive Decline

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Background & Hypothesis:
Ageing populations and increased life expectancies have led to the rising prevalence of dementia and cognitive impairment, currently estimated to be approximately 15.2% amongst Chinese Singaporeans (Hilal et al, 2013). Consequently, the burden of care for caregivers is expected to intensify. We examined the profile of caregivers of patients on follow-up with a specialist Memory Clinic to identify: 1) demographic factors predictive of greater burden of care, and 2) their associations across care recipients' cognitive decline.

Methods:
Patient-caregiver dyads (jn = 779) seen at the NUH Memory Clinic from 2013 to 2015 were included in this cross-sectional service review. Demographic information and patients' diagnoses (dementia, mild cognitive impairment [MCI] or normal ageing [NCI]) were recorded. Caregiver burden was measured using the 12-item Zarit Burden Interview (ZBI).

Results:
Caregivers were mainly an adult child/child-in-law (74.6%), female (62.4%) and providing care for a patient with dementia (59.1%). Caregivers of dementia patients indicated higher scores on the ZBI (18.57 ± 9.80) than those of MCI (14.28 ± 9.07; $P < 0.001$) and NCI patients (14.06 ± 8.97; $P < 0.001$). Females experienced greater burden than males, but only amongst caregivers of dementia patients ($P = 0.027$). Adult children/children-in-law generally reported greater burden than spouses ($P = 0.051$), with the effect most pronounced amongst MCI caregivers ($P = 0.006$).

Discussion & Conclusion:
This review identified caregivers (female, adult child/child-in-law) most vulnerable to caregiving burden, and distinguishes that this burden differs across stages of care recipients' cognitive decline. The findings highlight the need for interventions to better support caregivers in their roles, as part of Singapore's blueprint in enhancing care delivery for the elderly.

HSR-29

The Cost of Glaucoma Medications among Patients with Open Angle Glaucoma in a Clinical Population: A Pilot Study

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Background & Hypothesis:
Glaucoma medication plays a major role in the treatment of patients with glaucoma, leading to increase burden of cost both to individuals, and society. Our study aims to study the cost of glaucoma medications among patient with open angle glaucoma, and to stratify according to the severity of the glaucoma.

Methods:
Patients with open angle glaucoma who were diagnosed at least 5 years prior were studied. The glaucoma medications given during the years of follow-up were analysed and the cost burden of glaucoma medications was calculated based on the current cost. The patients were stratified according to severity of glaucoma based on the Brusini Glaucoma Staging System.

Results:
There were a total of 76 patients with open angle glaucoma studied. Based on the Bascom Palmer Glaucoma Staging System, there were 2 patients in severity stage 0; 12 patients in stage 1; 13 patients in stage 2; 11 patients in stage 3; 16 patients in stage 4; and 21 patients in stage 5. The cost of medication per annum per patient for each stage is as follows – Stage 0, S$0; Stage 1, S$81.39; Stage 2, S$246.37; Stage 3, S$354.33; Stage 4, S$289.28; Stage 5, S$312.98.

Discussion & Conclusion:
The cost burden of glaucoma medication is high among the moderate to advance stages of glaucoma. Further analysis should be done on the cost of other procedural and surgical treatment of glaucoma, and to analyse the cost burden of medication versus non-medication treatment.

HSR-30

Determinants of a Satisfied Consultation in Polyclinics in Singapore

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Background & Hypothesis:
A good consultation is at the centre of clinical practice in primary healthcare and patient satisfaction is a key predictor of this. The aim of this study was to capture the level of patient satisfaction and determine the interpersonal factors that affected it throughout the consultation process.

Methods:
A cross-sectional study comprising 2 parts—an interviewer-completed form and an interviewer-assisted patient completed questionnaire modelled after validated questionnaires—was conducted. A convenience sample of patients aged ≥21 from both acute and chronic clinics in Toa Payoh Polyclinic over 10 days yielded a total of 203 responses across 12 different doctors. Data was analysed using SPSS v21.

Results:
The median satisfaction score was 8/10. By univariate analysis, spending enough time with the patient ($P = 0.026$), fulfilling the patient's expectation of a good consultation ($P = 0.021$), care and compassion ($P < 0.0001$) and total consultation time ($P = 0.034$) were associated with satisfaction. Binary logistics regression revealed that total consultation time longer than 260 seconds (median) were more than twice as likely to attain satisfaction (OR: 2.132, $P = 0.019$). Subgroup analysis for acute and chronic consultations showed care and compassion as significant for both, and total consultation time for the latter.

Discussion & Conclusion:
The present study showed that interpersonal factors were the main driving force behind patient satisfaction, even consistently across acute and chronic consultations individually. Hence, greater emphasis should be placed on improving interpersonal skills of healthcare professionals to strive towards delivering a satisfied consultation.

HSR-31

A Novel Way to Visualise and Analyse Chronic Disease Pathway of Newly Diagnosed Diabetes Patients Using Chronic Disease Registry

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Background & Hypothesis:
Large administrative data can complement clinical knowledge and provide insights to local patients' disease trajectory. Three healthcare clusters share the Chronic Disease Management System (CDMS) that provides rich information on patients' chronic conditions. In this study, we present a novel way to map the complex chronic trajectory of newly diagnosed type 2 diabetes patients.

Methods:
We used CDMS to identify retrospective cohort of patients who developed diabetes from 2007 to 2010, and had negative lab tests 1 year prior. We extracted their other diseases till 2015. We divided the patients into Group 1: those without other diseases (excluding hypertension and hyperlipidaemia) prior to having diabetes; and otherwise into Group 2. Process mining (PM) was used to visualise the disease pathways.

Results:
There were a total of 13,549 patients (7123 in Group 1) and 2604 trajectories. The top trajectory (37%) was patients with only diabetes. The next trajectory (4%) was patients who developed CKD3A. The subsequent complications (%, median duration) from Group 1 included CKD3A (14%, 3.7 yr), CKD4 (1.9%, 4.5 yr), anaemia (12%, 2.8 yr), CHD (7.0%, 2.8 yr) and stroke (3.5%, 2.8yr). The PM map also identified significant flows between anaemia and CKD3A. For Group 2, the pre-existing or concurrent conditions included CKD3A (39%), CHD (31%) and stroke (20%).

Discussion & Conclusion:
While there are limitations, this process mining study went beyond simple pairwise disease association and explored highly complex longitudinal disease sequences. Further work includes studying other cohorts and clustering of the trajectories to identify key segments for population management.

HSR-32

The Use of Cognitive Interviewing (CI) to Improve the Design of the Glaucoma Utility Index-Singapore (GUI-S) Tool

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Background & Hypothesis:
We have developed a Glaucoma Utility Index for use in Singapore (GUI-S) using discrete choice experiment (DCE) methodology. Cognitive interviews (CIs) were used to determine the clarity of the content and response options of the GUI-S and to improve the choice of words and presentation of the GUI-S.

Methods:
The GUI-S comprises 7 quality of life (QOL) dimensions important to glaucoma patients – central and near vision, lighting and glare, mobility, activities of daily living, eye discomfort, psychosocial effects, and other glaucoma and treatment effects. Each dimension has 3 levels of difficulty: no, some and severe. Dimensions are presented in 8 "choice sets" where participants must indicate which of 2 different scenarios they prefer. Three rounds of cognitive interviews were iteratively conducted on individuals with (n = 3) and without (n = 5) glaucoma to understand their comprehension of the dimensions' description, and the visual presentation of the choice sets. A composite readability score tool was used to generate average reading grade levels for the descriptors (target <8), with the scores before and after the modifications compared.

Results:
The descriptions of the dimensions were simplified, with the average number of words decreasing from 107 to 74 (-31.5%). Changes were made to 13 terms to suit the local context (e.g. household chores to housework, mobility to movement). The average reading grade level for the 7 descriptors was reduced from 11.6 to 7.2 (-37.6%).

Discussion & Conclusion:
Cognitive interviewing has resulted in marked improvements in the readability and the presentation of descriptors and choice sets, facilitating more effective utilisation of the GUI-S.

HSR-33

Quality of Life in Long-Stay Patients with Schizophrenia or Schizoaffective Disorder

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Background & Hypothesis:
Little is known about health-related quality of life (HRQoL) among institutionalised patients with serious mental illness. Hence, this study aimed to identify factors which could affect the HRQoL in a population of long-stay patients in an institution.

Methods:
A total of 110 inpatients diagnosed with schizophrenia or schizoaffective disorder, who had stayed at least 1 year in Institute of Mental Health were recruited for the study. The EuroQoL 5 dimensions (EQ-5D) questionnaire was used to measure HRQoL. EQ-5D comprises a descriptive system, which assesses 5 domains: mobility, self-care, usual activities, pain/discomfort and anxiety/depression. Responses to these domains were converted into a single summary EQ-5D index, which indicates the utility of the described health states. Sociodemographic and clinical characteristics (e.g. medical history and medications) were recorded in a standardised data collection form and data was analysed using multiple logistic and linear regression models.

Results:
No significant results were found for sociodemographics with HRQoL or the 5 dimensions. Patients prescribed with benzodiazepine were (OR: 0.01) less likely to report problems with self-care. Those prescribed with mood stabilisers were (OR: 0.35) less likely while those on "high" dose of antipsychotics (OR: 4.34) and antidepressants (OR: 3.67) were more likely to report problems with anxiety/depression. Overall, the prescription of antidepressant medications was significantly associated ($\beta = -0.08$) with poorer EQ-5D index.

Discussion & Conclusion:
Poorer quality of life of patients on antidepressant could be due to the residual symptoms of depression. This study highlights the need for clinicians to regularly observe and follow up inpatients on antidepressants and monitor their symptoms and quality of life regularly.

HSR-34

Strategies to Improve Uptake of Annual Influenza Vaccination Rates among Healthcare Workers in Community Care

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Background & Hypothesis:
Annual influenza vaccination is an important strategy against healthcare workers (HCWs) contracting influenza illness and transmitting to patients. Influenza vaccination of HCWs decreases absenteeism, patient mortality and enhances patient safety. However, rates of annual influenza vaccination among HCW have been reported to be low worldwide. Before June 2014, vaccination rate in our department has been suboptimal (<60%). Based in a tertiary centre, our HCWs work in multidisciplinary teams and almost entirely in community-based settings, interacting with patients and caregivers all over Singapore. A team was set up to review the literature and propose strategies to improve vaccination uptake in June 2014.

Methods:
Free staff vaccination, email reminders and a mobile vaccination team have already been in place since 2011. After literature review and informal discussions with staff, the team decided to employ the following measures from July 2014 (prior to the 2014 NH influenza season): staff education and staff declaration form indicating understanding of the benefits of vaccination. This was an idea modified from institutions using declination form. Due to staff turnover, all new staff is required to fill up the form. Mandatory vaccination was not considered as it was not a hospital policy.

Results:
Vaccination rate among HCW improved from 48.1% (June-August 2014) to 60.7% (September-November 2014; *P* = 0.3) and 100% (May-Jun 15; *P* <0.001).

Discussion & Conclusion:
A strategy of employing different approaches has increased HCW vaccination rate. This may be due to educating HCWs about safety of the vaccine and the importance of vaccination in patient care and removing barriers to access by HCWs.

HSR-35

Improving the Response Time of Doctors during Code Blue Activation in a Psychiatric Hospital

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Background & Hypothesis:
Two on-call doctors cover code blue in the entire IMH which has 50 wards in 9 blocks at all times. It is a JCI requirement for patients to have access to ACLS in all areas of hospital within 5 minutes. Only doctors are trained in ACLS. Hence, this JCI standard can only be achieved if all the on-call doctors arrive within 5 minutes of patient's collapse. Data collected from July 2014 to January 2015 showed that the above timing was achieved in 40% of the code blue drills (5 out of 12). The project aimed to increase the percentage of doctors arriving within 5 minute of patient collapse from 40% to 100%.

Methods:
The project used CPIP methodology. Interventions (such as running through the steps of code blue activation during nursing handover and educating the nurses to pull panic alarm when there is no one around to help) were piloted in a few wards. Code blue occurs rarely in IMH (1.5 cases monthly). Hence, code blue drills were used to measure the effectiveness of interventions. Each code blue drill was a PDSA cycle as the team members could directly observe whether the interventions were carried out properly and whether they were effective.

Results:
Percentage of doctors arriving within 5 minutes of patient collapse was increased from 40% to 66% during 3 months after interventions.

Discussion & Conclusion:
Rigorous PDSA cycles were demonstrated in this project. A system change may be needed to achieve the stretch target of 100%.

HSR-36

A Review of Post-Acute Care at Home (PACH) Programme

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Background & Hypothesis:
TTSH Post-Acute Care at Home (PACH) programme aims to reduce preventable readmissions by increasing caregiver competency at home. A review was conducted to determine PACH's effectiveness.

Methods:
Quantitative and qualitative methodologies were employed on a sample of 30 patients. Home visits, patient records and caregiver interviews were studied. Qualitative data was analysed via Colaizzi's method while quantitative data was analysed via STATA regression software.

Results:
Sixty-four percent were at risk of readmission. Mean duration in PACH was 8 weeks. Four themes regarding PACH's value to caregivers were identified addressing both medical and non-medical caregiving issues – reducing caregiver-family conflicts and increasing caregiver confidence; providing understandable advice through dialects and simple analogies; promptly responding to calls and requests for emergency visits. The number of preventable readmissions reduced from 23 (pre-PACH) to 7 (during PACH). Pneumonia and UTI were the most common reasons for readmission. Multiple linear regression analysis suggests that after controlling for patient's condition, caregiver burden and caregiver perceived competence, significant predictors of preventable readmission are prior caregiving experience ($\beta = -0.344$, $P = 0.063$), whether PACH is promptly informed during emergencies ($\beta = 0.913$, $P = 0.028$) and caregiver's ability to recognise warning signs for readmission ($\beta = -0.928$, $P = 0.017$).

Discussion & Conclusion:
PACH reduces preventable readmissions through early detection. The advice and education provided is highly valued and practisable by caregivers. While this study sheds light on the benefits of transitional care, it remains to be seen if the duration of such programmes should be increased.

HSR-37

Correlation Analysis for Patient Shifts with Impaired Thought Process

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Background & Hypothesis:
"Number of Patient Shifts with Impaired Thought Process" was selected as an indicator to understand inpatient falls. It was observed that "Number of Patient Shifts with Impaired Through Process (Minor)" had increased from April 2014 to August 2015. In order to understand possible correlations with the increase in "Number of Patient Shifts with Impaired Through Process (Minor)", 2 possible factors were identified, namely the number of elderly patients and number of transfers between wards.

Methods:
A correlation analysis was performed to test whether "Number of Inpatients Aged 65 and Above", "Number of Inpatients Aged 85 and Above" and "Number of Transfer-In Between Wards" were correlated with the "Number of Patient Shifts with Impaired Thought Process (Minor)".

Results:
It was found that "Number of Patient Shifts with Impaired Thought Process (Minor)" had a positive linear correlation with "Number of Inpatients Aged 65 and Above", "Number of Inpatients Aged 85 and Above" and "Number of Transfer-In Between Wards". A linear regression model was developed to represent the relationship.

Discussion & Conclusion:
From the study, transfers were found to have an impact on elderly patients, especially for those aged 85 and above who were at more risk. Actions to mitigate the observed risks include: 1) reduce indiscriminate transfers; 2) re-orientate and provide falls education upon transfer; 3) strengthen handover of patients upon transfers; 4) advise family to stay with patient as much as possible in the first 24 hours; and 5) maintain close supervision especially in the first 24 hours following the transfer.

HSR-38

The Effect of Depression on Health-related Quality of Life among Multimorbidity Patients in Primary Care

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Background & Hypothesis:
Depression affects patients' quality of life, yet it is often underdiagnosed in primary care. Quality of life is increasingly being used to evaluate outcomes in clinical studies of patients with chronic diseases. In this study, we examined the correlation between depression and health-related quality of life (HRQOL) among patients with multimorbidity (co-occurrence of 3 or more chronic diseases within an individual) in a primary care setting.

Methods:
A total of 910 patients with coexisting diabetes, hypertension, and dyslipidaemia were randomly selected and interviewed at National Healthcare Group Polyclinics (Hougang). Patient Health Questionnaire-9 (PHQ-9) and EuroQoL-5 Dimension (EQ-5D) were used to measure the severity of depression and HRQOL respectively. Correlation between PHQ-9 scores and mean EQ-5D index score was analysed using general linear model. Sociodemographic data were adjusted in the analyses.

Results:
The majority of interviewed patients were male (55.1%), of Chinese descent (82.6%), aged 65 to 80 (52.4%), married (79.3) and with primary/PSLE education level (31.5%). The prevalence of moderate to severe depression (optimal cutoff point of 6) in this group of patients was 9.6%. The mean EQ-5D index score was 0.890 which was significantly lower (P <0.0005) than the pre-established general population mean of 0.951. Analyses revealed that lower depression scores were significantly associated with higher EQ-5D index scores (b = 0.167, P <0.001).

Discussion & Conclusion:
Patients with multimorbidity have lower HRQOL than the general population in Singapore. Patients diagnosed with moderate to severe depression were more likely to report poorer HRQOL. Therefore, early screening of depression among patients with multimorbidity helps institute the necessary required interventions.

HSR-39

Cost-Effectiveness of Hydrotherapy for Musculoskeletal Disorder: A Decision-Analytic Model

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Background & Hypothesis:
Hydrotherapy is a water-based form of rehabilitation used in treating different types of musculoskeletal disorders (MSDs) and neuromuscular conditions. This study aimed to assess the cost-effectiveness of hydrotherapy as compared to land-based therapy for patients with MSDs in Singapore.

Methods:
We developed a decision tree to estimate cost-effectiveness of hydrotherapy relative to land-based therapy over a 3-month time horizon. Target cohort comprised patients with low back pain (LBP), osteoarthritis (OA), rheumatoid arthritis (RA), total hip replacement (THR) and total knee replacement (TKR) as informed by the MSD patients seeking rehabilitation in Tan Tock Seng Hospital in 2014. Quality of life data were systematically obtained from published literature and cost data from hospital databases. Incremental cost per quality-adjusted life-years (QALYs) gained was computed for hydrotherapy. Deterministic and probabilistic sensitivity analyses were conducted.

Results:
From the societal perspective, hydrotherapy was associated with an incremental cost-effectiveness ratio (ICER) of SGD 27,471 per QALY gained when compared with land-based therapy. At a threshold of SGD 70,000 per QALY gained, hydrotherapy represented a good value for money option for the entire cohort. The cost-effectiveness of hydrotherapy was heterogeneous across the 5 MSDs: dominant (more effective and cheaper than land-based therapy) for THR and TKR, cost-effective for LBP and RA, and not cost-effective for OA with an ICER of SGD 110,000 per QALY gained. Treatment adherence and cost of hydrotherapy were main drivers of the cost-effectiveness findings.

Discussion & Conclusion:
Hydrotherapy is a cost-effective rehabilitation option for patients with MSDs (except OA) in the Singapore healthcare setting.

NR-01

Person-Centred Care – How Do We Fare? A Cross-Sectional Survey on Hospitalised Older Adults

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Background & Hypothesis:
Person-centred care (PCC) approach emphasises on the nurse-patient partnership, and incorporates patients' preferences and values into their care. It improves the quality of care and has many patient-reported benefits. PCC is a relatively new concept in Singapore. Hence, there is a need to establish a baseline on hospitalised patients' perceptions on its current status. We examined: 1) older adult inpatients' perceptions of how their individual needs were met by nurses, and 2) if the perceptions differed based on patients' characteristics and ward types. We hypothesised that patients who were younger, higher educated and from subacute wards would report higher PCC scores.

Methods:
This was a cross-sectional survey using the self-reported adjusted Individualized Care Scale-A (ICS-A) questionnaire (17 items). We recruited 200 inpatients aged ≥60 years from general acute/subacute wards in Tan Tock Seng Hospital who were post the acute phase. We used descriptive statistics and t-tests for data analyses.

Results:
The ICS-A scores were mean (SD): 39.24 (16.96). The scores were higher in patients aged <70 versus ≥70 (43.34 [18.09] vs 35.01 [14.50], P <0.0001); and in patients with higher education (42.47 [17.13] vs 36.65 [16.66], P <0.018). There was no difference in the scores of patients in acute versus subacute wards (39.70 [16.29] vs 38.71 [17.78], P = 0.68).

Discussion & Conclusion:
The inpatients' perceptions of their needs being met were poorer than Western literature. The findings lead the way in understanding the current status and serve as valuable insights to facilitate a PCC philosophy in nursing care. They highlight areas for improvements and the need for greater nurse-patient partnership, especially amongst the older and less educated patients.

NR-02

I am Part of the TTSH Family!

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Background & Hypothesis:
Singapore is facing a great challenge to meet the rising demand of nurses with a rapidly ageing population. The retention of such valuable human resource in the healthcare organisation has become paramount. Research has shown that a sense of belonging can be built by increasing interaction with others and participating in activities or events. High engagement has been proven to predict high organisational commitment and low turnover intention. A programme aiming to promote a sense of belonging through interactive activities among Asian Nursing Scholarship (ANS) students was implemented in TTSH.

Methods:
This programme comprises 2 main components: 1) Hospital orientation and tour when the sponsored students just arrived in Singapore; and 2) Essential to survival workshop prior to the start of the first school term in polytechnic, which includes activities such as team building, experience sharing from seniors, updates from the human resources department and an award presentation top English scholars. Social media such as TTSH's Facebook and Wechat were introduced as a communication platform.

Results:
A total of 61 students who participated in the programme were invited to complete an online survey. All of them felt welcomed and supported by the sponsored hospital (70% – strongly agree; 30% – agree). Through the analysis of narrative comments, sense of belonging and appreciation have emerged as the 2 main themes.

Discussion & Conclusion:
A supportive environment with strong interpersonal relationships can help students feel as though they are an integral part of the organisation. This programme has achieved its aim and more of such programmes will be implemented in the future.

NR-03

A Historical Research on the Role and Practice in Community Nursing in the Early Formative Years of Singapore

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Background & Hypothesis:
In recent years, a greater emphasis has been placed on nurses to provide care at home as a result of the changing demographics and the increasing focus on community care in Singapore. In order to understand the influence of various significant factors on the past and present practice of community nursing, a qualitative historical research was conducted to explore the roles of community nurses and the influencing factors.

Methods:
In-depth individual interviews were conducted with 13 participants who have provided nursing care at home from the year 1945 onwards. Snowball sampling was used. The interviews were audio-recorded and transcribed verbatim. Data from old archives were also collected. The data was organised using analytic software Nvivo 10. Concurrent thematic analytic method (data condensing, data display and conclusion drawing) (Miles, Huberman and Saldana, 2014) was used.

Results:
The themes derived demonstrated that in the past, the roles of nurses providing care at home was dependent on the organisation of health services, the population health needs, the physical environment factors, the perceptions of the roles by the nursing community, and the relationships between the nurse and the patients, or their families.

Discussion & Conclusion:
The findings are significant in understanding the contextual factors which have led to the current community nursing role development. These influences need to be considered in the planning of health and nursing services provided in the home environment. Further research is warranted to study the relevancy of these factors and their relationships on the current community nursing roles in the regional health system in Singapore.

NR-04

Angina Management is Poor after Percutaneous Coronary Intervention

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Background & Hypothesis:
Self-management of coronary heart disease (CHD) is critical after elective percutaneous coronary intervention (PCI). While elective PCIs should reduce patients' stable angina symptoms, recurring pain is a common problem post-procedure and effective self-management of this seemed poor. The aims of the study were to identify how patients self-managed their angina symptoms after undergoing PCI and to explore barriers to their effectiveness in this.

Methods:
This mixed-methods study used an explanatory, sequential design. In phase 1, quantitative data were collected from a convenience sample (n = 93) approximately 3 months after elective PCI using a validated self-administered survey tool. Quantitative data were subject to univariate, bivariate and multivariate analysis. Phase 1 findings were used to purposively select 10 participants from the original sample for interview in phase 2 of the study. Thematic analysis was used to analyse qualitative data.

Results:
Participants had a mean age of 66.25 years (SE ± 10.56), were mostly male (n = 70/75.3%) and Caucasian (n = 80/86%). After PCI, 74.2% (n = 69) of participants managed their angina symptoms inappropriately. Around 17% (n = 16) would summon an emergency ambulance to help them deal with any recurrence of symptoms, however slight or short-lived. Older age, the existence of comorbidities, low self-efficacy, lack of support from healthcare providers, less threatening perceptions of CHD, and fear compromised participants' effective self-management of angina symptoms.

Discussion & Conclusion:
Self-management of angina symptoms is suboptimal after elective PCI and a plethora of factors contribute to that. Careful evaluation of patients' self-management skills is required to inform effective self-management strategies.

NR-05

An Exploration of the Views of Psychiatric Nursing Clinical Instructors towards Teaching Reflective Journalling in Singapore

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Background & Hypothesis:
Reflective journalling has been considered integral to link nursing theory to clinical practice. The implementation of reflective journalling varied among nursing schools. Some schools advocated for it while others defer. In clinical settings, the utilisation of reflective journalling is yet a standard practice; hence the support and the teaching of reflective journalling among nursing clinical instructors had rarely been studied in Singapore. This study explored the views of psychiatric nursing clinical instructors towards teaching reflective journalling to nursing students on psychiatric postings.

Methods:
A qualitative and explorative approach was employed in the in-depth interview of 5 nursing clinical instructors selected via purposive sampling from a local mental health facility. Interview guide was content validated. Data was triangulated with observations of participants and reviewing reflective journals of students.

Results:
Thematic analysis of the data revealed themes of self-reflection, key requisites of reflective journalling and tedious nature of reflective journalling. The act of reflection was opined to be more valuable than the journalling itself. Key requisites of reflective journalling included prior reading before clinical supervision period, the degree of endorsement of reflective journalling by schools, students' prior experience with reflective journalling and the educational level of the students. Most clinical instructors believed students did possess a satisfactory level of reflective abilities.

Discussion & Conclusion:
This study informed clinical instructors on the need to expand their knowledge and understanding towards teaching reflective journalling and how reflective journalling can be further enhanced. Findings from the study will be used towards the recommendation of a reflective journalling framework for future implementation.

NR-06

Factors Influencing Quality of Life among Cancer Survivors: Using KNHANES 2010-2014

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Background & Hypothesis:
Due to an increase in cancer prevalence and live expectancy, the quality of life of cancer survivors after cancer treatment has become an issue. The purpose of this study was to identify meaningful predictors for quality of life among cancer survivors. Age, sex, educational level, economic status, time since diagnosis, comorbidity, activity limitation, and subjective health status were included as possible predictors.

Methods:
Data of 611 cancer survivors from the Korea National Health and Nutrition Examination Survey (KNHANES) from 2010 to 2014 were extracted to analyse factors influencing their quality of life. If participants had chronic diseases such as hypertension, hypercholesterolaemia, stroke, arthritis, asthma, depression, atopic dermatitis, kidney disease, they were considered to have comorbidities.

Results:
Survivors of stomach, liver, colon, breast, cervix, lung, tracheal, and thyroid cancers were included in this study. Among the entered variables, age, economic status, activity limitation, comorbidity, and subjective health status were statistically significant predictors. Activity limitation ($\beta = 0.26$, $P < 0.05$) was the strongest predictor followed by subjective health status ($\beta = -0.23$, $P < 0.001$), age ($\beta = -0.13$, $P < 0.01$), economic status ($\beta = -0.10$, $P < 0.05$), and comorbidity ($\beta = -0.07$, $P < 0.05$).

Discussion & Conclusion:
When developing and applying intervention programmes for cancer survivors, their level of activity limitation need be factored in. Moreover, survivors' comorbid conditions and socioeconomic status need to be considered when caring for them.

NR-07

Nurses as Second Victims after Adverse Events in Singapore

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Background & Hypothesis:
Adverse events that occurred can cause extensive physical and psychological effects on the patients and their carers. Whilst care and attention are focused on the patients and their families, the nurses involved may feel neglected. This study aimed to understand the experiences of local Asian nurses as second victims in an aftermath of adverse events.

Methods:
An exploratory qualitative research was carried out after obtaining ethics approval. Using purposive, theoretical sampling, 8 nurses were recruited from a public tertiary hospital in Singapore. Each participant was interviewed face-to-face. All data collected were transcribed and validated independently. Concurrently, thematic analysis was performed to analyse the qualitative data. The study ceased enrollment when the data were deemed to have reached saturation.

Results:
Six females and 2 males were interviewed with mean age of 30.8 years (SD = 9.5) years. Seven main themes emerged from data analysis. These were: 1) responding psychologically after the event, 2) feeling prejudiced by others, 3) having intrusive thoughts, 4) drawing valuable lessons from the event, 5) coping to recover after the event, 6) taking responsibility for mistakes made, and 7) finding one's identity.

Discussion & Conclusion:
This was the first study conducted on Asian nurses as second victims. The harmful effects of the adverse events on second victims were long lasting. It affected the nurses' lives. Female Asian nurses were more affected emotionally than their male counterparts. All the second victims used various coping strategies to recover. Future study is recommended to develop a context-appropriate second victim programme to support Singapore nurses.

NR-08

Symptom Burden of Palliative Care Oncology Patients Presenting to an Emergency Department

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Background & Hypothesis:
Palliative care focuses on good symptom control, reduction in suffering, and improving patients' quality of life. Early access to palliative care is important in meeting these goals. The Emergency Department-Palliative Care Service (ED-PALS) collaboration has been initiated in Tan Tock Seng Hospital since January 2015 to provide palliative care to oncology patients earlier in the care trajectory.

Methods:
A prospective, descriptive study was conducted to identify characteristics and symptoms of oncology patients with palliative care needs who are referred to the emergency department. Patients who satisfied screening criteria were reviewed on the same day or within 3 working days in a specially arranged palliative care "hot clinic". Patients' symptoms were assessed using the Edmonton Symptom Assessment Scale (ESAS).

Results:
Out of 70 referrals, 19 (27%) were referred to the "hot clinic" and 51 were seen in the ED on the same day. Of the 51 patients, 14 (20%) were discharged home from the ED, 32 (46%) were admitted, 3 (4%) died in ED, and 2 (3%) transited directly to a hospice. Top 3 cancer groups were lung (n = 18, 26%), colorectal (n = 14, 20%) and pancreas (n = 7, 10%). Top 3 symptoms were pain (n = 26, 38%), appetite (n = 23, 33%) and dyspnea (n = 14, 20%). Median PPS was 50%.

Discussion & Conclusion:
Oncology patients with palliative care needs commonly presented with pain, loss of appetite and dyspnea. Future studies should aim to look at improving the symptom scores of oncology patients presenting to the ED.

NR-09

Promoting the Older Adults' Function through the Reduction of Inappropriate Usage of Continence Aids

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Background & Hypothesis:
Older adults using continence aids tend not to mobilise when attending to their continence needs, thus leading to functional decline and overdependence on the continence aids. The purpose of this pilot study was to ascertain the impact of reducing the inappropriate use of continence aids on older adults' functions.

Methods:
The pilot was conducted in a 38-bedded medical ward. Interventions included weaning off diapers, sitting patients out of bed and prompting for early therapist referral.

Results:
A total 123 patients were included in the data collection; 50 of those patients were admitted before the pilot and did not receive any intervention while 73 were admitted after the pilot and received the intervention. With similar baseline demographics, results show that the intervened patients were 30% more likely to be weaned off diapers, and in the process, using 60% lesser diapers. More remarkably, 92% of intervened patients, in contrast to 24% of the patients in the control group, returned to their premorbid function ($P = 0.000$). The proportion of patients who had regained their independence was significantly higher in the intervention group compared to the control group (56% vs 26%, $P = 0.011$). Overall, the length of stay for intervened patients decreased sharply to 9.6 (from 14.8), saving the hospital 5.2 bed days per patient.

Discussion & Conclusion:
Incontinence is a major issue faced by most of our elderly clients in this unit. As we reduce their dependence on continence aids, this small sample of clients experienced greater dignity, autonomy and control over their continence needs.

NR-10

Exploring Older Male Adults' Perception of Using Condoms in the Department of Sexually Transmitted Infections Control (DSC) Clinic

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Background & Hypothesis:
The rates of sexually transmitted infections (STI) in older adults are rising. According to a large study published in the Journal of Sexual Medicine, older male adults seemed to have the strongest aversion to condoms. This study aims to understand the older male adults' perception of using condoms.

Methods:
A convenience sample study of male adults who were aged 50 and above and had attended the DSC Clinic from March 2016 to April 2016 was carried out. They were invited for an anonymous self-administered survey.

Results:
A total of 38 participants were surveyed. Majority of the participants were Chinese (89%). Seventy-one percent of them (n = 27) were married, 15.8% (n = 6) were single, 7.9% (n = 3) were divorced, and 5.3% (n = 2) were widowed. Out of those surveyed, 68.4% (n = 26) were working adults and 31.6% (n = 12) were retirees; 92.1% (n = 35) had sex other than their spouse while 52.6% (n = 20) had paid sex. Only 26.3% (n = 10) used condoms for protection. For those who were not using condoms, the reasons provided were due to "pleasure derived from sex", "am already old", "being drunk", and "partners who were clean". Out of 89.5% of older males, 26.3% of them admitted that they were aware of condom protection but were not using it. Only 60.5% (n = 23) participants had screened for STI /HIV within the past 1 year; 36.8% (n = 14) experienced same-day sex with strangers and 13.6% (n = 5) admitted to not wearing a condom.

Discussion & Conclusion:
Majority of older male adults would prefer to experience "pleasure" and forego the use of condoms. Targeted public education should be put in place to promote awareness on condom usage.

NR-11

Characteristics of Frequent Attenders to the ED for Asthma

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Background & Hypothesis:
Many asthma exacerbations are preventable. It is important to identify the characteristics of frequent attendees to the emergency department (ED) and recognise the key factors for appropriate interventions. The aim of the study is to describe the characteristics of patients with >3 ED visits for asthma exacerbation.

Methods:
A retrospective study of adult patients presenting to TTSH ED with asthma exacerbation within a 1 year period from 2014-2015 was carried out. Data including age, gender, ethnicity, medications, history of ED visits and hospitalisations, MSW follow-up and ED disposition status were retrieved from the asthma database.

Results:
A total of 1048 patients were included in the study; 945 (90.2%) patients had 2 ED visits or less and 103 (9.8%) patients had >3 ED visits. The mean age of patients with >3 ED visits was 38.3 yrs (SD: 14.4). There were no significant differences in gender and ethnicity. Patients with >3 ED visits were <61 years old of age. In multivariate logistics regression analysis, patients with previous history of ED visits for asthma ($P \leq 0.001$), had reattendance to ED for asthma within 30 days after discharge from ED ($P \leq 0.001$), and patients on follow-up by medical social worker ($P \leq 0.001$) were associated with >3 ED visits.

Discussion & Conclusion:
Interventions targeted to specific patient groups with social issues, reattendance to ED within 30 days, or with prior ED attendance within a year may be a strategy to reduce further ED utilisation.

NR-12

Maternal Plasma Concentrations of Vitamin D and Offspring Cognitive Development at 24 Months

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Background & Hypothesis:
While animal studies suggest that vitamin D may play a role in fetal brain development, data from human populations are scarce and inconsistent. In an Asian mother-offspring cohort, we examined the association between maternal plasma vitamin D 25-OHD concentrations during pregnancy and offspring cognitive development.

Methods:
We used data from 396 mother-infant dyads. Maternal plasma concentrations of 25-OHD was measured at 26 to 28 weeks gestation using LC-MS/MS. Infant development was assessed using Bayley Scales of Infant Development, third edition (BSID-III) at age 24 months. Associations between maternal vitamin D status and infant development were examined using multivariable linear regression.

Results:
A total of 34.8% (138 of 396) of mothers were vitamin D insufficient (25-OHD between 37.5 and 75 nmol/L) while 3.5% (14 of 396) were vitamin D deficient (25-OHD <37.5 nmol/L). Adjusting for potential confounding variables including maternal age, ethnicity and infant sex, maternal 25-OHD concentration was not significantly associated with cognitive, language, motor, social, and adaptive behaviour domains of BSID-III ($P \geq 0.05$). There were no statistically significant interaction effects by infant gender or ethnicity in fully adjusted models (all P interaction values >0.05).

Discussion & Conclusion:
Our results do not support an association between maternal vitamin D status and infant neurocognition. The lack of association observed in this study could be due its modest sample size and the low prevalence of vitamin D deficiency in our study population.

NR-13

Systematic Review on the Impact of Parental Cancer on Adolescent Children Aged between 12 to 18 Years

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Background & Hypothesis:
This review studies the impact of parental cancer on adolescents as they are at a higher risk of developing psychological problems with the cognitive ability to comprehend the emotional pain that their parent with cancer undergo.

Methods:
Inclusion criteria—primary studies (cross- sectional, cohort and qualitative studies); secondary studies (systematic review)—published between years 2002- 2016 in English; adolescents who have a parent with cancer—search strategy articles were searched from PsycINFO, Cochrane, ASSIA and ProQuest.

Results:
Twenty articles were retrieved and appraised with CASP tool as either low, moderate or high in quality. The studies were conducted in European countries, Canada and USA. 1) Adolescents' ways of coping: some adolescents positively cope through emotional and problem focused strategies while others use dysfunctional strategies to cope. 2) Emotional and behavioural problem manifestations: parent's recent and advanced cancer diagnosis affected adolescents and they exhibited feelings of uncertainty, helplessness and loneliness. They were worried that that their parent might die due to cancer, wondered if their ill parent would fully recover, and were afraid that they might inherit cancer. 3) Family communication: adolescents suppressed their emotions on parental cancer and hid it from their parents to protect them from worrying further. Consequently, parents lacked awareness about the adolescents' feelings of fear and worry related to parental cancer.

Discussion & Conclusion:
Study findings were relevant to support adolescents whose parent has cancer although no research was conducted in Asia. From the systematic review findings, the feasibility of implementing a support programme in Singapore hospitals will be explored.

NR-14

Evaluating Student Nurses' Clinical Reasoning Skills in a Simulated Deteriorating Situation: Development and Psychometric Testing of a Tool

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Background & Hypothesis:
With effective clinical reasoning, nurses can play pivotal roles in identifying and managing clinical deterioration. To ensure nurses are trained for competency in these skills, a robust assessment tool is required. Currently, however, there is a lack of such a tool.

Methods:
A prospective psychometric instrument validation design was undertaken. In phase 1, a 10-item CR tool was developed through literature review and expert validation. Phase 2 involved psychometric testing of the tool with a purposive sample of 15 year-2 and 15 year-3 nursing students from the National University of Singapore.

Results:
Content validity of the tool was high with a content validity index of 0.93. Construct validity of the CR tool was strong with the year-3 participants having significantly higher CR tool total scores than the year-2 participants ($P < 0.01$). A high correlation ($r = 0.71$, $P < 0.01$) was found between CR tool total scores and the Rescuing A Patient in Deteriorating Situations (RAPIDS) tool total scores confirming concurrent validity. The internal consistency of CR tool was high with a Cronbach's alpha of 0.92. The inter-rater reliability was strong with an intraclass correlation coefficient of 0.88 for CR tool total scores and 0.69-0.88 for the subscale scores.

Discussion & Conclusion:
The CR tool can be used to evaluate nursing students' clinical reasoning in a simulated deterioration scenario. Additionally, it can serve as a learning tool to guide nursing students to develop their clinical reasoning in recognising and managing clinical deterioration.

NR-15

Will Teenagers Today Live with and Care for Their Aged Parents Tomorrow?

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Background & Hypothesis:
Elderly Singaporeans who live alone are 1.7 times more likely to die prematurely as those living with family or friends, but there is a growing trend towards children staying apart from their parents. This study explored the willingness of teenagers to live with and care for their aged parents in the future and the reasons for their decision.

Methods:
We employed convenient sampling of 1405 secondary school students (Mage = 14.9 ± 1.30) attending a dementia outreach programme. A purpose-designed questionnaire was administered to elicit the students' understanding of and attitude towards ageing. A single, open-ended question elicited their willingness to live with and care for their aged parents. Thematic analysis was employed to understand the reasons for their choice.

Results:
Majority (83.3%) chose to live with their parents and the reasons fell into 4 categories: 1) desire to care, 2) expression of love, 3) sense of responsibility, and 4) prompted by moral values. Among those who opted not to live with their parents, the reasons included: 1) respect parents' preference, 2) desire for privacy, and 3) desire for independence and freedom. However, most students (85.8%) acknowledged that staying with elderly parents could pose challenges. The difficulties expressed included: challenges in communication (46.4%), conflicts due to different values and beliefs (33.5%), interference with family decision making (26.5%), and intrusion with family activities (18.8%).

Discussion & Conclusion:
Most teenage students opted to stay with their parents but also anticipated challenges. Efforts can be undertaken to address the challenges expressed to better sustain the family as the social safety net.

NR-16

Designing and Evaluating a Serious Game on Improving Nursing Students' Knowledge, Confidence and Skill Performance in the Safe Administration of Blood Transfusion: A Clustered Randomised Controlled Trial

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Background & Hypothesis:
Technological advances have given rise to serious gaming, which can optimise learning on the safe administration of blood transfusion in a safe virtual environment. This study aims to design and evaluate the effectiveness of serious gaming in enhancing knowledge, confidence and skill performance of nursing students in the administration of blood products.

Methods:
A clustered, randomised controlled trial was conducted on 103 second-year undergraduate nursing students. Students were randomised into control or experimental group based on their tutorial grouping. The experimental group underwent a blood transfusion game. The game involved processes of pre-, during- and post-blood transfusion. Multimedia instructional materials for knowledge acquisition and formative assessment through mini-games specific to game objectives with real-time feedback were included. Pre- and post-tests through knowledge and confidence questionnaires were conducted. Experimental group participants evaluated their learning experience through a survey. Two weeks later, participants' blood transfusion skill performance was assessed in a simulated environment.

Results:
The experimental group demonstrated significant improvement (P <0.001) in post-test knowledge and confidence scores. Group comparisons indicated that the experimental group had significant improvements in postknowledge (P <0.001) and confidence scores (P <0.001). Results show no significant difference (P = 0.105) in skill performance between groups. Experimental group participants rated the serious game positively.

Discussion & Conclusion:
This study revealed the effectiveness of serious games in enhancing knowledge and confidence of students, but not skill performance. Serious gaming provides an innovative way to optimise learning when blended with hand-on simulation. Future study can evaluate this blended learning to improve nursing competencies in the safe administration of blood transfusion.

NR-17

Examining the Effects of a 2-Day Preceptor Course on Preceptors' Preparedness for Their Role as Preceptors: A Quasi-Experimental Study

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Background & Hypothesis:
Due to the ageing population, demands for healthcare services and trained nurses will rise. This warrants skilled and well prepared nurse preceptors to orientate new nurses. However, the effects of existing preceptor training in preparing nurses to assume the preceptor role is unknown. This study aimed to examine effects of a preceptor course on preceptors' preparedness through: 1) preceptor's self-reported change in competence, confidence and comfort in precepting new nurses, and 2) preceptor's self-reported change in knowledge, skills, attitude and self-efficacy.

Methods:
This was a quasi-experimental study conducted in a tertiary hospital in Singapore. We consecutively recruited all nurses who attended the institution's Preceptorship Course conducted between October 2015 and January 2016. Data was collected using a self-reported questionnaire administered before and after the preceptor course. The Preceptor Survey and Preceptor Programme Educational Outcomes Scale were used.

Results
A total of 101 (100%) preceptors were recruited. Overall, the findings demonstrated the effectiveness of the preceptor course in enhancing preceptors' self-reported competence (mean difference 1.90 ± 1.31, $P < 0.001$), confidence (mean difference 2.02 ± 1.58, $P < 0.001$) and comfort (mean difference 1.94 ± 1.50, $P < 0.001$). Preceptors also reported high postcourse knowledge, attitude, skills and self-efficacy.

Discussion & Conclusion:
This study provides valuable insights to understand the preceptors' perspective regarding their self-perceived preparedness for the role, and reinforces the need for healthcare institutions to recognise the importance of preceptor training programmes. Future studies could examine long-term impacts of preceptor training such as in the retention of new nurses.

NR-18

Predictors of Medication Adherence among Inpatients with Schizophrenia

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Background & Hypothesis:
Schizophrenia is often marked by frequent relapses. Non-adherence to antipsychotics is a major contributor. Though medication non-adherence is a concern, the lack of updated literature review regarding influencing factors of adherence and scarcity of local research warrants a study. This study aims to review the literature for factors influencing medication adherence and validate these factors in a local study that examines the predictors of adherence among patients with schizophrenia.

Methods:
In phase 1, a comprehensive literature review was conducted on nursing and medical databases using specific keywords and predetermined search criteria to identify factors influencing adherence. Thereafter, a preliminary cross-sectional, correlational study was conducted on a convenience sample of 92 adult inpatients with schizophrenia from 2 tertiary psychiatric hospital. Patients, after having their informed consent taken, completed the validated Morisky Medication Scale (MMAS-8), Self Appraisal of Illness Questionaire (SAIQ), modified Social Support Network Inventory (SSNI) and 4-Point Ordinal Alliance Self-Report (4PAS).

Results:
Six factors: awareness of illness (insight), history of medication adherence, attitude towards medication, types of atypical antipsychotics, less severe psychotic symptoms, and social support were identified as influencing factors of adherence in the literature. However, these factors were found to be non-significant predictors of adherence in the local population.

Discussion & Conclusion:
Contrary to the literature, though factors such as insight could influence adherence in patients with schizophrenia, comprehensive research with a larger homogeneous sample is needed to determine the predictive factors. Until then, current intervention such as psychoeducation to enhance the factors could be employed clinically to enhance adherence.

NR-19

Registered Nurses' Attitudes and Knowledge of Managing Alcohol Withdrawal in a General Hospital in Singapore

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Background & Hypothesis:
Based on the Singapore National Mental Health Study, alcohol abuse occurs in 3.5% of the local population and 0.5% are dependent users. Alcohol withdrawal (AW) occurs in 15% to 20% of hospitalised patients. This study aims to understand: 1) registered nurses' knowledge, attitudes and practices in managing AW and 2) main challenges faced by registered nurses when managing such patients.

Methods:
Registered nurses who were working in inpatient high-volume wards in Tan Tock Seng Hospital were invited to participate in the study. Surveys done were voluntary and anonymous.

Results:
A total of 356 survey questionnaires were distributed and 94% of them were completed and returned. Out of those surveyed, 151 (42%) nurses were aged 25-30 years and 48.2% had less than 5 years' experience; 282 (85%) felt that learning to manage AW should be part of their core training and is a valuable skill to learn, while 70% (n = 250) of nurses did not feel competent in managing AW. However, two-thirds felt it was part of their job scope. Ninety percent of the nurses reported their interest to undergo further training, of which 76% reported a specific interest in the areas of acute management, identifying those at risk, and long-term management. Availability of protocol/guideline (through online access), coupled with education and training, were deemed helpful. Classroom teaching and on-the-job training were some of their suggestions in order to bridge the gap in their knowledge.

Discussion & Conclusion:
By identifying areas of difficulties faced by registered nurses, more specific and appropriate areas of intervention can be developed to improve the standard of care received by patients.

PCR-01

To Increase Patients' Awareness on Postoperative Care of Dental Fillings

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Background & Hypothesis:
One of the common causes of dental filling dislodgement is the lack of postoperative care. A survey conducted in April 2014 revealed 70% of the 20 respondents were not aware of how to care for their fillings. Most patients were not given adequate postoperative care instructions. The study aims to increase patients' awareness on postoperative care of dental fillings by the introduction of patient education material.

Methods:
The team designed an educational material on postoperative care of dental fillings as there was no material available for patients on how to care for their fillings. A self-administered questionnaire was designed to find out patients' awareness on postoperative care of dental fillings. A sample of random 20 patients who have had dental fillings done were interviewed before and 3 weeks after introduction of the educational material to identify any difference in patients' awareness on postoperative care of dental fillings.

Results:
There was an increase from 30% to 100% of patients who were aware of how to care for their dental fillings after the educational material was introduced.

Discussion & Conclusion:
The implementation of the educational material would reduce the occurrence of dislodged fillings resulting from patients' lack of awareness of how to care for their fillings. This would also reduce the chance of dental complications resulting from dislodged fillings. This educational material has been used in 4 other dental clinics to achieve standardisation of postoperative materials. Further studies can be done to find out the effectiveness of such educational materials and if awareness translates into practice.

PCR-02

An Update of Clinical Outcomes from Pharmacist-managed Hypertension, Diabetes and Lipids Clinic in Primary Care

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Background & Hypothesis:
Pharmacists running the Hypertension, Diabetes and Lipids Clinic (HDL-C) at National Healthcare Group Polyclinics provide drug optimisation for patients with diabetes, hypertension and dyslipidaemia. Previous data has shown the effectiveness of the HDL-C. It is hypothesised that the HDL-C continues to be effective in improving clinical outcomes.

Methods:
A retrospective, single-group study was conducted on 118 patients with 2 or more visits to the HDL-C in 2015. Glycosylated haemoglobin (HbA1c) and blood pressure (BP) were collected at 3 time points at 3- to 6-monthly intervals. Low-density lipoprotein (LDL) cholesterol was collected at 2 time points at 6- to 12-monthly intervals. The Friedman test was used to compare clinical parameters. Generalised estimating equations (GEE) were used to examine the effects of other variables on clinical outcomes.

Results:
Sixty-one percent of patients showed improvement in HbA1c. There was a statistically significant improvement in HbA1c from 9.1% to 8.86% (P <0.001). Significant improvements in systolic BP from 131.36mmHg to 128.85mmHg (P <0.001) and diastolic BP from 71.41mmHg to 69.63 mmHg (P <0.001) were observed. There was a statistically significant decrease in LDL cholesterol from 2.39mmol/L to 2.27mmol/L (P <0.001). GEE showed that HbA1c and LDL levels were not significantly associated with age, gender, race or number of visits to HDL-C and whether the patient had attended the HDL-C before (P >0.05).

Discussion & Conclusion:
The HDL-C is effective in improving clinical outcomes. These findings are consistent with previous studies. HDL-C pharmacists have a valuable role in the multidisciplinary healthcare team involved in the management of these chronic diseases.

PCR-03

Pharmacy Technicians' Satisfaction with Job Scope and Impact of Career Framework Redesign in Primary Care

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Background & Hypothesis:
Following the Ministry of Health directive to redesign pharmacy technician's (PT) job scope, 4 new career tracks were developed within National Healthcare Group Pharmacy (NHGPh). Roadshows were conducted to communicate the revised career framework to all PTs. It is of interest to determine the level of PT's satisfaction with their roles and how the revised framework has impacted them.

Methods:
An online survey was sent to all PTs at NHGPh. Job satisfaction was measured using a 5-point Likert scale. PT attrition and promotion rates were obtained from the Human Resource Department. The Spearman's rank-order correlation was used to determine the strength of association between variables.

Results:
There were 156 respondents; 49.3% had been with NHGPh for 1-5 years; 98.7% were familiar with their current roles; 77% knew what job expansion roles were available to them. The mean satisfaction score was 3.5 (SD + 0.84) out of 5; 80.8% did not feel that they were given too many responsibilities. There was a non-significant decrease in satisfaction with number of years worked ($P = 0.4$). PTs who had a recent increase in their job grade were more satisfied ($P = 0.87$); 29% wanted more clinical or managerial roles. PT attrition rate decreased from 14.01% to 12.67% (financial year 2014 to 2015). Since July 2015, 19.2% of senior PTs were promoted to PT executives.

Discussion & Conclusion:
Job redesign improved PT attrition rate slightly, and provided them with greater opportunities for promotion. More can be done to improve PT job satisfaction. Managerial or leadership roles can be explored.

PCR-04

Healthcare Closer to You − National Healthcare Group Mobile Community Health Centres for Diabetes

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Background & Hypothesis:
The prevalence of diabetes is increasing locally. Many of these patients are managed by their general practitioner (GPs). To improve the quality of care of diabetic patients in the community, National Healthcare Group (NHG) set up a mobile Community Health Centre (CHC) to improve access to services for diabetic patients on follow-up with their GPs and the inpatients in the Institute of Mental Health (IMH). The objective of this study is to describe the work done by the mobile CHC over the past 1.5 years.

Methods:
Patient data recorded in the Clinic Assist software used on the mobile CHC from 3 November 2014 to 30 April 2016 as part of service delivery was collected and reviewed for purposes of this study.

Results:
In the above-mentioned period, the mobile CHC served 422 patients managed by 50 GPs including IMH. The age group ranged from 26 to 94 years old and 57.6% were male; 344 diabetic eye retinal photography, 277 diabetes foot screening and 11 nursing counselling were done during this period of time. All patients (100%) were satisfied with the services provided by the mobile CHC.

Discussion & Conclusion:
The mobile CHC has improved the quality of care provided by GPs and IMH by increasing access to diabetic foot and eye screening and improved education by the nurse. Publicity on the importance of regular eye and foot screening on the mobile CHC will increase the awareness of the GPs to provide better care for their diabetic patients through assistance from NHG's mobile CHC.

PCR-05

Validating the Interventions in Reducing the Number of Dislodged Fillings in Dental Clinics as Being Effective

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Background & Hypothesis:
When a filling falls out of a tooth (dislodged), the patient suffers from sensitivity and is dissatisfied with the outcome. This study aims to validate the introduced interventions as being effective in reducing the occurrence of dislodged fillings in dental clinics.

Methods:
Pre-intervention data from Woodlands Dental Clinic (WDL) (January to May 2014) was studied and the possible causes for dislodged fillings were identified. Interventions including manuals, a pictorial postoperative care education material and defined roles for communication between dentist and dental assistant, were introduced in May to July 2014. Four other dental clinics namely in Ang Mo Kio (AMK), Hougang (HOU), Jurong (JUR), and Toa Payoh (TPY) subsequently introduced the interventions in February 2015.

Results:
The results collected from WDL from August 2014 to July 2015 showed significant difference between the mean number of dislodged fillings before intervention (mean = 3.00, SD = 1.50) and after intervention (mean = 1.21, SD = 1.10, P = 0.003). A detailed pre-intervention (April 2014 to February 2015) and post-intervention (March 2015 to April 2016) analysis showed that the mean permillage of dislodged fillings after spread of 6.0‰ is significantly lower than the mean permillage of dislodged fillings before spread of 8.1‰ (P = 0.049) at AMK, and the mean permillage of dislodged fillings after spread 3.8‰ is significantly lower than the mean permillage of dislodged fillings before spread 6.3‰ (P = 0.044) at JUR.

Discussion & Conclusion:
This study ascertained that manuals, pictorial postoperative care education material and improved communication between dentist and dental assistant can reduce the occurrence of dislodged fillings in dental clinics.

PCR-06

ACGME Core Competencies – How Much do Primary Care Physicians Know in Singapore?

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Background & Hypothesis:
The Residency postgraduate training programme was introduced in 2010 when it was reformed and structured along the lines of the US residency model to produce more highly trained doctors. Ministry of Health collaborated with the Accreditation Council of Graduate Medical Education (ACGME) to develop a structured formative training. National Healthcare Group Polyclinics had adopted these 6 ACGME core competencies in the training of doctors. We aimed to assess primary care physicians' knowledge of ACGME 6 core competencies, namely: 1) medical knowledge, 2) patient care, 3) professionalism, 4) communication skills, 5) practice-based learning, and 6) systems-based learning.

Methods:
Participation was voluntary and kept anonymous. All physicians with the Graduate Diploma of Family Medicine, or Master of Family Medicine were invited to participate in this survey. The self-completed questionnaires were distributed via each clinic key trainer, who would collect the completed questionnaires and return them to the principal investigator for analysis.

Results:
A total of 56 questionnaires were completed; 46% were family physicians who had obtained the Master of Family Medicine. Thirty-two percent of the physicians had worked in this organisation for more than 10 years; 48% were familiar with the competencies. Only 18% were able to name all the 6 core competencies correctly. Patient care and professionalism were most frequently identified. Systems-based practice and practice-based learning were the least identified while 32% were familiar in applying these competencies in the evaluation of the trainees.

Discussion & Conclusion:
Patient care was recognised as the most important competency. There is a pressing need to educate the physicians to enhance their applications of these competencies in training.

PCR-07

Reducing Asthma Exacerbations in Yishun Polyclinic

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Background & Hypothesis:
Asthma is a common chronic disease – around 300 million people currently have asthma. In Singapore, almost 3500 disability-adjusted life years are lost due to asthma. The fatality rate for Singapore is 16 per 100,000 asthmatics. Patients with good control of asthma should have no exacerbations and no need for nebulisation. As such, nebulisation-rate (neb-rate) is used as the ultimate "outcome measure" of asthma control in our primary care setting — Yishun Polyclinic.

Methods:
A systematic approach using the National Healthcare Group's (NHG) Clinical Practice Improvement Programme (CPIP) allowed for multidisciplinary approach to asthma improvement. Our "root cause" analysis identified usage of inappropriate inhaled corticosteroids (ICS) as the main culprit – especially low dose ICS and non-generic expensive ICS. Interventions were implemented to change the prescribing habits of doctors. The outcome of each intervention was studied and acted upon, according to the Plan-Do-Study-Act (PDSA) model.

Results:
Inappropriate MDI usage was decreased from 35% to 17% and this improvement is maintained even now (1 year later), however, we failed to achieve a sustained improvement in neb-rate.

Discussion & Conclusion:
Further analysis to discern the "vital-few" root-causes is needed. Improving clinical "outcome measure" (such as neb-rate) is not easy. There are complex interactions between many causes and the "vital-few" root-causes can be elusive. Our next step is to re-evaluate our Ishikawa Diagram in light of insights gleaned from our PDSA cycles.

PCR-08

Effectiveness of Telemedicine for Distant Wound Care Advice towards Patient Outcomes: Systematic Review and Meta-Analysis

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Background & Hypothesis:
Telemedicine in wound care allows communication between the general practitioner and specialist, thus effectively reducing the wait for specialist and allowing the patient to get treated faster. As patients with complicated wounds increased, the demand for specialist wound advice increased but there are limited resources in this area in our polyclinics. A review was necessary as the outcomes measured varied widely in many studies with inconsistent evidence on its clinical effectiveness. The aim of this review is to evaluate whether the use of telemedicine for distant wound care advice is effective in improving wound outcomes through meta-analysis of the combined trials.

Methods:
Database searches were performed in Medline, Embase and CINAHL. Study methodologies were assessed using JBI-MASTARI.

Results:
Four randomised controlled trials and before-and-after studies involving 319 wounds were involved in the meta-analysis and studies were of low to moderate risk of bias. Though there was an increase in wound healing/improvement rate in the interventional group, there was high heterogeneity ($I2 = 87\%$) between studies and random-effect model showed it was non-significant (RR 1.47, CI 0.75 to 2.87, $P = 0.26$). Results of one trial was biased with unadjusted baseline characteristics and removal of that trial from the analysis showed low heterogeneity ($I2 = 43\%$) with fixed-effect model showing a significant increase in wound healing rate in the telemedicine group (RR 1.80, CI 1.23 to 2.63, $P = 0.002$).

Discussion & Conclusion:
Our review suggests that the use of telemedicine in wound care could effectively improve clinical outcomes.

PCR-09

Exploring Patients' and Caregivers' Perceptions of Managing Wound at Home for Patients with Simple Acute Wound in the Primary Healthcare Sector

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Background & Hypothesis:
To promote greater patient empowerment and responsibility, patients with simple acute wounds are encouraged to perform their wound care at home. Currently, only about 35% of patients with simple acute wound are performing self-wound care. This study aimed to explore patients' perceptions towards performing wound care at home and patients' attitudes towards attending an educational self-wound care programme.

Methods:
A qualitative methodology utilising the constructivist grounded theory approach was adopted in this study. Data collection was by in-depth semi-structured interviews. Six males and 3 females, ranging from 25 to 80 years old were recruited from 2 polyclinics using purposive sampling approach.

Results:
Main themes influencing patients' decision were patients' personality/characteristics and environmental factors. All were willing to perform self-wound dressing but felt that elderly and patients with limited mobility should not do self-dressing. Even with caregivers, most patients were reluctant to let caregivers do the dressing as they feared adding burden to the caregivers. Not doing the procedure correctly leading to wound deterioration was the fear felt by most patients. Some patients preferred having their dressing done in polyclinics because they felt it was cleaner than their home. The flexibility in schedule and the ability to change the dressing immediately when soiled encouraged patients to do self-dressing. Most patients expressed that the educational programme is beneficial as the knowledge would remain with them for a lifetime.

Discussion & Conclusion:
Patients' acceptability of the self-wound care concept offer promising potential for introducing a new mode of healthcare delivery such as the tele-wound care programme.

PCR-10

Effectiveness of Nutrition Education Accompanied by Cooking Demonstration on Healthy Eating Behaviour: A Follow-up Study

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Background & Hypothesis:
There is a rising trend in the prevalence of obesity and diabetes in Singapore. A previous study has shown that nutrition education accompanied by cooking demonstrations had a positive impact on delivering health promotion messages to encourage healthy eating practices. This is a follow-up study to evaluate if the intervention was effective in changing healthy eating behaviour.

Methods:
From May to July 2015, 1493 participants participated in the original study at Bukit Batok Polyclinic. A random sample of 306 participants were selected and interviewed through the phone by two trained interviewers 3 to 6 months after the initial study. Behavioural change was measured in terms of whether participants had increased their consumption of healthier food, in particular whole-grain foods. Demographics of participants were collected and compared.

Results:
Two hundred and fourteen (70%) participants increased their whole-grain intake and 239 (78%) participants increased their consumption of Healthier Choice Symbol (HCS) products. A total of 300 (98%) participants were willing to pay more for whole grains and 283 (92%) participants would opt for whole grains if they were available when eating out. Overall, 258 (84%) participants made positive changes after visiting the HC. Those who made positive changes were younger (mean age: 58.0 years) compared with those who did not (mean age: 61.0 years), and this was statistically significant ($P = 0.035$).

Discussion & Conclusion:
Incorporating cooking demonstrations alongside nutrition education is effective in inculcating healthy eating practices and changing self-reported eating habits in the short-term. Further research is needed to determine if this change is sustainable in the long run.

PCR-11

Behavioural Determinants of a Patient's Expectation of a Good Consultation in Polyclinic

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Background & Hypothesis:
A good consultation is central to clinical practice in primary healthcare. It is subjective and differs between cultures and population settings. This study examined various aspects of the doctor's interpersonal skills during a consultation and its association with a patient's expectation of a good consultation.

Methods:
Doctor consultations for patients aged 21 years of age or more in Toa Payoh Polyclinic were observed and behaviours were recorded. An interviewer-assisted patient completed questionnaire was administered to the patient after consulting the doctor. The patient's expectation of a good consultation was a dichotomous outcome measured as part of the questionnaire.

Results:
A total of 203 patient-doctor consultations were observed; 92% of the patients who responded felt that the visit fulfilled their expectation of a good consultation. The patient's perception of a good consultation was significantly associated with a clear explanation of the patient's condition and the perception of enough time spent with the patient. Patient's perception of a knowledgeable doctor, typing during consultation, closed-ended questioning and using medical jargon were not associated with the patient's expectation of a good consultation.

Discussion & Conclusion:
Patients expect a clear explanation of their medical condition and a perception of enough time spent during the consultation. Unlike other studies, many behaviours affecting communication such as the use of medical jargon, closed-ended questions and typing during consultation do not affect the patient's expectation of a good consult locally. These insights will help family physicians enhance their relationship with their patients.

PCR-12

Temporary Use of Basal Insulin at Different Time-Point Postdiabetes Diagnosis and Pancreatic Beta-Cells Function Maintenance – A Case Series

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Background & Hypothesis:
There is growing evidence on the temporary use of insulin therapy in newly diagnosed type 2 diabetes mellitus (T2DM) in the maintenance of pancreatic beta-cells function. There is a lack of literature on this in T2DM who failed oral therapy at different duration and age postdiagnosis.

Methods:
This is a retrospective review of 3 cases on temporary insulin therapy use in patients who failed oral therapy, at different duration and age postdiagnosis.

Results:
Case 1: A 50-year-old male with HbA1c 19% on diagnosis. Metformin and glipizide were started and titrated to 850 mgTDS and 10 mgBD in 12 months but HbA1c still ranged 11.1%-14.1%. Subcutaneous insulatard was initiated with doses 8-12U ON, resulted in HbA1c of 7%. Insulin was stopped 1 year after. HbA1c maintained at 6.1%-7.1% with glipizide 5 mgOM and metformin 500 mgBD throughout 40 months follow-up without insulin. Case 2: A 48-year-old female with HbA1c of 8.8%-9.9%, 15 years postdiagnosis. Subcutaneous insulin analog (Glargine) was initiated and maintained at 6U ON for 2 years, resulted in HbA1c of 7.1%-7.5%. A good HbA1c level of 6.9%-7.3% was maintained 9 months after stopping insulin. A rebound of HbA1c was subsequently noticed with HbA1c of 8.1%-8.4%. Case 3: A 70-year-old male with HbA1c of 10.2%-11.4%, 15 years postdiagnosis. Subcutaneous insulatard was initiated and maintained at 6-14U ON, resulted in HbA1c of 6.9%-7.3%. Soon after insulin was stopped, HbA1c rebound to 8.4%-9.2%.

Discussion & Conclusion:
Temporary insulin use with beta-cells function maintenance likely presents at the early stage of DM diagnosis and at younger age. A lower peak of glycaemia was observed in cases 2 and 3 despite rebound hyperglycaemia after stopping insulin.

PCR-13

Primary Care Practitioners' Perspectives of Using Electronic Medical Records in Their Daily Practice

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Background & Hypothesis:
With the advent of information technology (IT), paper medical records have been replaced by electronic medical records (EMR) in the primary care setting. The potential benefits of IT and the Internet to medical care are well recognised, as EMR improves patient safety, quality, and efficiency of patient care and reduces healthcare delivery costs.

Methods:
This study was done in National Healthcare Group Polyclinics (NHGP) to explore the physicians' perceptions and common or shared experiences with using EMR in their daily practice, utilising the theoretical framework of phenomenology. Using purposive sampling, Individual face-to-face interviews were conducted with NHGP physicians. All the interviews were audio-taped and transcribed verbatim. Thematic analysis was performed through the process of coding to create and establish meaningful themes.

Results:
Analysis of the data illuminated 3 key themes: 1) Participants' perceived advantages of the EMR, 2) participants' unpleasant experiences with the EMR, and 3) how the participants are adapting to the EMR. Based on the interviews with the participants, 4 key advantages were identified, namely improved documentation, better continuity of care, improved patient safety and multifunctional uses of the EMR. Participants discussed unpleasant experiences with the EMR relating to system issues, support issues, impact on patients and physician's health. Most of the physicians felt that EMR implementation is a necessary process and generally cope well after getting familiar with the system.

Discussion & Conclusion:
This is the first local study to explore primary care physicians' experience in using EMR. It gives insights to "user perspectives" of EMR.

PCR-14

Simulated Clinical Documentation Audit Process to Evaluate Clinicians' Agreement and Differences (Phase 1)

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Background & Hypothesis:
Clinical documentation (CD) is an important routine in the patient care process and is also a medico-legal document if disputes arise between a patient and healthcare provider. The study investigates the difference in perceived value and expectation of CD between clinicians; of interest, the physiotherapy documentation is studied.

Methods:
The study was conducted from April 2015 to July 2015. The Kotter's 8-step of transformation was used to guide and initiate changes on physiotherapy CD. A mixed-methods approach is used in this study to assess the physiotherapists' level of agreement with Fleiss kappa (quantitative) and similarities in written feedback (qualitative) with 9 completed CDs blinded and computer-randomised into 8 different orders. A simulated documentation audit process was then carried out involving 8 physiotherapists.

Results:
There were slight agreement on 3 of the 6 subjective components (pain score, aggravating/relieving factors and condition-specific question), kappa = 0.14 to 0.19, 95% CI, 0.05 to 0.28, P <0.005, while there were slight to moderate agreement on 4 of the 8 objective components (joints, muscle length, special test and neurological test), kappa = 0.12 to 0.5, 95% CI, 0.03 to 0.59, P <0.01. The review plan component showed slight inter-rater agreement, kappa = 0.17, 95% CI, 0.09 to 0.25, P <0.001. Other assessment's components and plan components had poor agreement (P >0.05). The qualitative analysis found common expectation about CD (vital information) and minor differences (depth of audit), such as pain and clinical reasoning.

Discussion & Conclusion:
The study found inter-rater agreement on <50% of CD audit components but similar qualitative comments, with the latter likely to be more useful for standardised audit.

PCR-15

Achieving Optimal Storage Temperature for Medications

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Background & Hypothesis:
Medications require proper storage to maintain their efficacy, and one determinant is the temperature at which they are stored before being dispensed or administered to patients. Much emphasis has been placed on cold supply chain for temperature-sensitive medications but there is no monitoring of medications that are stored at room temperature, which is commonly defined as 15°C to 25°C, maximum up to 30°C.

Methods:
A temperature study was conducted across 9 NHG Polyclinics in the rooms where daily observed therapy (dot), treatment, women's health screening (whs), immunisations and diabetic retinal photography (drp) are carried out. The study aimed to ascertain whether the storage temperature for the medications was optimal. Temperature logger was placed in the storage areas to record hourly temperature automatically for 2 weeks and the data was scrutinised for outliers.

Results:
All (100%) of the 9 polyclinics attained storage temperatures higher than the desired range for DOT rooms and treatment rooms; 89% (8 polyclinics) failed for WHS rooms, 44% (4 polyclinics) failed for immunisation rooms and 11% (1 polyclinic) failed for DRP rooms. Several countermeasures were put in place to enable optimal storage of medications in the respective service rooms.

Discussion & Conclusion:
Without the use of 24 hour air-conditioning, our tropical climate makes it a challenge to attain optimal storage temperature for medications. To ensure medication safety and accuracy, healthcare staff need to adopt counter-measures coupled with bi-annual temperature study to ensure that they are meeting recommended medication storage requirements.

PCR-16

Effectiveness of Follow-up Telephone Call to Improve Asthma Patients' Appointment Uptake

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Background & Hypothesis:
Patients presenting with acute exacerbation of asthma are often treated with nebulisation at primary healthcare. Studies have indicated that follow-up care within 1-2 weeks helps to prevent adverse outcomes such as emergency department visit and hospitalisation. Despite this, defaulter rates for follow-up care remain relatively high.

Methods:
An evaluative study was conducted to examine whether a follow-up call by nurse or care coordinator (CCs) can improve the follow-up rate after nebulisation at a single polyclinic from May to July 2015.

Results:
A total of 78 patients had nebulisation during this period. Patient profiles showed there were 43% Chinese, 32% Indians and 23% Malays. Successful follow-up call was made to all patients except 17% who were not contactable. A total of 31% of the patients came for their follow-up appointment while the remaining 69% defaulted. Out of the defaulters, 2 patients were seen at emergency department for acute exacerbation within a month and three returned for repeat nebulisation in the clinic.

Discussion & Conclusion:
Effective follow-up is important to prevent adverse asthma outcomes. Follow-up call by nurses or CCs might improve the follow-up rate among some patients. However, more interventions and research is required to improve the follow-up rate to 100%.

PCR-17

An Evidenced-based Project to Enhance Registered Nurses Care for Neonatal Umbilical Cord Stump in Hougang Polyclinic

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Background & Hypothesis:
Neglecting and improper umbilical cord stump care is detrimental to a newborn's health and well-being even in developing countries. Omphalitis or cord stump's infection attributed to 3 million newborn deaths worldwide. With this significant neonate's health risk, our team determines to evaluate practice and utilise evidence to reduce or eliminate this significant newborn's health risk.

Methods:
This project utilised Joanna Briggs Institute's Practical Application of Clinical Evidence System (PACES) and Getting Research Into Practice (GRIP) module to conduct pre- and postimplementation audit using 4 out of 5 audit criteria on 14 registered nurses from March 2015 to November 2015. Strategies implemented in between audits to improve clinical practice were provision of education with evidence-based rationale and clinical field mentoring in a non-intimidating environment which allowed open communication.

Results:
Pre-implementation audit revealed >70% adherence rate for criteria 1 to 3 and postaudit nurses achieved 100%. Statistically significant improvement was seen in Criteria 4: parent/caregiver folded nappy down during subsequent clinic's visit, nurses scored 71% during postimplementation audit compared to 14% adherence rate in pre-implementation audit.

Discussion & Conclusion:
Overall improvement in every audit criteria has shown that the role of JBI-PACES and GRIP can be successfully integrated in the polyclinic setting. Nurses' practice is enhanced by defining important components of effective evidence-based neonatal umbilical cord care and implementing strategies to address barriers on the ground promote nurses utilisation of evidence into their ever challenging clinical practice.

PCR-18

Evaluation on the Effectiveness of Group Diabetes Education Compared to Individual Diabetes Education

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Background & Hypothesis:
Diabetes education contributes to positive patient outcomes. This study aims to investigate the effectiveness of a structured group education (GE) delivered by a care manager and dietitian collaboratively using Diabetes Conversation Maps compared with individual education (IE).

Methods:
A convenient sampling of patients with newly diagnosed type 2 diabetes was assigned to GE or IE. Sixty-three patients (33 from GE; 30 from IE) who completed the study were included in the analysis. Validated questionnaire on self-care, illness belief, satisfaction and psychosocial were administered at baseline and 12-months. HbA1c was used to assess metabolic control. Non-parametric statistical tests were employed to evaluate within-intervention effect and intervention effect between the 2 groups.

Results:
Patients in GE were more satisfied than patients in IE (100% in GE; 86.67% in IE) and the difference between groups was significant ($P = 0.046$). On average, GE patients tested their blood sugar 0.33 days/week (95% CI, 0.01 to 0.66) more at 12-month. Emotional distress score in patients from GE significantly reduced at 12-months (mean = -6.86, 95% CI, -12.60 to -1.11). Patients from both groups score significantly higher in illness coherence items at 12-months (mean = 18.18, SD = 3.03 for GE; mean = 17.70, SD = 3.24 for IE), compared to baseline which indicates better understanding of diabetes. The difference between groups was not significant ($P = 0.638$). HbA1c decreased significantly in both groups (mean = -1.31% for GE; mean = -1.9% for IE) at 12-months but difference between group was not significant ($P = 0.163$).

Discussion & Conclusion:
A structured group education for newly diagnosed type 2 diabetes patients resulted in greater patient satisfaction, improved self-care, better understanding of diabetes and reduced emotional distress. Future study should investigate the cost-effectiveness of GE vs IE.

PCR-19

The Usefulness of Health and General Clinic Information Topics in Polyclinic TV Screens for Patient Education

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Background & Hypothesis:
A patient spends approximately 10 to 60 minutes waiting in the polyclinic. This can be an opportunity to educate them on health and general clinic information (HGCI) by using polyclinic TV screens. The purpose of this study was to understand the effectiveness of TV screens for the health education of patients, and to obtain feedback from the viewers on the video content, based on their needs.

Methods:
Ninety-three patients participated in a survey conducted during 6-13 November 2016, at Woodlands Polyclinic.

Results:
Of those surveyed, 75% (70 out of 93) noticed the video clips, of which 80% (56 out of 70) noticed those on HGCI. Of these, 63% (35 out of 56) and 66% (37 out of 56) found the videos useful and interesting respectively. Those who did not find the content useful indicated "boring" and "irrelevant content" and the illegibility of subtitles as their reasons. Of those surveyed, 58% (18 out of 31) with chronic diseases found videos on managing chronic diseases useful. Surveyees expressed interest in topics related to healthy eating, exercise, disease management, mental health and women's health.

Discussion & Conclusion:
The findings were encouraging as most of the patients noticed the video clips on HGCI. Of these, the majority found them useful and interesting. The polyclinic is potentially an effective health promotion classroom for engaging our patients. Furthermore, it can be used to educate chronic patients on the management of chronic diseases. Further action will be taken to improve the type of information and the presentation of the video subtitles on the polyclinic TV screens, based on the feedback obtained.

PCR-20

Work Motivation and Job Satisfaction amongst Doctors Working in the Polyclinic – A Mixed-Methods Pilot Study

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Background & Hypothesis:
Work motivation is a spectrum, with extrinsic motivation on one end, and intrinsic motivation on the other. Understanding work motivation and its association with job satisfaction could help increase job satisfaction amongst doctors. The aim of this study was to explore the association, as well as factors affecting work motivation and job satisfaction amongst polyclinic doctors through a mixed-methods approach.

Methods:
A survey comprising demographic information, work patterns and the Motivation at Work scale was conducted amongst doctors working in a polyclinic in Singapore. Job satisfaction was measured using a 5-point Likert scale. Three focus group discussions were subsequently carried out using information from the survey. Transcripts were recorded and analysed using a thematic analysis approach.

Results:
Fourteen doctors completed both parts of the study; 85.8% of the doctors were aged between 31 to 50 years and 71.4% had postgraduate qualifications in family medicine; 57.1% of the doctors were satisfied with their work. Doctors who were satisfied with work had higher intrinsic regulation scores on the Motivation to Work scale than those who were dissatisfied (14.6 vs 9.7, $P = 0.01$). Three themes emerged from the focus group discussions: the desire to have regular and ongoing feedback, continuity of care with a manageable workload and assignment of work based on interest, expectation and scope.

Discussion & Conclusion:
Satisfied doctors are more likely to be intrinsically motivated in their work. The themes from the focus group discussions lead to increased job satisfaction in the polyclinic. Increasing doctors' intrinsic motivation through these themes will lead to greater job satisfaction in the polyclinic.

PCR-21

Impact of a Primary Care Incentive Scheme on Accident and Emergency Attendance at a Regional Hospital in Singapore: A Pilot Study

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Background & Hypothesis:
A primary care incentive scheme was piloted in the eastern part of Singapore between a regional hospital and private general practitioners (GPs) to encourage patients with mild to moderate medical conditions not to use accident and emergency (A&E) as their first point-of-care. Patients who consulted private GPs participating in this scheme, would receive a waiver of $50 in A&E consultation fee should they be subsequently referred to the A&E. This study evaluated the impact of this scheme on A&E attendances at the regional hospital.

Methods:
This is a prepost observation study that compared the changes in annual A&E attendances at the hospital by all self-referred A&E attendees who did not arrive by ambulance and who were not personnel from the Singapore Armed Forces in the first year (2014) of the scheme relative to those of the preceding 2 years (2012 and 2013).

Results:
The annual self-referrals in 2014 was 8.7% lower than that in 2013. This decline was 2.1 and 1.5 times higher than the annual declines observed in 2012 and 2013 respectively. Among the Urban Redevelopment Authority subzones where the participating GPs were present, the annual decline in A&E annual attendances by self-referrals per resident population was 10.1% in 2014 which was 1.5 and 1.9 times higher than the annual declines observed in 2012 and 2013 respectively.

Discussion & Conclusion:
The primary care incentive scheme appeared to have contributed to a greater reduction in A&E attendances by self-referrals in the first of year of implementation relative to the preceding 2 years.

PCR-22

Unravelling Factors that Promote Relationship Building in Primary Care Teamlets

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Background & Hypothesis:
Bunniss and Kelly (2008) study of 10 primary care teams concluded that a greater understanding of team learning and capitalisation of optimal situated-learning at clinical settings was required. This research was aimed at studying teamlets in various stages of development in a primary care setting in Singapore, to understand what contributed to optimum team relationships and ultimately to effective team functioning.

Methods:
A qualitative study using focus group discussion was conducted. The rigours of qualitative study was observed through adherence to theoretical sampling, audio tape of discussion with observation, member checking, transcription adverbatim, thematic and axial coding and reflexivity with memo keeping.

Results:
The study consistently surfaced factors including importance of sufficient time, proximity of working of members within the teamlets, co-location, situational leadership, greater understanding of team members' roles and scopes and the right personalities of team members as critical for greater team relationship building.

Discussion & Conclusion:
There has been no studies to date among primary care teamlets in Singapore on the critical factors that contribute to effective relationships which lead to cohesive, high functioning teams. High functioning primary teams have been shown to improve patient care. The findings of this local study synergise with an overseas integrative study conducted by Schadewaldt, McInnes, Hiller and Gardner (2013, p. 4-5). Our study has achieved its objective of understanding some factors which constitute informal social learning, which needs to be understood and given system support, to develop future successful primary care teamlets in Singapore.

PCR-23

Evaluating the Correlation between Roland Morris Disability Questionnaire and the Bournemouth Questionnaire in Patients with Low Back Pain: A Prospective Pragmatic-Randomised Study

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Background & Hypothesis:
Low back pain is a common musculoskeletal problem in primary care associated with physical and/or psychosocial factors. Several low back pain questionnaires exist but are not generalisable to other musculoskeletal conditions. The Roland Morris Disability Questionnaire (RMDQ) is a common tool to evaluate low back pain. Of interest, the adapted Bournemouth Questionnaire (BQ) could be applied across various musculoskeletal conditions, and assesses the physical and psychosocial factors. This study investigated the relationship between the RMDQ and BQ in standardising a common musculoskeletal questionnaire.

Methods:
The study included low back pain patients who attended NHGP physiotherapy sessions from June to August 2015, with completed RMDQ and BQ. Pragmatic block randomisation was used to select 129 patients. Pearson's correlation was used to investigate the level of association between the scores of RMDQ and BQ, and the Bland-Altman plot was used to assess the level of agreement between the 2 questionnaire scores.

Results:
A total of 128 complete data were analysed and 1 set of data with error excluded. The mean (SD) age of patients was 46.5 (16.4), 52.3% of patients were male. The mean (SD) appointment lead time was 4.2 (2.7) weeks. The mean (SD) scores of BQ and RMDQ were 29.8 (16.4) and 8.7 (5.8) respectively. The BQ and RMDQ had moderate association strength, r = 0.55 (P <0.001), regardless of age or appointment lead-time adjustment. The Bland-Altman plot of BQ and RMDQ showed good agreement at 95% limit.

Discussion & Conclusion:
The adapted BQ is a valid outcome assessment for patients with low back pain, associated with good agreement against RMDQ.

PCR-24

Effectiveness of Lifestyle Weight Management Programme in Primary Healthcare

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Background & Hypothesis:
Overweight and obesity are major risk factors for the development of cardio-metabolic diseases such as diabetes mellitus, ischaemic heart disease and cerebrovascular disease. In 2015, hyperlipidaemia, hypertensive disease and diabetes mellitus add up to 41.9% of polyclinic attendances; 44% of diabetes and 23% of ischaemic heart disease can also be attributed to overweight and obesity. Hence, effective interventions are essential to manage the overweight and obesity issue to reduce the cardio-metabolic disease burden. This evaluation aims to assess the effectiveness of a primary healthcare-based lifestyle programme in helping overweight and obese adults lose weight.

Methods:
Sixty-two (53 women, 9 men) overweight and obese (27.7 ± 3.0 kg/m^2) adults (48 ± 9.6 years) completed NHGP's Weight No More Programme (WNMP). The 3-month programme consists of 6 sessions of educational lectures, small group discussions on goal setting and problem solving, 2 individual dietician consultations and group aerobic exercise. Each group is limited to no more than 15 participants to facilitate active discussion. Participants were encouraged to lose at least 5% of their baseline weight. The main outcome measure was changes in weight. Paired sample t-test was applied to the data using IBM SPSS Statistics v20.0.

Results:
After the programme, participants achieved significant ($P < 0.001$) weight loss (2.6 ± 1.9 kg), 33.9% (21 out of 62) participants lost $\geq$5% of their baseline weight.

Discussion & Conclusion:
WNMP is effective in helping overweight and obese adults to lose weight through lifestyle modification.

PCR-25

Analysis of Patient Demographics for Woodlands Polyclinic

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Background & Hypothesis:
With the rising prevalence of diabetes and obesity in Singapore, we set out to study the culture and beliefs of our patient population to better understand the effect they have on their chronic conditions.

Methods:
Data collection and analysis was performed using our patient information technology systems.

Results:
Analysis revealed Woodlands Polyclinic to have a higher proportion of Malay patients as compared to the general Singapore National Registry. A high proportion of Malay patients have chronic diseases. A high proportion of Malay patients have obesity and/or diabetes.

Discussion & Conclusion:
With an improved understanding of our patient demographics, we can focus the care we provide and target the needs of our unique patient population with a view to improving chronic care management. This can be achived through a better understanding of their needs, beliefs and health-seeking behaviours.

PCR-26

Improving Diabetes Control through a Low Carbohydrate, High Fat Diet Approach

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Background & Hypothesis:
The association between a diet high in refined carbohydrates and the development of insulin resistance, diabetes and obesity is well established. There is now an increasing body of evidence supporting the role healthy fats can play in suppressing appetite, promoting healthy ketosis (fat burning) and aiding weight loss.

Methods:
Poorly controlled diabetic patients were offered an alternative approach to diabetes control focusing on a diet low in carbohydrates and high in healthy fats and protein.

Results:
Patients, while enjoying a reduction in the number of diabetic medications they had to take, also enjoyed significant improvements in diabetic control. Some patients were able to even stop insulin injections completely.

Discussion & Conclusion:
A low carb, high fat and protein diet is often feared by the medical profession; however, it can be a useful tool in the fight against obesity and diabetes as shown by this case series study. Patients were under careful medical observation and experienced no adverse events while HbA1Cs, lipid profiles, weight and BP all improved in patients who were able to understand and successfully follow the principles of a low carbohydrate and high fat diet approach. We are now piloting a low carbohydrate diabetic clinic to observe whether the positive results may be reproducible on a larger scale.

PCR-27

Evaluation of New Family Medicine Postgraduate Training Using a Standardised Patient Satisfaction Questionnaire

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Background & Hypothesis:
With the introduction of ACGME-i Family Medicine Residency since 2011, resident continuity clinics (RCC) were introduced. Besides examinations, patient satisfaction under RCC serves as another evaluation of family medicine postgraduate training.

Methods:
This cross-sectional study comprises of an 18-item patient satisfaction questionnaire (PHQ-18) administered to patients of RCC. It comprises 18 items with 7 dimensions which measure general satisfaction, technical quality, interpersonal manner, communication, financial aspects, time spent with doctor, accessibility and convenience. These items were scored on a 5-point Likert scale. A convenience sampling of patients aged above 21 attending 7 RCCs over a 3-month period was used. Data was analysed using STRATA.

Results:
A total of 777 patients participated. The median of patient satisfaction is highest in Communication and Interpersonal subscales (median = 4.5) and lowest in Financial subscale (median = 3.5). When comparing between training years, Interpersonal subscale is significantly higher in the third year, while Time Spent and Acessibility subscales are significantly higher in the first year. There is no difference in Technical Quality, Communication and Financial subscales.

Discussion & Conclusion:
RCC showed good patient satisfaction, especially in Communication and Interpersonal subscales. Further curriculum evaluation is needed to improve technical quality. Interpersonal subscales trend suggests a training contribution. Future work will include evaluating the optimal time needed for best clinical and patient satisfaction outcomes. Financial-related satisfaction is unlikely to change without changes in health policy. Future study on scoring progression of the same resident may provide further reflection on the effect of RCC under family medicine training.

PCR-28

Improving the Uptake of Pneumococcal Vaccination in Children Aged Three to Four Months in a Primary Care Clinic

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Background & Hypothesis:
Pneumococcal disease caused by *Streptococcus pneumonia* resulted in the death of about a million children aged less than 5 years annually worldwide which is preventable with the pneumococcal vaccination (PCV 13). PCV 13 was included in the National Childhood Immunisation Programme (NCIP) in 2009 but the uptake remains low ranging from 68% to 78% in 2013 to 2014. A team was formed to improve the uptake of pneumococcal vaccination in children aged 3 to 4 months in a clinic to 95% and above within a year.

Methods:
Four root causes identified were lack of awareness of the importance and process of vaccination; incorrect message given to caregivers on NCIP; difficulty in convincing caregivers; and lack of publicity. Counter-measures tested successful were training conducted to healthcare professionals; guidance given to nurses on explaining NCIP; periodic audit on nurses to ensure correct information were given; pictorial chart given to caregivers for easy understanding; and pneumococcal vaccination poster displayed at immunisation rooms.

Results:
PCV 13 achieved an average improvement rate of 18% within a year. After 6 months of implementation, PCV 13 achieved 90% uptake rate with a gradual improvement of 1-6% over the next few months. At 9 months of implementation, PCV 13 uptake increased to 95% and sustained till date.

Discussion & Conclusion:
The counter-measures are effective in improving the uptake of PCV 13 among children aged 3 to 4 months in a primary care clinic. This could translate to better protection, prevention of diseases caused by pneumococcus and potential mortality associated with the infection.

PCR-29

Combination Therapy with Alpha-Adrenergic Blocker and 5-Alpha-Reductase Inhibitor for Lower Urinary Tract Symptoms in Benign Prostatic Hyperplasia: A Review

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Background & Hypothesis:
Benign prostatic hyperplasia (BPH) is a common condition among older men and the majority will present with lower urinary tract symptoms (LUTS). With the natural progression of disease and an ageing population in Singapore, the prevalence of BPH is expected to rise. Medical therapy that can be provided in primary care will not only improve these symptoms and quality of life, but also prevent BPH-related complications. Alpha-adrenergic blockers and 5-alpha-reductase inhibitors (5ARIs) are widely used as treatment, but are often prescribed singly as monotherapy. Prescribing them together may potentially lead to increased effectiveness. This article discusses the current evidence on combination therapy of alpha-adrenergic blockers and 5ARIs as treatment of LUTS in patients with BPH.

Methods:
A literature search in PubMed was conducted to identify original randomised controlled trials relevant to the objective of this review.

Results:
Combination therapy has been shown to be generally more effective than monotherapy of alpha-adrenergic blockers in reducing symptoms, delaying clinical progression, preventing acute urinary retention and BPH-related surgery for men with larger prostates.

Discussion & Conclusion:
Combination therapy is advantageous in the treatment of LUTS in BPH for patients with larger prostates. For the Asian population, the size cutoff is above 35 ml.

PCR-30

The Use of Manual Therapy, a Possibility for Tension Type Headache Management in Primary Care?

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Background & Hypothesis:
Tension type headache (TTH) is the commonest type of primary headache with a lifetime prevalence of 30-78% globally and 39.9% locally. In 2012, reviews for headaches contributed to 1.8% of clinic visits to National Healthcare Group Polyclinics. As TTH is believed to be related to muscular factors, treatment directed towards muscular factors such as manual therapy should be considered. This review is aimed at evaluating the use of manual therapy for TTH.

Methods:
PubMed and CENTRAL databases were searched in November 2015 with the keywords 'tension-type headache' and 'manual therapy' or 'massage' or 'physiotherapy' or 'spinal manipulation' or 'trigger point therapy'. The search was limited to randomised control trials which studied the use of manual therapy in the treatment of TTH.

Results:
Eight articles were selected for review. The studies that were included showed improvement in headache frequency, intensity and headache impact test (HIT-6) scores in favour of manual therapy but not headache duration and headache disability index (global) scores. One study also found an improvement in the number of sick leave days taken due to tension headache.

Discussion & Conclusion:
Manual therapy reduces headache frequency and intensity of attacks and reduces sick leave days resulting from TTH. There is also a positive effect on the quality of life (HIT-6). However, manual therapy does not reduce the duration of a TTH episode. Due to the heterogeneity of manual therapy technique used, it is difficult to recommend a particular regime over another. Family physicians may consider this as a possible modality of treatment.

PCR-31

A Cross-Sectional Questionnaire Study: Patients' Attitudes towards End-of-Life Care in a Singapore Public Primary Healthcare System

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Background & Hypothesis:
Death is an inevitable process of life. End-of-life care should be aligned with the patient's needs and preferences. In a local survey, 77% of the Singapore population desired home as their place of death, however only 27% of deaths occurred at home. Family physicians are in a good position to initiate end-of-life care conversations and address this discrepancy. This study aims to gain insights into the attitudes of primary care patients towards life-sustaining technology and advance directives.

Methods:
A cross-sectional, interviewer-administered questionnaire study was conducted in Ang Mo Kio Polyclinic. All patients who were aged 21 and above, conversant in English or Chinese and were not pregnant, were eligible to participate. Systematic sampling was done by approaching every 30th patient registered. The questionnaire was adapted from Blackhall et al (2009) and translated to Chinese.

Results:
A total of 339 patients were recruited with a response rate of 92.1%. The participants had an overall negative attitude towards the use of life-sustaining technology and a positive attitude towards advance directives. There were significant differences in attitude in relation to ethnicity ($P = 0.034$), marital status ($P = 0.002$) and housing type ($P <0.001$); 75.8% of patients wanted to speak to their doctors about their end-of-life care and ethnicity appeared to be a significant predictor ($P <0.001$).

Discussion & Conclusion:
The results should drive urgency for more targeted resources to be in place for initiation of end-of-life discussions in primary care. The goal would be to reduce unnecessary and extraordinary life-sustaining treatments in accordance with patient's wishes, so as to improve the quality of end-of-life care.

PCR-32

Prevalent Cardiovascular Conditions and Degree of Risk Factor Control among Prediabetes Patients Attending Polyclinics in Singapore

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Background & Hypothesis:
People with prediabetes have increased risk of cardiovascular disease and mortality. In Singapore, the National Health Survey 2010 estimated the prevalence of impaired glucose tolerance as 14.4%. This study described the prevalent cardiovascular conditions of prediabetes patients who attended primary care clinics in Singapore and their cardiovascular risk factor control.

Methods:
This is a cross-sectional analysis of prediabetes patients aged 20 years and above who visited the National Healthcare Group Polyclinics (NHGP) at least twice in 2015. Medical diagnosis, physical parameters and laboratory results were obtained from the NHG Chronic Disease Registry.

Results:
In 2015, 30,399 prediabetes patients were seen at NHGP. Men made up 50.8% and were 4 years younger than women (63.7 ± 11.1 vs 66.7 ± 10.1). Over 97% of them had at least 1 other chronic condition. Prevalent cardiovascular conditions included dyslipidaemia (88.2%), hypertension (77.8%), overweight/obesity (70%), coronary heart disease (14.3%), chronic kidney disease (11%) and stroke (8.4%). Prevalence of coronary heart disease was 2.3 times higher in men than women (19.8% vs 8.7%). Over 90% of patients had recorded blood pressure (BP) and body mass index (BMI) measurements, glucose and lipid tests; 72.8% achieved BP below 140/90 mmHg; 75.2% achieved LDL-cholesterol <3.4 mmol/L and 20.3% had ideal BMI (18.5-22.9).

Discussion & Conclusion:
Dyslipidaemia and hypertension were highly prevalent among the prediabetes patients attending polyclinics. Some had stroke, heart and kidney disease before diabetes onset. There was comprehensive risk factor monitoring of prediabetes patients. At least a quarter of prediabetes patients could further improve control of cardiovascular risk factors such as BP, LDL-cholesterol and BMI.

PCR-33

Evaluating the Preceptorship Programme at National Healthcare Group Polyclinics

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Background & Hypothesis:
The importance of preceptorship in helping students and newbies has been well delineated. The Preceptorship Programme for NHGP Nurses aimed at training sufficient competent preceptors to benefit nursing students and new nurses was developed since April 2014. The aim of this evaluation study is to determine if the programme was effective and its impact on the participants.

Methods:
This study is guided by Donald Kirkpatrick's Four-Level Training Evaluation Model that measures the effectiveness of training through 4 levels – Reaction, Learning, Behaviour and Results. Data was collected through post-training evaluations, reflective journaling, clinical logbooks and preceptorship competency checklists as part of the curriculum requirement.

Results:
Reaction: Participants' reaction to the training was captured in post-training evaluation forms. It revealed 96% of the participants agreed that the training met their learning objectives; 95% of them agreed that they had gained useful knowledge and skills (P <0.001). Learning: 100% of the participants reflected in their 321 journals that relevant knowledge, skills and attitudes were picked up through the programme. Behaviour: 3 months after the training, 70% of the participants completed logging 5 practices of precepting under supervision. Changes in participant's behaviour in precepting were seen documented in their logbook.

Discussion & Conclusion:
By going through each of these levels, we gain a better understanding of how effective the training was and its impact on the participants. Sustaining behavioural change in precepting continues to pose a challenge as it requires the preceptor's commitment to apply new knowledge and skills learned.

PCR-34

Predictor of Satisfaction with Primary Care Mental Health Care Services in Singapore

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Background & Hypothesis:
Satisfaction is an indicator of quality of care by primary care mental health (PCMH) services in polyclinics in Singapore. Satisfaction plays a significant role in strategy and tactics healthcare providers use in service delivery, offers data for accountability and funding. This pilot aimed to explore factors that contribute to patient satisfaction for the psychology services.

Methods:
Data of 350 patients of psychologists in PCMH were not normally distributed. Thus, Spearman's rank order correlation coefficient was used to analyse correlations between patient satisfaction (CSQ-8), satisfaction with care shown by psychologist, accessibility of service, pre- and post-treatment scores for depression (PHQ-9), anxiety (GAD-7) and insomnia (ISI), respectively, severity levels of symptoms, symptomatic change (i.e. difference between pre- and post-treatment scores), and presence of clinically significant symptomatic change (i.e. drop of ≥5 scores in PHQ-9, GAD-7, and/or ISI). A multiple regression was conducted to identify predictors of patient satisfaction (CSQ-8).

Results:
On total scores of CSQ-8 (mean = 28.6), 86.57% of patients reported high satisfaction (25-32), and 13.43% reported general satisfaction (17-24). The multiple regression analysis indicated satisfaction with care shown by psychologist ($\beta = 0.33$, $P = 0.00$) and predicted client satisfaction ($R^2 = 0.33$, $F_{(8, 349)} = 21.41$, $P = 0.00$).

Discussion & Conclusion:
The key variable that predicts patient satisfaction with PCMH was satisfaction with care shown by psychologists attending to patients. Consistent with international studies, this factor accounted for 33% of client satisfaction. This explains healthcare provider interactions with patients. Future study on service quality will examine qualitative data.

PCR-35

First Year Outcomes of the NHGP Patient Empanelment Care Model at Toa Payoh Polyclinic

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Background & Hypothesis:
A new care model was piloted at Toa Payoh Polyclinic (TPY); patients with chronic disease were empanelled to a teamlet of doctors, care managers and care coordinators, improving care continuity and providing team-based care. This study aims to determine the impact of the care model on clinical and preventive health outcomes, and resource utilisation, one year after implementation.

Methods:
A total of 4257 patients enrolled from 1 February 2014 to 31 August 2014 in TPY were matched with a control group of 4257 patients from Ang Mo Kio Polyclinic (AMK). Propensity score matching was conducted using demographics factors, chronic diseases, baseline HbA1C, Medifund status and hospital admissions. Clinical parameters and resource utilisation data were obtained from the NHGP database, pap smear and mammogram data from the Health Promotion Board. Data 1 year before enrolment and 1 year after were compared.

Results:
Regression analysis showed the TPY diabetic patient was more likely to meet targets for HbA1c (OR: 1.24, $P = 0.005$) and BMI (OR: 1.66, $P < 0.001$) compared with an AMK patient. Pap smear screening in eligible TPY patients significantly increased (18.0% vs 12.3%, $P = 0.001$). TPY doctor consultations (per patient per year) was less (4.1 vs 4.6, $P < 0.001$), and TPY care manager consults increased (1.3 vs 0.2, $P < 0.050$).

Discussion & Conclusion:
This pilot study of the Patient Empanelment Care Model shows improved diabetes and health screening outcomes with reduced doctor resource utilisation. Further study of the impact of the model should be done to evaluate its long-term impact on chronic disease outcomes.

PCR-36

Reviewing the Need to Screen for Urinary Tract Infection in Asymptomatic Prolonged Neonatal Jaundice in the Primary Care Setting in Singapore

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Background & Hypothesis:
NICE guidelines recommended urine culture as part of workup for prolonged neonatal jaundice. This is not a uniformed practice in the primary care setting due to practical reasons. The aim of this topic review is to look at literature over the last 10 years for rate of urinary tract infection (UTI) among well neonates with prolonged jaundice. This can give a better idea whether urine investigations are indicated as a screening step for prolonged neonatal jaundice in well babies in the primary care in Singapore.

Methods:
Literature review was done using PubMed for studies on the rate of UTI in neonates with prolonged neonatal jaundice and hyperbilirubinaemia.

Results:
Literature review showed UTI rates ranged from 0.3% to 21.1%. Urinary tract abnormalities were noted to be present in 17.4% to 100% of the neonates diagnosed with UTI.

Discussion & Conclusion:
Though there were a wide range of UTI rates, the rates appeared lower in developed countries. Other factors seemed to come into play to predict the risk for UTI. Protocols to stratify the risk will reduce unnecessary urine culture and lower cost in the workup for asymptomatic prolonged neonatal jaundice in the primary care setting in Singapore.

PCR-37

Evaluation of Advanced Wound Management Course for Registered Nurse at Primary Care Setting

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Background & Hypothesis:
Chronic wounds account for more than 50% of the wound care services at NHGP. Wound care registered nurses (RN) hold a prominent role in managing chronic wounds. Therefore, a structured Advanced Wound Management Course (AWMC) is developed for WRNs. This study aimed to evaluate the effectiveness of the AWMC.

Methods:
A 15-item self-administered pre- and post-questionnaire was administered to 7 participants for quantitative data collection. Qualitative data was obtained through 7 case reports and 1 session of focus group discussion. Wilcoxon signed-rank test was employed for quantitative data analysis while thematic text analysis was for qualitative data.

Results:
WRNs reported the increased confidence level in identifying factors affecting chronic wound healing ($Z = -2.428$, $P = 0.015$), providing holistic wound care ($Z = -2.460$, $P = 0.014$) and motivating patients to comply with treatment plans ($Z = -2.460$, $P = 0.014$). Qualitative findings corroborated the quantitative results. Three interlinked themes were identified: high level problem-solving skills, confidence in utilisation a systematic approach to perform holistic assessment, and able to develop and communicate an appropriate wound care plan to patients. Majority of the participants reported the perceived importance of multidisciplinary approach in managing chronic wounds.

Discussion & Conclusion:
This study shows AWMC could significantly improve WRNs' confidence in chronic wound management ($Z = -2.366$, $P = 0.018$). This is attributed to the enhanced knowledge and skills in holistic wound care that reflects a move from treating the "wound" to treating the person. However, the limitation lies in the small sample size. Our results pave the way for future evaluation studies with a larger sample size and higher level of application of learning.

PCR-38

Putting Feet First, Are People Doing All They Can? A Diabetic Foot Disease Review at Primary Care

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Background & Hypothesis:
Diabetic foot ulcers (DFU) are the serious complications of diabetes mellitus (DM) and a major suffering for individuals. Care of DFU accounts for approximately 50% of chronic wound care services at National Healthcare Group Polyclinics. The aim of this review was to explore the clinical characteristics of newly diagnosed DFUs.

Methods:
From April 2015 to March 2016, data including demographics, characteristics of DFU, glycosylated haemoglobin (HbA1C) from first-visit patients presenting with DFUs at Toa Payoh Polyclinic were retrospectively reviewed and analysed using descriptive statistics.

Results:
Forty-three patients (24 males and 19 females) were identified. Of which, 26 (60.5%) were Chinese and 14 (32.6%) were Indian. The median age for males was 66 years (IQR: 60.5 to 76) and for females, it was 67.5 years (IQR: 61.0 to 76.0); 53.7% of patients had DM for more than 10 years; 36.6% had history of DFU and 12.2% had previous amputation related to DFU; 61% of them did not have diabetic foot screening for more than 12 months and 34.9% had poorly controlled DM with HbA1C >8%. Most of DFUs are located on toes (53.5%) and plantar (20.9%) aspect of the foot; 10.5% of patients were referred to the emergency department due to severe wound infection.

Discussion & Conclusion:
Our review highlighted that demographic characteristics could have contributed to the development of DFUs. As this review was only conducted in one polyclinic over one year, thus a larger and longer study is required to ascertain the findings. In-depth information gained will be useful in developing a DFU risk assessment model in the future.

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