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Level of Physical Fitness among Pre-Clinical Medical Students of Universiti Kebangsaan Malaysia Medical Centre

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Background and aims: Future doctors should be equipped with agility in practicing and being a role model to the society. The present study was conducted to determine the level of physical fitness among the preclinical medical students of Universiti Kebangsaan Malaysia Medical Centre (UKMMC).

Materials and methods: A cross-sectional study was conducted among 149 preclinical medical students of year 1 and year 2 of UKMMC session 2017/2018. A self-administered International Physical Activity Questionnaire (IPAQ) was distributed to assess their level of physical activity. This was then followed by a series of physical fitness test comprising of (i) Modified Harvard Step Test (ii) Push-up and (iii) Sit and Reach Test.

Results: Among the 149 students, 49% and 51% of the students were made up of year 1 and year 2, respectively with mean age of 20.58. The level of physical activity reported by the respondents on IPAQ was 18.8% for low level, 57.7% for moderate level and 23.5% for high level. For muscular endurance test, a total of 87.0% of the respondents scored 'good', 'very good' and 'excellent' while only 12.8% in cardiorespiratory fitness and 45.6% in flexibility test achieved level of 'good' and 'excellent'. The total physical activities ($p < 0.001$: $p < 0.05$), cardiorespiratory fitness ($p < 0.001$: $p < 0.05$) and muscular endurance ($p < 0.001$: $p < 0.05$) revealed a significant difference between gender, however the flexibility test had no significant results ($p = 0.544$: $p > 0.05$). There was a weak positive correlation between total physical activity with cardiorespiratory fitness ($p = 0.037$: $p < 0.05$ with $r = 0.171$) and muscular endurance ($p = 0.004$: $p < 0.05$ with $r = 0.238$), whereas no association was observed between total physical activity with flexibility ($p = 0.88$: $p > 0.05$).

Conclusion: The physical fitness among preclinical medical students of UKMMC was moderate, hence individuals should have awareness on the importance of improving their physical fitness for the benefit of one's health.

Keywords: Cardiorespiratory fitness, exercise, physical activity

A Retrospective Evaluation of Sinonasal Fungal Infection Incidence and its Management in Universiti Kebangsaan Malaysia Medical Centre

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Background and aims: Sinonasal fungal infections are classified into invasive and non-invasive form. The aim of the present study was to evaluate the demographic and outcome of surgical treatment in patient with sinonasal fungal infection.

Materials and methods: This was a retrospective study conducted in Universiti Kebangsaan Malaysia Medical Centre (UKMMC). Patients' medical records with sinonasal fungal infection who underwent endoscopic sinus surgery (ESS) from January 1997 to December 2017 were retrieved. Their demographic data, types, culture and sensitivity, and the outcome of surgical treatment were analysed.

Results: Out of 50 patients, 46% (23) of them were males and 54% (27) were females. Based on clinical diagnosis, most of patients were Chinese 43% (22), Malays 30% (15), Indians 14% (7) and others 13% (6). Most common non-invasive fungal type were fungal ball 42% (21) and allergic fungal sinusitis 40% (20). For the invasive fungal sinusitis, acute fulminant invasive sinusitis 10% (5), chronic invasive fungal sinusitis 8% (4) and none of the them for granulomatous invasive fungal sinusitis. The most common type of culture was *Aspergillus sp.* 10% (5) followed by *Candida sp.* 4% (2). No recurrence in all patient with non-invasive fungal sinusitis. Two patients with invasive fungal sinusitis died within one-week post-surgery. The rest were treated with systemic antifungal therapy and Amphotericin B nasal irrigation for 6 months with no recurrence of disease up to date. In this study, majority of the patients showed calcification in CT scan of paranasal sinuses. All patients with fungal sinusitis underwent ESS.

Conclusion: Endoscopic sinus surgery is the goal standard of treatment in patients with fungal sinusitis. CT scan is one of the method to establish the diagnosis. All patients with invasive fungal sinusitis are recommended to be treated with a long term anti-fungal therapy.

Keywords: Computed tomography, fungi, paranasal, sinusitis

Effects of Citrus Leaf Extract on Renal Vasoactive Substance in Rats-Fed Heated Palm Oil Diet

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Background and aims: Citrus leaf extract (CLE), rich in antioxidants, was shown to reduce blood pressure. This study aimed to determine the effects of citrus leaf extract on renal vasoactive substances in rats fed with repeatedly heated palm oil diet.

Materials and methods: A total of 49 male *Sprague-Dawley* rats (200-250g) were randomly divided into 7 groups. The groups were: (i) control, (ii) fresh palm oil (FPO), (iii) FPO with CLE, (iv) five-time-heated palm oil (5HPO), (v) 5HPO+CLE, (vi) ten-time-heated palm oil (10HPO) and (vii) 10HPO+CLE. Kidneys were harvested after 16 weeks. The expressions of angiotensin-converting enzyme (ACE), angiotensin II and inducible nitric oxide synthase (iNOS) were quantified using immunohistochemistry. Haem oxygenase (HO) activity as well as nitric oxide (NO) level were determined.

Results: CLE decreased ACE, iNOS and angiotensin II expressions in rats fed with 5HPO and 10HPO diet. However, HPO and CLE had no effect on NO level and HO activity in these rats.

Conclusion: Citrus leaf extract has the potential to regulate renal vasoactive substances in rats fed heated palm oil diet.

Keywords: Angiotensin II, haem oxygenase, kidney, nitric oxide

Factors Affecting Treatment Abandonment among Childhood Malignancies Patients in Universiti Kebangsaan Malaysia Medical Centre

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Background and aims: Treatment abandonment among childhood cancer patients contributes to high mortality and treatment failure. Various demographic and treatment related factors have been reported across continents. This study explores the diverse social factors that may influence treatment abandonment in our centre.

Materials and methods: A cross-sectional study was conducted in paediatric haematology/oncology unit, Universiti Kebangsaan Malaysia Medical Centre. Newly diagnosed patients from 1st April 2016 until 31st July 2018 were identified from our unit's cancer registry. Either parents or caretaker of patient aged 0 to 18 years were interviewed and questionnaire was administered by the interviewers.

Results: There were a total of 150 cases identified from the registry, 17(11.3%) foreigners were excluded. Among 133 patients, 9(7%) abandoned their treatment; five at disease presentation and four during treatment. A total of 92(61%) respondents participated. There were 77(83.7%) Malays, 8(8.7%) Chinese and 7(7.6%) Indians. Male to female ratio was 1:5 and mean patients' age was 7.4-year-old (SD = 4.1). Majority had household income between RM2500 to RM6000 and were staying in Klang Valley. Acute lymphoblastic leukaemia with 49(46%) comprised the majority, followed by 13(12%) acute myeloid leukaemia, 10(9%) brain tumours, 5(5%) bone tumour and 15(16%) other malignancies. Among respondents, 87(94.6%) did not while 5(5.4%) abandoned the treatment. The common factors that perceived to contribute to treatment abandonment were financial issues 51(55.4%), intolerance towards side effect of treatments 43(46.7%), faith in alternative medicine 35(38%), living in rural areas 29(31.9%) and pressure due to over dependent 24(26.1%). Parents' occupation, education background, household income and health care problem among other children may predispose to treatment abandonment.

Conclusion: Treatment abandonment rate was higher in our centre compared to developed countries. Expensive medical cost, lacking awareness of the diseases and poor social support were the concern among the patients.

Keywords: Childhood onset, cancer, registry, treatment refusal

Retrospective Cross Sectional Study: Prevalence of Surgical Site Infection in Open Femur Fracture and its Association with Type of Fixation, Type of Open Fracture and Diabetic Status in Universiti Kebangsaan Malaysia Medical Centre

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Background and aims: It is a therapeutic challenge to manage open femoral fracture which occurred due to high energy trauma. Surgical site infection (SSI) is one of the most known complication. This research aimed to compare the prevalence of surgical site infection of open femoral fracture in type of fracture fixation, Gustilo-Anderson classification and diabetic status of patient in Universiti Kebangsaan Malaysia Medical Centre (UKMMC).

Materials and methods: In this retrospective cross sectional study, patients' medical records for those who underwent surgery for open femoral fracture and their follow-up from January 2010 to May 2017 in UKMMC, were reviewed. The research scope was narrowed by excluding patients with (1) less than a year follow-up, (2) pathological fracture, (3) who had implant removal only and (4) underlying immunodeficiency disorders.

Results: The preliminary study showed prevalence of SSI in open femur fracture was 31%. No significant association between Gustilo-Anderson classification ($p=0.29$), diabetic status ($p=1.00$) and type of fixation ($p= 1.00$) with SSI seen.

Conclusion: Gustilo-Anderson classification, diabetic status and type of fixation had no significant association with SSI in open femur fracture. Further study with longer duration of time frame and bigger sample size should be carried out in order to achieve better results.

Keywords: Surgical site infection, femoral fractures, glycated hemoglobin A, fracture fixation

UKMStrokIT: A Web-Based Educational Package Tool for Longer-Term Care of Stroke Patients in the Community: A Pilot Study

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Background and aims: Stroke is a debilitating chronic illness in which patients' education and rehabilitation play a major role in managing stroke patients in the community. UKMStrokIT is a newly developed web-based educational intervention aiming to improve stroke knowledge, functional improvement and quality of life among stroke patients.

Materials and methods: A pilot randomized controlled trial involving a total of 30 patients were recruited from Primer Clinic and Physiotherapy Unit of Universiti Kebangsaan Malaysia Medical Centre (UKMMC). Face and content validation were conducted among experts and carer, with verbal response given to researchers. Patients were randomized to either control or intervention group using single blinded randomization technique with a computer-generated random number. The control group received pamphlets and intervention group received three sets of videos. Pre and post assessments were done using Modified Barthel Index (MBI) questionnaire, Quality of Life Questionnaire and 25-item stroke knowledge questionnaire. Open-ended questions were included to assess participants' experiences using UKMStrokIT. Analysis was done using paired t-test for quantitative data and thematic coding analysis for qualitative responses. Intention-to-treat analysis approach was used.

Results: A total of 113 stroke patients were approached with 30 patients remained after exclusion criteria. The study is currently in the final phase of collecting data from both groups (n=15, intervention; n=15, control). The results would be presented with data tables, themes and flow-charts.

Conclusion: UKMStrokIT is shown to be helpful in long-term management of stroke patients and should be considered as an alternative to the existing management.

Keywords: Stroke, smartphone, self-management, rehabilitation, video

The Effectiveness of Stroke Window in Detecting Early Acute Ischemic Stroke

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Background and aims: The sensitivity in detection of early acute ischemic stroke can be improved by using narrower window width and window level settings on computed tomography (CT) scan of the brain. The study was conducted to determine the improvement in detection of early acute ischemic stroke by using both default brain window and stroke window settings in CT scan of the brain.

Methods and materials: All cases with a clinical presentation of acute stroke within the six-month period had been enrolled in this study. The plain brain CT finding was read using both default window and stroke window settings to detect features of early acute ischemic stroke. In cases of anterior circulation stroke, Alberta Stroke Program Early CT (ASPECT) score was calculated. All data were collected and recorded in the Proforma as per appendix. The data were subsequently analyzed using Statistical Package for Social Sciences (SPSS). Seventy-nine cases were included in this study.

Results: The detection of early acute ischemic stroke by using stroke window setting was improved among a group of students with the $p=0.000(p<0.05)$. However, there was no improvement in detection of early acute ischemic stroke among medical officer with the $p=0.080(p>0.05)$. This showed that there was a difference in the effectiveness of detecting early acute ischemic stroke using the stroke window setting between medical officers and students ($p=0.000,p<0.05$). The inter-observer agreement in diagnosis between medical officers and the gold standard was moderate with the Kappa value of 0.426 while it was fair between students and the gold standard with the Kappa value of 0.323.

Conclusion: Stroke window setting in brain CT scan is more useful for less experienced medical personnel (medical students, house officers) in detecting early acute ischemic stroke after using default window setting.

Keywords: Brain, Computed Tomography, Infarction, Stroke

The Effects of Virgin Coconut Oil on Bone Microarchitecture and Mechanical Strength in Ovariectomized Rats

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Background and aims: Virgin Coconut Oil (VCO) contains antioxidant properties, which can prevent free radicals from causing oxidative damages to the bone, thus preventing osteoporosis. Previous studies showed that VCO improves bone architecture. However, no studies were conducted on biomechanical strength. The main aim of this study was to investigate the effects of VCO on bone microarchitecture and mechanical strength in ovariectomised (Ovx) rat models.

Materials and methods: A total of 32 three-month-old Wistar rats were divided into four different groups. The groups were: (i) Control group (ii) Ovx rats with VCO (iii) Ovx rats with Oestrogen (iv) Sham operated rats. The rats were sacrificed after eight weeks of treatment and their left femurs were taken. The left femurs were scanned using micro-computed tomography (micro CT) for microarchitecture analysis. Subsequently, the femurs were tested using Instron machine for the biomechanical strength.

Results: Statistical and observational results evidenced the superiority of VCO to the other groups in terms of microarchitecture and biomechanical strength. For microarchitecture analysis, rats supplemented with VCO had a significantly greater percentage bone volume (BTV) ($p=0.016$) and trabecular thickness ($p=0.019$). However, the trabecular number ($p=0.192$) and trabecular separation ($p=0.983$) among the four groups had no significant difference. The femur of rats treated with VCO appeared to be stronger than the other groups in terms of biomechanical strength. This was evidenced by greater Young's Modulus ($p=0.013$) and stiffness ($p=0.000$) in VCO-treated rats as compared to others.

Conclusion: VCO was effective in maintaining bone microarchitecture and mechanical strength in oestrogen-deficient rat model. Therefore, VCO has the potential to be part of treatment modalities for osteoporosis.

Keywords: Postmenopausal osteoporosis, trabecular, antioxidant, biomechanics, microstructure

Caregiver Burden and Quality of Life among Carers of Patients with Parkinson Disease

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Background and aims: Parkinson disease (PD) is a chronic neurodegenerative disease associated with motor and non-motor symptoms. With progressive disability, patients require caregivers help to maintain daily functioning. This study was conducted to determine the caregiver burden in PD and its associated factors. To determine the caregiver burden and quality of life among carers of Parkinson disease patients using Zarith Burden Interview

Materials and methods: This cross sectional study was conducted among primary caregivers of patients with idiopathic PD attending the outpatient clinic in UKM Medical Centre or Malaysian Parkinson Disease Association (MPDA) community centre. Caregiver burden was determined using the Zarith Burden Interview and caregivers' quality of life was assessed using the Adult Carer Quality of Life Questionnaire (AC-QoL). The staging of PD was determined using the modified Hoehn and Yahr scale.

Results: A total of fifty-one caregiver-patient pairs completed the study. Of these, 13 were recruited from the outpatient clinic, while 38 were recruited from MPDA community centre. There were 9 Malays, 37 Chinese, 4 Indians and 1 from other ethnic. The mean age of caregivers and patients were 57.04 years (SD=12.794) and 71.12 (SD=7.030) years respectively. The mean PD duration was 10.76 (SD=8.127) years. Mean PD stage was 3.62 (SD=1.232). The mean Zarith caregiver burden score was 27.39 (SD=14.069). 40 (78.4%) patients had mild burden, 11 (21.6%) had moderate burden while none had severe burden. The mean quality of life score was 76.71 (SD=19.161). Most (n=48, 98%) caregivers had normal to high quality of life scores. High caregiver burden correlated significantly with poorer quality of life ($p=0.003$, $r=0.591$). Comparison between high and low burden showed that three non-motor symptoms contributed significantly to higher caregiver burden; personality changes ($p=0.039$), psychosis ($p=0.037$) and sexual concern ($p=0.003$). Patients with age 70 years and above contributed significantly to higher caregiver burden ($p=0.041$). Age of caregivers ($p=0.519$), duration of disease ($p=0.543$), stage of disease ($p=0.262$) were not significantly associated with high burden.

Conclusion: .The caregivers in this study reported low to moderate burden with

good quality of life scores. Factors associated with high burden were the presence of psychosis, personality changes, sexual concern and higher patient age (70). The low caregiver burden in this study is possibly due to relatively short disease duration and active involvement in the Parkinson community centre.

Keywords: Parkinson disease, caregiver, burden, Zarith Burden Interview, Quality of Life

Knowledge and Attitude of Employed Mothers Towards Breast Milk Expression, Storage and Usage

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Background and aims: Appropriate knowledge on expressing, storing and use of breast milk as well as positive attitude are essential to continuation of breastfeeding when mothers return to work. The aim of the study was to assess the knowledge and attitude of employed mothers towards breast milk expression, storage and usage.

Materials and methods: This cross-sectional study was conducted among employed mothers who delivered at a tertiary hospital in Kuala Lumpur, Malaysia. A content-validated questionnaire consisting of 28 questions to test knowledge and 9 questions to assess attitude was used. The highest possible scores for knowledge and attitude were 28 and 45, respectively.

Results: We recruited 300 mothers in the study. The mean score for knowledge was 20.54 (SD 4.16). Mothers who scored ≥ 21 ($\geq 75\%$ of maximum score) were categorized as having “good knowledge” whilst those who scored <21 were considered to have “poor knowledge”. 174(58%) mothers had good knowledge. Good knowledge was significantly associated with Malay ethnicity, older age, tertiary education, parity status, prior breastfeeding experience and prior information on breast milk expression. A total of 219 (73%) mothers had positive attitude (scored ≥ 34). Malay ethnicity, tertiary education, parity status, prior experience giving expressed milk and feasibility of expressing breast milk at workplace were significantly associated with positive attitude.

Conclusion: More than half of the mothers had good knowledge whilst majority had positive attitude towards breast milk expression, storage and usage. Having knowledge and good attitude is the first step towards promoting practice of breast milk expression, thus encourages exclusive breast feeding among employed mothers.

Keywords: Breast milk, knowledge, attitude, employed, mothers

Usage of Safety Engineered Device among House Officers in Universiti Kebangsaan Malaysia Medical Centre and Its Associated Factors

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Background and aims: Needle stick injuries (NSI) are the most prevalent injuries among healthcare workers which can result in transmission of blood-borne pathogens such as Hep B, Hep C and HIV. This study was conducted to assess the usage of safety engineered device among house officers in Universiti Kebangsaan Malaysia Medical Centre (UKMMC) and its associated factors.

Materials and methods: This was a cross-sectional study conducted among House Officers (HO) in UKMMC. Data was collected using validated self-administered questionnaire via simple random sampling to assess the sociodemographic and factors associated with the use of SED. All data were analysed by using Statistical Package for the Social Sciences (SPSS) version 20.0.

Results: A total of 158 HO had participated. Sociodemographic factors did not show significant association with usage of SED. In general, female Malay HO who worked in the Internal Medicine department had the highest risk of getting needle-stick injury. The commonest device involved in needle-stick injury was hypodermic needle (62.0%). 91.8% of HO used SED in their practice which is significantly influenced by mandatory policy (p -value=0.005). However, the usage of SED did not significantly reduce incidence of NSI (p -value: 0.975). The HO agreed with the predisposing factors, enabling factors and reinforcing factors with total scores of 39.5633/50, 13.0000/20 and 11.5886/15 respectively. HO who received training for past 12 months had significantly lower risk of NSI (p -value: 0.005).

Conclusion: The factors above influences usage of SED among HO. However, training should also be provided to effectively reduce incidence of NSI.

Keywords: Safety Engineered Device, House Officer, Needle stick injury

Effects of Traditional and Convenient Edible Bird's Nest on Spatial Learning of Male Sprague-Dawley Rats

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Background and aims: Consumption of edible bird nest (EBN) has been a practice for the health benefits it is believed to provide. This study was done to investigate the effects of both traditional edible bird nest (TEBN) and convenient edible bird nest (CEBN) on spatial learning of male Sprague Dawley rats.

Materials and methods: A total of 24 male rats (270-300g) were divided into three groups based on diet given: (i) pellet only, (ii) pellet mixed with TEBN (300mg/kg) and (iii) pellet mixed with CEBN (300mg/kg). The rats were fed for 30 days with the aforementioned diet and exposed to 8 arm-radial maze for their spatial learning assessment, which consists of 3 phases: (i) Shaping (3 days), (ii) acquisition (8 days), and (iii) retention trials.

Results: Control group showed better overall performance with both edible bird nest groups showing better reference memory. There was no significant difference in retention of memory across the groups.

Conclusion: Both traditional and conventional edible bird nest showed no effect on spatial memory, however, both groups of edible bird nest was able to show better reference memory.

Keywords: spatial memory, supplement, cognition

In Silico Docking of Vitamin E Isomers on Transport Proteins

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Background and aims: Vitamin E is comprised of tocopherol (T) and tocotrienol (T3) which are further divided into four isomers each: α , β , γ and δ . Vitamin E is known to have neuroprotective, antioxidant, anti-cancer and cholesterol lowering effects. To date, the transport of these isomers remains unknown, except for α T. This study aimed to determine the binding of vitamin E isomers on transport proteins using *in-silico* docking.

Materials and methods: Transport proteins were selected using AmiGo Gene Ontology tool based on similar molecular function annotation to α -tocopherol transfer protein (α -TTP): vitamin E binding or intermembrane lipid transfer activity. The protein structures were obtained from Protein Data Bank. The ligands structures were obtained from ZINC database. *In-silico* docking was performed using SwissDock.

Results: A total of 6 transport proteins were found in the search: SEC14-like protein 2, glycolipid transfer protein (GLTP), Pleckstrin homology domain-containing family A member 8, collagen type IV alpha-3-binding protein, ceramide-1-phosphate transfer protein and afamin. Compared with other transport proteins, α TTP had the highest affinities (-11.26 kcal/mol to -10.63 kcal/mol) for all isomers except β T3. The binding order of vitamin E isomers towards TTP was γ T > β T > α T > δ T > α T3 > γ T3 > δ T3 > β T3. GLTP had higher affinity for tocotrienols than tocopherols. β T3 bound stronger to GLTP (-10.51 kcal/mol) than α TTP (-10.43 kcal/mol).

Conclusion: α TTP remains as the most preferred transport protein for most of the vitamin E isomers. α T, being the most bioavailable isomer, yet not the one with the highest affinity toward α TTP suggesting that other proteins may involve in the bioavailability and transport of this isomer. GLTP may play a role in transporting tocotrienols, especially β T3. Further studies are required to understand the transport of vitamin E in the body. Improving the bioavailability of these isomers may enhance their beneficial effects to human.

Keywords: Molecular docking, tocopherol, tocotrienol, transport protein

Snakebite and Related Injuries in Malaysia Consulted to Remote Evenomation Consultancy Services from 2015 to 2017

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Background and aims: Snakebite is a common medical emergency in Malaysia, however verified epidemiological data is limited. This study aimed to analyse the snake-related cases in Malaysia consulted to Remote Evenomation Consultation Services (RECS) from 2015 to 2017.

Materials and methods: This was a retrospective study, where all RECS cases from 2015 to 2017 were collected. Data was then analysed with Statistical Package for the Social Sciences version 25.0.

Results: There were a total of 1,820 cases whereby, 1,548 (85.1%) were snake-related and 272 (14.9%) were non-snake related. Snake-related cases includes 1,513 (97.7%) snakebites and 35 (2.3%) venom ophthalmia. For snakebite injuries, 829 (54.8%) were unidentified and 684 (45.2%) were identified. The commonest identified snake species was *Naja sumatrana* (119, 16.6%), followed by *Naja kaouthia* (59, 8.2%) and *Tropidolaemus subannulatus* (58, 8.1%). The majority of patients were Malaysians (85.2%), males (74.8%) and adults (83.6%). The mean age was 34.21 years (SD: 18.8). Lower limb (53.9%) was the commonest affected area. Localized pain (83.8%) and swelling (48.7%) were the commonest clinical symptom and sign respectively. Tourniquet was the commonest prehospital intervention (74.9%). Antivenom was administered in 340 (22.0%) patients and 32 (9.4%) developed hypersensitivity reaction. There were two recorded deaths related to complications from snakebite. The majority of patients arrived within 2 hours post incident. The length of stay for most hospitalized patients was 1 to 3 days (73.7%).

Conclusion: Awareness of appropriate first aid and optimal clinical management are crucial in reducing morbidity and mortality from snakebites. Training and public outreach programmes are very important to increase awareness, knowledge and confidence level.

Keywords: Emergencies, Malaysia, snake bites, venoms

Clinico-Epidemiological Characteristics of Melioidosis in Universiti Kebangsaan Malaysia Medical Centre

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Background and aims: Melioidosis is an infection caused by *Burkholderia pseudomallei*, an environmental gram-negative bacterium. It occurs predominantly in Southeast Asia and Northern Australia. This endemic disease is life-threatening and has the potential to evolve into an epidemic outbreak. This study aimed to depict the clinical and epidemiological characteristics of melioidosis in a tertiary care centre in Kuala Lumpur.

Materials and methods: This was an 8-years retrospective review of melioidosis cases in Universiti Kebangsaan Malaysia Medical Centre from the period between January 2010 and December 2017. There were 39 culture-proven melioidosis cases but only 37 medical records could be retrieved and analysed.

Results: Out of 37 patients, 30 (81.1%) were males. Twenty-eight individuals (75.6%) were within 40-69 age group. The most common underlying disease was diabetes mellitus (78.4%). There were 2 cases of recurrent melioidosis. Most patients (86.5%) had bacteraemia. The most common clinical presentation was pneumonia (51.4%), followed by splenic abscess (18.9%) and soft tissue abscess (16.2%). Twenty-two patients (59.5%) received Intensive Care Unit management and 5 of them died. In total, 7 patients died (18.9%) and the remaining 2 patients died within 24 hours of admission. Most isolates were sensitive towards ceftazidime (94.6%), followed by co-trimoxazole (89.2%) and amoxicillin-clavulanate (81.8%).

Conclusion: Acute melioidosis has high mortality rate, thus a high index of suspicion is important especially in patients with underlying diabetes mellitus. Further study is needed to better depict the clinical profile of this life-threatening infection besides observing the diseases trend.

Keywords: *Burkholderia pseudomallei*, ceftazidime, diabetes mellitus, melioidosis, pneumonia

The Effect of Type, Duration and Intensity of Exercise on Inflammatory Markers C-Reactive Protein, Interleukin-6 and Interleukin-18 in Metabolic Syndrome Patients: A Systematic Review

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Background and aims: Metabolic syndrome (MetS) have become a major clinical challenge worldwide due to rise in urbanisation, surplus energy intake, increase in obesity and sedentary lifestyle. C-reactive protein (CRP), interleukin-6 (IL-6) and interleukin-18 (IL-18) are proven to be associated with MetS. Physical activity is advised for individuals detected with MetS. Hence, systematic review was performed to investigate the effect of exercise on inflammatory markers in MetS patients and aimed to know the best exercise regime suitable for them.

Materials and methods: The studies were selected based on literature search confined to PubMed, Scopus, EBSCO and Ovid databases. The searches were standardized by using the same search strategy which included the terms such as “metabolic syndrome”, “CRP”, “IL-6”, “IL-18” and “exercise”. Only clinical human studies published from January 2007 until May 2018 were included.

Results: A total of 11 clinical trials (466 participants) were selected. Majority of the studies were randomized controlled study design (90.9%). All studies showed a decrease in the serum level of the biomarkers stated. However, not all were statistically significant. The main type of exercise performed in majority of the studies was the aerobic exercise. Aerobic-resistance exercise was shown to be more effective rather than aerobic alone, but, aerobic exercise was the only one effective as a sole intervention. The efficacy in different intensity and duration of the exercise was unable to compare as only a limited range was used in the studies.

Conclusion: Aerobic exercise showed promising role as the main lifestyle intervention in MetS. It is concluded that combined aerobic-resistance exercise is the best recommended for MetS.

Keywords: Physical activity, inflammation, insulin resistance, obesity

An Observational Study on Duration of Preoperative Fasting Duration for Paediatric Surgical Patients

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Background and aims: Preoperative fasting is important to prevent pulmonary aspiration. Fasting guidelines have been developed in order to reduce that risk. Children are often fasted longer than the recommended duration by the current fasting guidelines. This study aimed to observe the duration of preoperative fasting time in paediatric patients and factors that contribute to non-compliance, as well as to assess the ward staffs and doctors' knowledge regarding the current fasting guidelines.

Materials and methods: Sixty paediatric patients were recruited for this cross-sectional study using convenience sampling method. The operation list was obtained the day before the operation. Information regarding fasting time, underlying discrepancies between instruction given by doctors and nurses will be recorded. Post-operatively, data on the sequence of operation lists were reviewed and any changes were recorded. Ward staff including nurses, surgical doctors and anaesthetic doctors were also assessed on their knowledge about current pre-operative fasting guidelines. Data were analysed using statistical analysis SPSS 20 Software.

Results: Sixty paediatric patients were preoperatively fasted for mean duration of 10.252 hours for solid or formula milk; 4.813 hours for breast milk and 5.082 hours for clear fluid respectively. Meanwhile, majority of our staff nurses and doctors had good knowledge regarding the current paediatric preoperative fasting guidelines.

Conclusion: Continuous education and or activities should be implemented on a regular basis to ensure staffs' knowledge on current guidelines are updated. This is to ensure the correct information can be conveyed to the guardians to prevent prolonged fasting in paediatric patients.

Keywords: Preoperative, fasting, children, guidelines

Endometrial Pathology in Abnormal Uterine Bleeding: A Clinicopathological Study

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Background and aims: Abnormal uterine bleeding (AUB) is a common and challenging problem encountered by the gynaecologist. The aim of this study was to identify the endometrial pathology in AUB and their distribution within different age group and parity.

Materials and method: This was a cross-sectional study done at Universiti Kebangsaan Malaysia Medical Centre on 313 patients that presented with abnormal uterine bleeding and had undergone endometrial sampling from January 2017 to June 2018. The patients' age, parity, final histopathological diagnosis and history of tamoxifen therapy were recorded for further statistical analysis.

Results: The most common diagnosis was proliferative endometrium (40.7%) and followed by secretory endometrium (19.9%). Whereas, the hyperplasia and neoplastic causes were among the less frequently encountered: endometrial hyperplasia without atypia (6.4%), hyperplasia with atypia (2.2%) and endometrial carcinoma (6.1%). The most common age group presented with AUB was 41-50 years (42.9%). Within the different parity group, multiparous women (54.2%) were the highest group presented with AUB.

Conclusion: Endometrial assessment in AUB is crucial in the understanding of AUB and its causes. Proliferative endometrium was the most common among endometrial pathology in AUB. Incidence of AUB peaked in women in 40-50 years old. Women aged 50 and above is significantly associated with endometrial carcinoma and hyperplasia with atypia.

Keywords: Age, parity, tamoxifen, endometrial carcinoma, endometrial hyperplasia.

Research Competency among Academicians and Its Associated Factors in Faculty of Medicine, Universiti Kebangsaan Malaysia Medical Centre – A Preliminary Analysis

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Background and aims: Research competency among academicians plays a very crucial role in order to produce good and beneficial research. This study is aimed to determine the research competency among academicians and its associated factors in Faculty of Medicine, Universiti Kebangsaan Malaysia Medical Centre (UKMMC). The factors associated are knowledge and intellectual abilities, personal effectiveness, research governance and organization and engagement, influence and impact.

Materials and methods: This was a cross-sectional study using universal sampling technique involving 306 academicians from 21 departments in the Faculty of Medicine, UKMMC. A self-administered standardised five-point Likert scale question was used (validated with a Cronbach's Alpha value of 0.847) in this study.

Results: A total of 171 respondents participated in this study in which 17.5% are professor, 22.2% are associate professor. 27.5% are senior lecturer, 22.2% are lecturer and 10.5% are training lecturer. The most important domain that impede the research competency in UKMMC is research governance and organization (63.45%) followed by knowledge and intellectual abilities (65.29%) and personal effectiveness (68.29%). Academic qualification and academic rank is significantly associated with all domains ($p < 0.05$). However, after controlling other variables, academic rank is the only factor that is significantly significant ($p < 0.05$).

Conclusion: Research competency among academicians can be improved by enhancing research governance and organization. Academic rank is the most important factor in research competency.

Keywords: effectiveness, impact, knowledge, governance

Attitude Towards Suicide and Helping Seeking Behaviour among Medical Undergraduate in Universiti Kebangsaan Malaysia Medical Centre

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Background and aims: The attitude of health personnel towards suicide may influence the outcome of suicidal patient management. Nevertheless, the attitude of medical students towards suicide and their help seeking behaviour has not been well studied. This study aimed to determine medical undergraduates' attitudes towards suicide and its association with their help seeking behaviour.

Materials and methods: A cross-sectional study was conducted in Universiti Kebangsaan Malaysia Medical Centre from July to September 2018 and 286 medical undergraduates from pre-clinical to clinical years were enrolled. Attitude Towards Suicide and General Help Seeking questionnaires were used as instruments.

Results: The mean age of participants was 22.4 years. Most participants were single (98.9%). Of the participants, 6.2% were previously diagnosed with psychiatric illness; 7.9% have family history of psychiatric illness and 15.2% of medical undergraduates had attended a suicide prevention program. Participants were most agreeable on the domain of ability to help suicidal patients, with an average score of 3.84 ± 0.75 and least able to understand and accept suicide, with an average score of 1.85 ± 0.72 . Those who had undergone psychiatry posting were more agreeable to suicide as a way of communication ($p=0.008$). Participants previously diagnosed with psychiatric illness were more able to understand and accept suicide ($p<0.001$) and agreeable to the normality of suicide ($p=0.019$). Those who had attended a suicide prevention program were more inclined to agree loneliness and avoidance could be triggers to suicide ($p=0.037$). Participants preferred to seek informal help than formal help when in distress or suicidal with average scores of 4.39 and 3.33, respectively. There was no correlation between attitude towards suicide and general help seeking behaviour.

Conclusion: Education programmes regarding suicide need to be taught to all medical undergraduates early to cultivate a more positive attitude towards suicide and appropriate help seeking behaviour.

Keywords: Suicide, attitudes, help-seeking behaviour

The Knowledge, Attitude and Practice of Organ Donation among Healthcare Workers in Universiti Kebangsaan Malaysia Medical Centre

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Background and aims: The demand for organ donation is increasing day by day in Malaysia. Healthcare personnel have crucial role in educating potential donors. This study is aimed to determine the level of knowledge, attitude and practice (KAP) regarding organ donation and associated factors amongst healthcare workers in UKMMC.

Materials and methods: A cross sectional study was conducted among 255 healthcare workers of UKMMC. Subjects were divided into three groups which were doctors, nurses and health assistants. There were 85 participants from each group. A validated 39-item contain self-administered questionnaire were used to assess the level of knowledge, attitude and practice regarding organ donation among the participants.

Results: The mean score is highest among doctors compared to nurses and health assistants respectively in terms of knowledge ($121.74(84.0\%) \pm 12.19$; $115.32(79.5\%) \pm 14.16$; $109.71(75.7\%) \pm 13.63$, $p < 0.001$), attitudes ($50.27 (83.8\%) \pm 5.70$; $43.00(71.7\%) \pm 6.88$; $42.34(70.6\%) \pm 6.85$, $p < 0.001$) and practice ($6.33(63.3\%) \pm 1.75$; $4.33(43.3\%) \pm 2.19$; $3.33(33.3\%) \pm 2.31$, $p < 0.001$). Further analysis showed the attitude and practice toward organ donation were significantly higher among doctors ($p=0.001$), tertiary education ($p=0.001$), male ($p=0.001$), Indian ethnicity ($p=0.001$), Hindus ($p=0.001$) and high monthly income ($>RM10000$) ($p=0.001$). However, the knowledge was significantly associated with younger age (21-30) ($p=0.026$), Chinese ($p=0.034$) and moderate monthly income (RM5000-10000) ($p=0.001$). The factors affect attitude and practice is not associated with knowledge.

Conclusion: An organ donation campaign should be conducted to increase attitude and practice among those who has knowledge but not willing to practice.

Keywords: knowledge, attitude, practice, doctor, nurse.

Social Anxiety and Smartphone Addiction among Medical Students: Are They Linked?

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Background and aims: Social anxiety is defined as the fear of being scrutinized in a social or performance situation; a disabling condition that impairs one's quality of life (QoL) and social relationship. Conversely, smartphone use has permeated today's lives as a social medium. This study investigated whether social anxiety was linked to smart media's problematic use; while considering the interplay of other psychosocial factors; for social anxiety; among medical students of a public university.

Materials and methods: A cross sectional study was conducted on 423 medical students. They were selected via consecutive sampling which include year one, four and fifth. Whereby self-administered including Social Interaction Anxiety Scale (SIAS), World Health Organization Quality-of-Life Scale (WHOQOL-BREF), Rosenberg Self-Esteem Scale, Smartphone Addiction Scale-Short Version, and Relationships Questionnaire were used.

Results: The rate of social anxiety among the medical students was found to be 19%. Multiple regression showed that social anxiety was significantly positive correlated with internet addiction ($r= 0.267$, $\beta= -0.387$, $p<0.001$), and self-esteem ($r = 0.488$, $\beta= +0.161$, $p<0.001$). No significant association was found between social anxiety and sociodemographic, quality of life and attachment style.

Conclusion: Almost one fifth of students had some degree of social anxiety. This study also found that social anxiety was correlated to problematic use of smartphone and low self-esteem. Identification of "at risk" group is important to be incorporated in the prevention and intervention of social anxiety.

Keywords: Social anxiety, self-esteem, internet addiction, quality of life, medical students

Take Your Meds: A Prototype Medication Reminder Mobile Phone Application

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Background and aims: In this technological era, majority of people have their own smartphones which can be used to their advantage if they are on prescribed medication. Most of medication non-compliance cases were due to forgetfulness. Thus, developing a prototype medication reminder application (app) to encourage patients to take their medications at specific time can be beneficial and may improve their compliance in the long term.

Materials and Methods: TAKE YOUR MEDS is a prototype medication reminder mobile phone app was developed by Universiti Kebangsaan Malaysia (UKM) investigators from the beginning. Improvements of the app were done after conducting alpha testing in 10 medical students. The final version of the app was tested in 18 patients with primary open angle glaucoma (POAG) (beta testing). Subjects downloaded the app and filled in an evaluation form pertaining to the prototype app after testing it for two weeks. Digital images of patient taking medication were sent to the investigators as evidence of compliance.

Results: The final version of the prototype app was completed within 7 months. Alpha testing fixed bugs and improved security. Beta testing showed the prototype app was user friendly and functional. Majority of subjects were quite satisfied with the app and likely to recommend it to others.

Conclusion: The new UKM prototype medication reminder app is a useful tool for monitoring and reminding patients to take their medications and may improve compliance among patients.

Keywords: glaucoma, mobile application, reminder, apps

Comparative Analysis Study of Growth Pattern and Dedifferentiation of Human Chondrocytes Cultured with Platelet Lysate and Foetal Bovine Serum

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Background and aims: Traditionally, foetal bovine serum (FBS) had been used as serum supplement for stem cell expansion in tissue engineering settings. However, this supplement is associated with xenoimmunisation and transmission of animal pathogens which may cause harm to the stem cell recipients. As a safer alternative, human platelet lysate (HPL) has been used for the propagation of stem cells. Chondrocytes have been expanded *in vitro* for cartilage repair via autologous chondrocyte implantation (ACI). In this study, we compared the efficacy between HPL and FBS in promoting the growth and maintaining the chondrogenic markers of human primary chondrocytes expanded *in vitro*.

Materials and methods: Chondrocytes were isolated from 6 donors underwent total knee replacement in Universiti Kebangsaan Malaysia Medical Centre. The cells were cultured in F12:DMEM medium supplemented with 5% HPL, 10% HPL and 10% FBS. The cell morphology, viability and growth rate were examined from passage 1 to passage 3. RNA was isolated from passage 3 cells for quantitative polymerase chain reaction to determine the gene expression of chondrogenic, dedifferentiation and hypertrophy markers.

Results: HPL promoted chondrocyte proliferation without compromising the cell viability. Based on the morphology of the chondrocytes observed from the photographs, we noticed that chondrocytes cultured with HPL were smaller in size. In addition, HPL helped the chondrocytes to retain its' chondrogenic markers.

Conclusion: Our study has demonstrated the benefits of HPL supplementation in human chondrocyte culture. In future, HPL can be used for the large-scale expansion of chondrocytes for ACI.

Keywords: Tissue engineering, human platelet lysate, chondrocytes, growth factors, cartilage

Prevalence of Multidrug Resistant *Pseudomonas aeruginosa* Bacteraemia Cases and Its Associated Risk Factors in Universiti Kebangsaan Malaysia Medical Centre

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Background and aims: Cases of multidrug resistant (MDR) *Pseudomonas aeruginosa* is on the rise over the years. The infection is difficult to treat due to limited choices of antibiotics hence impacting the rate of morbidity and mortality. This study was conducted to determine the prevalence and risk factors of MDR *Pseudomonas aeruginosa* bacteraemia in Universiti Kebangsaan Malaysia Medical Centre (UKMMC).

Materials and Methods: In this cross-sectional study, 283 patients with positive blood culture for *Pseudomonas aeruginosa* from January 2013 until December 2017 were identified. A total of 190 patients were included in data analysis. The remaining were not analysed due to delay in obtaining full medical records. Demographic data were retrieved from patients' medical record. The risk factors identified were use of central venous catheter, urinary catheter, nasogastric tube, day of hospitalisation, intensive care unit admission, steroid and previous antibiotic therapy. Data for antibiotic susceptibility testing were collected from Microbiology laboratory database.

Results: Out of 283 bacteraemia, 16 MDR *Pseudomonas aeruginosa* cases were isolated. Hence, the prevalence of MDR *Pseudomonas aeruginosa* in UKMMC was 5.7%. Pattern of antibiotic susceptibility testing in all samples positive for *Pseudomonas aeruginosa* showed the highest resistance towards imipenem which was 41 (14.6%). A significant association between MDR *Pseudomonas aeruginosa* and previous antibiotic therapy with penicillins group antibiotic was seen ($p = 0.005$). There was no association with other risk factors.

Conclusion: Prevalence of MDR *Pseudomonas aeruginosa* bacteraemia cases was 5.7% in UKMMC. Previous antibiotic therapy with penicillins group was identified

as the only risk factor of MDR *Pseudomonas aeruginosa* bacteraemia. Further study with bigger sample size and longer duration should be explored to enhance the practice in prevention and management of MDR *Pseudomonas aeruginosa* bacteraemia.

Keywords: antibiotic resistance, bacteraemia, *Pseudomonas aeruginosa*

A Study of HER2 Protein Overexpression by Immunohistochemistry in Breast Cancer and Its Association with HER2 Gene Status: A Single Institutional Experience

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Background and aims: Evaluation of HER2 status in breast cancer is important to establish prognosis and to select patient for targeted therapy. HER2 immunohistochemistry (IHC) study is routinely performed in all major hospitals in Malaysia. However, confirmation of HER2 gene amplification by in-situ-hybridization (ISH) study which is done on IHC positive (score 3+) and equivocal cases (score 2+) is costly and not widely available. The aim was to determine the accuracy of HER2 IHC score specifically in score 2+ and 3+ by verifying the association with its gene status by dual-colour dual-hapten in-situ hybridization (DDISH) study.

Materials and methods: Retrospective study was done on referred 767 breast cancer cases over a period of five years. The HER2 IHC score (the initial and repeat test) and DDISH gene amplification results were retrieved from histopathological reports. Association between HER2 IHC score and its gene status by DDISH was analysed. Concordance of HER2 IHC score between referring and referral hospitals were calculated and their agreement was established.

Results: There was significant association between HER2 IHC score and its gene status by DDISH ($p < 0.001$). Only 56 out of 207 cases (27.1%) with 2+ IHC score showed HER2 gene amplification by DDISH while 446 out of 451 (98.9%) cases with 3+ IHC score were amplified. There was moderate agreement of HER2 IHC score between referring and referral hospitals (Kappa co-efficient 0.526, $p < 0.001$). The concordance of HER2 IHC score between referring and referral hospitals of score 2+ was 52.7% while score 3+ was 89.4%.

Conclusion: Recommendation was made to do DDISH study in all IHC equivocal cases (2+) and may not be performed in positive IHC cases (3+) due to high cost of DDISH study.

Keywords: breast cancer, HER2 gene, HER2 immunohistochemistry, DDISH

Nutrition in Autism Spectrum Disorder: Level of Awareness and Knowledge among Parents and Educators in Malaysia

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Background and aims: Macronutrients and micronutrients are essential for child growth. However, children with autism spectrum disorder (ASD) are picky eater, which may lead to malnourishment, due to limited and restricted diet. Realising how their diet and behaviour importantly interconnect with each other, we aim to see the level of awareness and knowledge among parents and educators of children with ASD regarding their diet.

Materials and methods: In this cross-sectional study, a total of 226 questionnaires were distributed during training of trainers' sessions at Pusat Permata Kurnia and only 209 were analysed. This is inclusive of 153 parents (73.2%) and 56 educators (26.8%) of children with ASD. The data was then collected and analysed descriptively.

Results: The statistical results showed that parents shown a low level of awareness and knowledge as only 37.9% agreed their children's diet contain balanced nutrition. Majority of the parents agreed that complex carbohydrate (75.8%), junk food (85.0%) and gluten (42.5%) are bad for their children but they still provide them anyway. In addition, whilst more than 60.0% respondents are not aware of the Malaysian Dietary Guideline, 94.3% admitted that they look forward to a proper nutritional guideline for their ASD children and are willing to abide.

Conclusion: The low level of awareness and knowledge among parents and educators about the nutrition of children with ASD indicates that a measure should be taken to increase the awareness and to overcome the malnutrition among ASD children.

Keywords: gluten, casein, diet, supplement, malnutrition

Comparison of the Degree of Improvement in Correct Electrocardiogram Interpretation between Workshop-Based and Self-Directed Learning among Year Four Universiti Kebangsaan Malaysia Medical Centre Medical Students

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Background and aims: Recognition of ST-Elevation myocardial infarction requires electrocardiogram (ECG) to be interpreted quickly and correctly. Currently, undergraduate medical students of Universiti Kebangsaan Malaysia Medical Centre acquire interpretation skills in various ways during clinical postings. This study evaluated the effectiveness of ECG learning between Workshop-Based Learning (WBL) and Self-Directed Learning (SDL) methods.

Material and methods: A prospective randomised controlled experimental study was conducted in September 2018 whereby 69 Year Four undergraduate medical students were randomly assigned to either WBL (n=35) or SDL (n=34). WBL subjects received coaching, correction and explanation from an instructor whereas SDL subjects read materials and discussed among themselves. Pre- and post-tests were performed shortly before and after each intervention, utilising different sets of 10 ECGs that were validated by two experts; a cardiologist and an emergency physician.

Results: There was a significant increase in the median of total marks of post-intervention test, 2.500 (IQR 2.125) as compared to pre-intervention test, 1.500 (IQR 1.625) for SDL ($p = 0.048$). A significant increase in the median of total marks of post-intervention test, 2.500 (IQR 2.500) was observed as compared to pre-intervention test, 1.000 (IQR 2.000) for WBL method ($p = 0.002$). However, the difference is not statistically significant, with SDL mean score of 0.500 ± 1.398 and WBL 0.929 ± 1.609 ($p=0.242$). Analysis of interpretation between STEMI and STEMI-mimics ECGs showed that the WBL group has performed better than the SDL group in recognizing STEMI mimics ($p=0.001$). Overall interpretation performance including both STEMI and STEMI-mimics do not differ between the two groups. We attribute this to several factors: utilization of obvious STEMI ECGs, suboptimal duration for an effective workshop and students' pre-condition that are well adapted to passive

learning style such as lecture and self-study.

Conclusion: We recommended that workshop-based ECG learning to be incorporated in the medical curriculum in order to enhance ECG interpretation skills at recognizing STEMI mimics.

Keywords: Electrocardiography, learning, self-directed, ST-Elevation myocardial infarction

Correlation Between Internal Iliac Artery Stenosis with Symptoms of Erectile Dysfunction

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Background and aims: Erectile dysfunction was once considered to be psychogenic in origin and was frequently neglected by health care providers. The main aim of the study was to correlate the status of internal iliac artery patency with erectile dysfunction.

Materials and methods: A total of 105 male patients who underwent CT Angiography (CTA) of lower limb in Universiti Kebangsaan Malaysia Medical Centre (UKMMC) from year 2015 to 2018 were selected. Their CTA were reviewed to determine the patency of internal iliac artery that further classified as patent, mild, moderate and severe stenosis. The method used was by calling the patients to ask questions regarding symptoms of erectile dysfunction.

Results: Out of 105 CTA of lower limbs reviewed, only 45 were traceable. A total of 60% of patients showed at least mild degree of stenosis in the internal iliac artery and 48.9% of these were bilateral. Symptoms of erectile dysfunction were reported in 40.4% of the individuals and 8.9% had severe stenosis or occlusion in their internal iliac artery. Meanwhile, 37.8% showed no stenosis and erectile dysfunction.

Conclusion: Although other important risk factors are yet to be identified, there was increasing evidence suggesting a correlation between erectile dysfunction and vascular insufficiency such as atherosclerosis and hyperlipidaemia. Thus, a more effective treatment focusing on the artery can be practised alongside the current oral medication in Malaysia.

Keywords: Atherosclerosis, CT angiography, impotence, radiology, vascular insufficiency

The Factors Affecting Polycyclic Hydrocarbon in Human Semen Sample and Their Effects on Sperm Quality

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Background and aims: Polycyclic aromatic hydrocarbons (PAH) are ubiquitous pollutants found in the environment that could impact fertility. This study investigated the factors affecting PAH levels in human semen sample and their effects on sperm quality.

Materials and methods: In this cross-sectional study, 32 semen samples were collected at the Universiti Kebangsaan Malaysia Medical Centre fertility clinic. Subjects were divided into normal ($>15 \times 10^6$ sperm/ml, $n = 23$) and low sperm count ($<15 \times 10^6$ sperm/ml; $n = 9$) groups and the analyses were conducted based on WHO guidelines. The level of PAH was determined using mass spectrometry technique. Each subject was also given a set of questionnaire to assess their exposure towards PAH.

Results: There was a significant association between the presence of PAH and sperm concentration ($p < 0.05$). PAH was also found to be higher in older subjects ($p < 0.05$). However, insignificance was noted with regard to sperm motility and PAH; motile ($p = 0.299$), non-progressive ($p = 0.576$) and immotile ($p = 0.204$). No impact was noted statistically on semen volume ($p = 0.197$) and pH ($p = 0.262$). The number of PAH types present in the samples of smokers and non-smokers were also insignificant ($p = 0.277$). A weak relationship was seen between the average daily cigars intake and the number of PAH types ($p = 0.805$).

Conclusion: Factors affecting the level of PAH and its effects on sperm quality were not entirely established in this study due to its limited sample size. Only the sperm concentration was found to be impacted from it with age playing a role in influencing PAH content.

Keywords: Fertility, smoking, environmental pollution, oligospermia

Quality of Asthma Care at a Primary Care Clinic: An Audit of Documentation Related to Assessment and Management

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Background and aims: Good documentation of asthma assessment and management is vital to determine quality of asthma care. This study aimed to examine the documentation at a university-based primary care clinic in Kuala Lumpur. Presence of treatment adjustment and the availability of resources were also assessed.

Materials and methods: This retrospective study involved auditing documentation of the last visit in the medical records of 433 adult patients with asthma who had follow-up within the last two years. Socio-demographic profile and presence of documentation related to asthma symptoms, as well as status of control were recorded. Presences= of treatment adjustment and types of medications were assessed using pharmacy data system. Availability of resources needed for optimum asthma care in each consulting room was verified.

Results: Documentation of asthma assessment ranged between 6.9% and 43.4%. The three assessments with poorest documentation were inhaler technique (6.9%), activity limitation (19.6%) and peak flow measurement (20.6%). Among 188 patients with documented asthma control, majority were controlled (68.6%), followed by partially control (16.5%) and poor control (14.9%). Treatment was adjusted in 16.9% of patients; those with poor controlled asthma had 6.76 odds to have treatment adjustment compared to controlled patients ($p < 0.001$). Out of 24 consultation rooms, peak flow meter (66.7%), reference chart for peak flow meter (75%), printed patient educational material (4.17%), published asthma guideline (4.17%), spacer for inhaler and placebo inhaler (0%) were available.

Conclusion: Poor documentation of asthma assessment was common. Thus, quality of asthma care was difficult to be determined. To ensure proper evaluation of the quality, documentation should be improved. Patients with poor controlled asthma were more likely to receive treatment adjustment by doctors compared to those with controlled asthma, which suggested that appropriate management had been delivered. However, availability of resources was inadequate.

Keywords: Asthma, clinical audit, disease management, general practitioner, quality

A 13-Years Trend Analysis of Malaria Cases in the Teaching Hospital of Universiti Kebangsaan Malaysia Medical Centre

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Background and aims: Malaria is one of the leading causes of death worldwide and poses significant health risks in Malaysia. This study aimed to determine the trend of malaria among patients seeking treatment over 13 years at Universiti Kebangsaan Malaysia Medical Centre (UKMMC).

Materials and methods: The 13-years microscopy data were extracted retrospectively at UKMMC from 2005 to 2017. Epidemiological and clinical aspects were reviewed. Two nested PCR protocols were performed to identify markers for artemisinin-resistance in falciparum malaria. Descriptive statistics, time series and curve estimation analysis were used to evaluate trends in the data.

Results: Over 13 years, 2968 blood films were requested for malaria diagnosis at UKMMC. Out of this, 85 (2.9%) were microscopically confirmed malaria cases. *Plasmodium falciparum*, *Plasmodium vivax* and mixed *Plasmodium* infections accounted for 34.4%, 32.3%, and 11.8% of all malaria cases, respectively. Malaria was reported in all nationalities and both sexes, but its positivity rate was significantly higher in Malaysian ($p<0.001$) and in males ($p<0.001$) than their counterparts. Overall, malaria prevalence was significantly high in foreign cases than in local (10.1% vs. 1.8%, $p<0.001$). Similarly, malaria species-specific prevalence was significantly high for *P. falciparum* ($p<0.001$) and *P. vivax* ($p<0.001$) in foreign cases, while *P. knowlesi* was only observed in local cases. Except the significant reduction in *P. vivax* ($R^2=0.458$, $p=0.011$), analysis of curve estimation models did not show statistically significant values for malaria positivity rates and species-specific prevalence during the 13 years. In addition, of the six archived blood films, only one sample was successfully amplified for *P. falciparum* DNA. No artemisinin-resistance gene mutation was observed.

Conclusion: In relative terms, the overall positivity rate of malaria cases in the UKMMC over 13 years showed a downward reduction, but its magnitude as a public health problem is still alarming.

Keywords: Malaria, retrospective studies, epidemiology

The Incidence of Low Anti Mullerian Hormone Level in Patients Diagnosed as Polycystic Ovarian Syndrome in Universiti Kebangsaan Malaysia Medical Centre

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Background and aims: Polycystic ovarian syndrome (PCOS) is currently diagnosed with Rotterdam criteria based on international consensus. However, this practice leads to misdiagnosis as some of the patients who have primary ovarian failure (POF) are labelled as PCOS. This discrepancy can only be proven by evaluating the Anti Mullerian Hormone (AMH) level among PCOS patients. This misdiagnosis leads to mismanagement. The main aim of the study was to investigate the low AMH level in patients who were diagnosed as PCOS, and the risk factors and their fertility outcome.

Materials and methods: We performed this retrospective cohort study with a total of 124 patients recruited from year 2015 to 2017 based on inclusion criteria of (i) women who were within the age of 18-40 years, (ii) patients who were diagnosed with PCOS and (iii) patients with no Mullerian agenesis. All these patients were evaluated for AMH level.

Results: Overall population are considered young; mean age; 34.71. Mean BMI was overweight; 27.84 kg/m². From 124 patients, 48 were taken for sub-analysed as noted low AMH level. The lowest AMH level was 5.5 pmol/l and the highest was 18.93 pmol/l. All the risk factors (smoking; $p>0.05$, age of menarche; $p>0.05$) and fertility outcome were not correlated to the level of AMH; (biochemical pregnancy; $p>0.05$, clinical pregnancy; $p>0.05$, numbers of miscarriage $p>0.05$)

Conclusion: The level of AMH should be added as one of the criteria to diagnose PCOS as it allows us to differentiate the possible hidden diagnosis of premature ovarian failure which can jeopardize the patient's outcome.

Keywords: Infertility, primary ovarian insufficiency, women

Anti-C1q Antibodies in Lupus Nephritis and Non-Lupus Nephritis Patients: A Case-Control Study

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Background and aims: This study was a novel study involving various clinical aspects of SLE in LN and non-LN patients in association with anti-C1q antibodies. The objective of this study was to determine the levels of anti-C1q antibodies in Lupus Nephritis (LN) and Non-Lupus Nephritis (Non-LN) with relation to the disease activity, target organs damage and various treatments conferred to the patients.

Materials and methods: Patients were recruited using convenient sampling method. Blood samples and information were obtained in a prospective case control study from 74 SLE patients taken from clinics and wards. Patients who were aged less than 18 years, had positive family history, were Human Immunodeficiency Virus positive, pregnant, and had acute infections were excluded. The samples were then analysed for anti-C1q antibodies level using ELISA.

Results: The median anti-C1q antibodies level for the study population was 0 U/ml, there were 38 LN and 36 non-LN patients. However, there was no statistical significance comparing anti-C1q antibodies between LN and non-LN ($p=0.105$). The median anti-C1q antibodies levels for LN was 0 U/ml (IQR 8.39) while for non-LN it was 0.58 U/ml (IQR 13.99). In LN group, anti-C1q antibodies showed statistical significant association with disease activity ($p=0.028$) and organ damage index ($p=0.017$). While in non-LN, anti-C1q antibodies showed no significant association with disease activity ($p=1.0$) and organ damage index ($p=0.502$). In both LN and non-LN, treatments with various immunosuppressants, ethnics group and gender showed no statistical significance ($p>0.05$).

Conclusion: Serum levels of anti-C1q antibodies showed statistically significant association with severity of disease and end organ damage index in LN patients. However, we did not see the associations in non-LN patients. Thus, anti-C1q

antibodies may have a role in assessment of severity of disease and end organ damage index in LN patients.

Keywords: C1q, complements, lupus nephritis, medications, systemic lupus erythematosus

Patients' Satisfactory on the Usage of WhatsApp In Post-Coronary Angiogram Discharge Care in Universiti Kebangsaan Malaysia Medical Centre

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Background and aims: WhatsApp is a popular mobile messaging application which has increasingly been implemented in our healthcare system to enhance communication. The aim of the study was to evaluate patients' perception and satisfactory level on the use of WhatsApp in post-coronary angiogram intervention discharge care in Universiti Kebangsaan Malaysia Medical Centre (UKMMC).

Materials and methods: In this prospective study, a total number of 36 post-coronary angiogram patients were conveniently approached to assess their perception and satisfactory level on the usage of WhatsApp service via modified Telehealth Usability Questionnaire.

Results: Moderately high number of patients (72.2%) were satisfied with the WhatsApp follow-up. Patients mostly agreed with the ease and learnability of WhatsApp with the mean score of 85.85/100 followed by interface quality with mean score 82.22/100, WhatsApp usefulness with mean score of 79.51/100 and interaction quality with mean score 69.58/100. While the least agreed domain was reliability with mean score of 65.56/100. There was significant association between patient's age ($p=0.002$, $p<0.05$) and gender ($p=0.006$, $p<0.05$) with their satisfactory level.

Conclusion: Patients, especially men and older people, were generally satisfied with the usage of WhatsApp service in post-coronary angiogram intervention discharge care. Healthcare providers may consider integrating to the usage of online communication services as part of discharge plan for patients post-coronary angiogram interventions with modification to improve its interaction quality

and reliability. This services perhaps can be explored to other day-care surgical procedures using Random Control Trial approach in addition to explore its cost-effectiveness and impact on clinical workload.

Keywords: Patient satisfaction, Smartphone, Telemedicine, Text messaging, WhatsApp

Anaemia in Human Immunodeficiency Virus Patients: A Retrospective Analysis in Tertiary Hospital

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Background and aims: Human Immunodeficiency Virus (HIV) causes a myriad of clinical manifestations. There is limited data on haematological manifestations in HIV patients in Malaysia. The aim of this study was to determine the proportion and severity of anaemia among HIV patients who were seen in a tertiary level hospital in Malaysia.

Materials and methods: A retrospective observational study was conducted for three months in infectious disease clinic and medical wards in Universiti Kebangsaan Malaysia Medical Centre. Demographic data, clinical parameters and treatment of HIV patients were retrieved from patients' files and hospital electronic data system. Definition and severity of anaemia was based on World Health Organization 2011.

Results: A total of 168 patients were included in this study. They were predominantly male, 150 (89.3%). A total of 54.8% of patients were Malays followed by Chinese, 39.9% and the remaining were Indians, 5.4%. Of 168 patients, 142 had full blood count results at diagnosis. The mean haemoglobin level at diagnosis was 12.07 g/dL \pm 2.24. Eighty-five (59.9%) patients were found to have anaemia at diagnosis. Based on the severity, 47.0 % had mild anaemia, 49.4 % moderate while 3.6% were severe. Among the patients with anaemia, there were no differences in severity according to gender, ethnicity and age at diagnosis. Out of 85 patients with anaemia at diagnosis, 49 patients had available CD4 count in which 51% had CD4 less than 200 μ L. Majority (76.5%) of patients received a combination of nucleoside reverse transcriptase inhibitors (NRTIs) and non-nucleoside reverse transcriptase inhibitors (NNRTIs).

Conclusion: In this single tertiary institution study, anaemia was found to be common among HIV patients at diagnosis and majority had mild to moderate anaemia. It would be interesting to ascertain the type and causes of anaemia and further determine the impact of treatment on this haematological problem.

Keywords: Haemoglobin, retroviral, haematology

Sensitisation to Common Allergen among Children, Adolescents and Adults with Allergic Diseases

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Background and aims: Allergy is an abnormally high immunologic sensitivity to certain stimuli like drugs, foods, environmental irritants and microorganism. Allergen avoidance is a part of allergy management. Therefore, patients with allergic diseases need to know the type of allergens that they sensitised to. This study determined the prevalence of allergic sensitisation to common allergen among children, adolescents and adults with allergic diseases and its association in Universiti Kebangsaan Malaysia Medical Center (UKMMC).

Materials and methods: This was a retrospective study of the skin prick test (SPT) results and allergy proforma done in Allergy Centre, UKMMC from 2013 to 2017. Patients were categorised into adult, adolescent and children according to World Health Organization (WHO) criteria. All patients with allergic diseases and had a SPT were included in the study. The database of SPT results and patients' allergy proforma were reviewed. The results were analysed using SPSS version 23.

Results: From the total of 657 patients that included in this study, 23.9% (n=157) were children, 19.6% (n=129) were adolescent and 56.5% (n=371) were adult. A total of 85.1% showed positive SPT results with a total of 3165 sensitisations were observed. Majority of patients sensitised to aeroallergen (64.45%) followed by food allergen (33.9%) and contact allergen (1.64%). The most common aeroallergen sensitised was *Dermatophagoides Pteronyssinus* (children: 66.2%, adolescent: 72.1%, adult: 63.6%). The highest food allergen sensitisation in children was prawn (25.48%). However, crab was the highest food sensitisation in adolescent (30.23%) and adult (27.49%). The contact allergen tested in this study was latex (children: 2.55%, adolescent: 8.53%, adult: 9.97%).

Conclusion: This study represents a common allergen sensitisation in patients with allergic diseases residing in urban areas. SPT helps to determine the types of allergen that patients sensitised to; hence the allergic diseases can be managed accordingly.

Keywords: Allergen, allergy, immunologic, sensitisation

Assessment of Knowledge, Attitude and Practice Among House Officers in Universiti Kebangsaan Malaysia Medical Centre on Needle Stick Injuries

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Background and aims: Needle stick injury is one of the most serious occupational hazards among house officers which may lead to possible severe consequences such as Human Immunodeficiency Virus infection, Hepatitis B and C virus transmission. The aim of the study was to explore and compare the knowledge, attitude and practice (KAP) among house officers in UKM Medical Centre (UKMMC) regarding needle stick injury.

Materials and methods: A cross-sectional study was conducted with total of 149 self-administered questionnaires were collected from the house officers in UKMMC during a period of five months. The data was collected via universal sampling method. Components evaluated were demographic data and scores on KAP regarding needle stick injury of the house officers.

Results: Out of 149 house officers recruited for the study, 34.9% of them had history of needle stick injury during their practice, with 6.7% of the injury occurred in their currently posted department. There was significant association between history of needle stick injury and practice of house officers ($p=0.035$). House officers with history of needle stick injury had lower mean score of practice (8.65 ± 2.00) compared to those without history (9.40 ± 1.09). This study also demonstrated that there were significant correlations between Knowledge-Practice ($r=0.194$, $p=0.018$) and Attitude-Practice ($r=0.182$, $p=0.026$) of UKMMC house officers.

Conclusion: This finding showed that good level of knowledge and attitude results in better practice of the house officers, thereby reducing the incidence of needle stick injury. Therefore, suitable health education program with regards to needle stick injury and preventive measure should be intensively implemented to all house officers prior to their practice.

Keywords: Sharps injuries, blood-borne pathogens, health personnel, hospital, post exposure prophylaxis

Clinical Waste Management and It's Cost Implication among Healthcare Workers at Surgical Based Wards in Universiti Kebangsaan Malaysia Medical Centre

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Background and aims: Clinical waste management (CWM) requires effective handling of waste at any health institution. Aim of the study was to assess the knowledge, attitude and practice (KAP) on the CWM among health care workers (HCW) and to determine its implication on the disposal cost.

Methods and materials: This cross-sectional study include healthcare workers from department of Internal Medicine, Orthopaedic, Surgery and Obstetrics & Gynaecology wards. The participants were selected through simple random sampling to answer a validated questionnaire after their written consent obtained. The questionnaire consists of demography and KAP on CWM. Later, the clinical waste was weighed, and the number of patients was recorded from each department on the same day. To determine the cost, incur per department, the weight per patient (kg/patient) was multiplied with RM5.50 as the disposal cost.

Results: A total of 150 participants were enrolled in the study. Most of them (65.6%) are staff nurses. Majority of them (65.6%) aged between 26 and 35-year-old. About 26.5% of participants work at the Internal Medicine, 25.2% at O&G, 24.5% at Surgery, and 23.8% at Orthopaedic department. About 52.3% HCW have their service less than 5 years. Staff nurses have a significant higher knowledge score than doctors for CWM ($t=2.597$; $p=0.011$). However, doctors have better attitude towards CWM than staff nurses ($t=1.972$; $p=0.051$). And again, staff nurses have a better practice score compared to doctors ($t=0.450$; 0.653), which was not significance. Those who worked at UKMMC less than 5 years were found to have the lowest scores of knowledge ($F=4.457$; $p=0.005$) and practice ($F=1.179$; $p=0.320$), but highest score for attitude ($F=4.034$; $p=0.009$) on CWM. On the other hand, the highest scores for knowledge and practice were seen among those worked between 6 and 10 year of service. KAP on CWM was not significantly different between levels of education of the participants. Among the departments, Internal Medicine participants have better knowledge and attitude, and O&G for good practice compared to other departments in CWM, but not significant. Weight of the waste produced was correlated inversely with the score of the knowledge ($r= - 0.037$; $p=0.650$) and the practice ($r= - 0.195$; $p=0.015$) and correlated directly

with the attitude score ($r= 0.049$; $p= 0.551$). The daily cost incur per occupied bed for clinical waste disposal was comparatively higher for the Department of Internal Medicine (RM3.91) and Surgery (RM3.69), compared with the Department of O&G (RM2.70), and Orthopaedic (RM1.65).

Conclusion: Good practice on CWM significantly reduced the waste weight per patient at UKMMC. In addition, the amount incurred was actually much lower than the European Union quality standards of between USD1.00 to 3.00 (RM4.20 to 12.60) per bed per day. However, the aspect of KAP need strengthening especially among those who just enter the healthcare service for further reduction of clinical wastes produced at all levels and departments.

Keywords: Attitude, clinical waste, knowledge, generation, practice

Five-Year Incidence of Post-Dural Puncture Headache among Parturients in Universiti Kebangsaan Malaysia Medical Centre

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Background and aims: Post-dural puncture headache (PDPH) is one of the complications following inadvertent dural puncture with epidural needle. The conservative management for PDPH are bed rest, good hydration and simple oral analgesics. If unresolved, epidural blood patch (EBP) is performed. In Universiti Kebangsaan Malaysia Medical Centre (UKMMC), approximately 6000 deliveries were conducted every year, and about 17% of parturients opted for epidural labour analgesia (ELA). We embarked on this study to investigate the incidence of PDPH in UKMMC over the last five years as a means to improve the ELA service.

Materials and methods: This retrospective observational study was conducted in a ten-bedded delivery suite of UKMMC. Data was collected from the compiled follow-up forms of parturients who received ELA from 1st January 2013 until 31st December 2017.

Results: From a total of 5486 parturients' data which were analysed, there were 29 cases of accidental dural puncture, of which 12 parturients developed PDPH. Hence, the incidences of accidental dural puncture and PDPH over the last five years were 5 and 2 per 1000 population, respectively. From 22 cases of observed cerebrospinal fluid leak during ELA, 12 (54.5%) procedures were abandoned, 8 (36.4%) had their epidural resited and 2 (9.1%) received intrathecal catheter. The difference of effectiveness between the conservative management of PDPH was not significant ($p = 0.325$). Five (41.7%) of the parturients who had PDPH required EBP.

Conclusion: The 5-year incidence of PDPH following inadvertent dural puncture was low. In such event, most anaesthesiologists chose to abandon the procedure. There was no significant difference in effectiveness of treatment options for PDPH.

Keywords: Analgesia, epidural, headache, labour, obstetrics

The Prevalence of Big Five Personality Traits among Final Year Medical Students and its Relationship to Stress Level and Coping Mechanism

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Background and aims: Each human being exhibits their own personality traits and it is essential in almost every aspect of stress and coping. This study aimed to investigate the relationship between the big five personality traits, coping mechanisms and stress level among final year medical students of Universiti Kebangsaan Malaysia (UKM).

Materials and methods: In this cross-sectional study, 152 final year medical students batch 2017/2018 were randomly selected, excluding those who has chronic diseases, married and repeated final year. The questionnaires used were Big Five Personality Inventory and 12-Item General Health Questionnaire. An open-ended question was used to determine how the respondents cope with their stress. Data was analysed using SPSS 20.0.

Results: Agreeableness was the most common personality trait portrayed among the students, whereas Openness to Experience appeared to be the least. The Big Five Personality Traits were significantly related to coping mechanisms ($p=0.016$; $p<0.05$). Students with Neuroticism personality had the highest rate of practicing avoidant coping mechanism, while students with Extraversion personality had the highest rate of practicing active coping mechanism. There was a significant difference in total score of stress between the different personality traits ($p<0.001$; $p<0.05$). However, the Big Five Personality Traits and level of stress showed no significant results on academic performance with the p value of 0.359 ($p>0.05$) and 0.94 ($p>0.05$) respectively.

Conclusion: The Big Five Personality Traits are beneficial for final year medical students to identify the most effective coping mechanism to reduce their stress in medical field.

Keywords: Academic performance, emotion, Extraversion, Neuroticism, psychology

Perceptions of Mentors and Mentees Towards the Mentoring System of UKM Medical Centre

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Background and aim: Mentoring is a relationship between the mentor and the protégé. It has been recognized as a catalyst for career success and advancement. Despite that, there was little research done regarding this subject especially in Malaysia. The aim of this study was to ascertain the perception of students and lecturers towards mentoring system in Universiti Kebangsaan Malaysia Medical Centre (UKMMC).

Materials & Methods: This was a cross sectional study involving all medical students (n=384) from Year 2 until Year 5 and lecturers (n=35) who were involved as undergraduate mentors in UKMMC. Online questionnaires were distributed using Google Forms. The data was analyzed using Statistical Package for the Social Sciences (SPSS) software.

Results: Mentors (97.2%) agreed that they have good communication and interaction with their mentees. Mentees (93%) conceded that they have good relationship with their mentors. Mentors (94.3%) acknowledged that it is essential to have additional training. Mentors (82.9%) opined that the number of mentoring sessions were sufficient. Both mentors (62.8%) and mentees (86%) were satisfied with the current mentoring system in UKMMC. Mentees (87.7%) preferred to choose their own mentors. Both second year and third year medical students have significantly better perception towards the mentoring system compared to fourth year medical students ($P<0.05$). Malay mentors significantly gained better effects and impacts compared to their Chinese counterparts ($P<0.05$).

Conclusion: Successful mentoring system is important to career success and satisfaction for both mentors and mentees. However, future study is needed to come out with elements required for effective mentoring system so that this program can be maintained since it appears to be beneficial to mentors' and mentees' personal and professional development.

Keywords: Medical Education, Medical School, Medical Student, Professional Competence, Undergraduates

Prevalence and Risk Factors Associated with Surgical Site Infection in Colorectal Surgery in A Teaching Hospital

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Background and aims: Surgical site infection (SSI) is the most common hospital acquired infection. It has high prevalence in low- and middle-income countries and affects up to one third of patients who have undergone a surgical procedure. This study is conducted to identify the risk factors for surgical site infection in patients who underwent colorectal surgery from 2010 to 2017 in our institution.

Materials and methods: All patients who have undergone colorectal surgery between year of 2010 and 2017 in Universiti Kebangsaan Malaysia Medical Centre were recruited. Demographic data and known risk factors of unfavourable post operative outcome were analysed for association with SSI.

Results: A total of 167 patients were recruited with a prevalence of surgical site infection of 16.2% (n= 27). Open colorectal surgery was a significant risk factor for surgical site infection (p=0.01). Apart from that, skin closure using stapler (p=0.004); preoperative haemoglobin level of <10g/dl (p=0.032); blood loss > 400mls during surgery (p=0.000) and blood transfusion during surgery (p=0.000) was associated with higher wound infection rates.

Conclusion: There are multiple patients and procedural risk factors associated with SSI in colorectal surgery. From our study, significant risk factors include open colorectal surgery, skin closure using stapler, preoperative haemoglobin <10g/dl, blood loss >400mls during surgery and blood transfusion. Our findings were in line with other studies on this topic although some of the results were not statistically significant due to our limited sample size. We observed that most of the detected risk factors were reversible. Hence a reduction in infection risk would reduce the morbidity, mortality, hospital readmission or long stay and financial burden to the low- and middle-income families.

Keywords: Epidemiology, Colorectal surgery, Surgical site infection

Puberty and Menstrual Pattern in Blood Transfusion Dependent Thalassaemia Major Patients

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Background and aims: Blood transfusion dependent Thalassaemia Major patients usually experienced abnormal pubertal growth and menstrual pattern. The main aim of the study was to describe the pubertal growth, menstrual pattern and determine predictors for delay puberty and menarche.

Methods and materials: In this cross-sectional questionnaire study, a total number of 135 female, age above 12-year-old were recruited. They completed the Tanner staging chart and menstrual cycle questionnaire. Factors affecting their pubertal growth and menstrual pattern were studied.

Results: A data of 135 participants was presented. The mean age was 19.46±5.462. Majority of the participants were Malay (78.5%), followed by Chinese (9.6%) and others (11.9%). Most of the participants (81.5%) developed thelarche prior to pubarche. A vast majority (85.93%) had delayed thelarche when compared with norm. Half (54.81%) had regular menstrual cycle whereas 26.37% had irregular menstrual cycle and a fifth (18.52%) was still amenorrhoeic. Those diagnosed before the age of two, had significantly delayed menarche with no significant difference in thelarche. The duration of blood transfusion and iron chelating agent had positive correlation with the age of menarche ($r=0.443$, $r=0.361$) and thelarche ($r=0.335$, $r=0.319$). The use of iron chelating agent was significantly associated with delay in thelarche but not menarche. There was significant association between type of chelating agent and age of menarche but not with age of thelarche. Those who started iron chelating agent after 3 years since they received blood transfusion showed significant delay in menarche but no significant difference in thelarche.

Conclusion: There was a significant delay in pubertal growth and menstrual pattern in blood transfusion dependent Thalassaemia Major patients. The longer the duration of blood transfusion and usage of iron chelating agents, the more likelihood of developing delayed thelarche and menarche.

Keywords: Thalassaemia, blood transfusion, menarche, iron chelating agents

Factors Influencing Patient's Visual Function Post-Multifocal Intraocular Lens Implantation

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Background and aims: Multifocal intraocular lenses (IOLs) are designed to restore near and intermediate visions which in turn reduce the spectacle dependency of cataract patients post surgery. This study aimed to compare vision-related quality of life using the National Eye Institute Visual Function Questionnaire (NEI VFQ-25) in patients with monofocal and multifocal intraocular lenses.

Materials and methods: This cross sectional comparative study involved patients having cataract surgery with implantation of monofocal IOLs (Group A) and multifocal IOLs (Group B). The patients were recruited from Universiti Kebangsaan Malaysia Medical Centre Ophthalmology Clinic and *Pusat Pakar Mata Bangi*. The quality of near, intermediate, distant visions, social and emotional effects and overall satisfaction among the patients were evaluated using NEI VFQ-25. The visual function score from both groups were associated to various external factors. One of them was the personality type and was evaluated using The Big Five Personality Test.

Results: A total of 48 eyes (43 patients) were enrolled in this study with the age range of 40 to 80. There was no significant difference in patients' perception on their visual function between both groups. None of the factors studied were significantly associated with the visual satisfaction. However, it is observed that in terms of waiting time, those who waited <4 weeks had the highest general vision score while who waited >13 weeks had the lowest in both groups. Moreover, those patients with dominant neuroticism in both groups had the lowest general vision score as compared to other personality traits.

Conclusion: The type of intraocular lenses and other external factors such as personality type might affect the visual function of the patients. The pre-operation counseling probably should have tailored to the personality type in order to improve the patients' satisfaction with the intraocular lenses.

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C01

Level of Stress, Fatigue and Sleepiness among Emergency Medical Service Ambulance Driver in Hospital Kuala Lumpur

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Introduction: Mitigation measures of stress, fatigue and sleepiness among Emergency Medical Service (EMS) ambulance driver is the most important field of studies because it involves the safety and the life of a rescuer team members, a survivor or patient and the public.

Objective: To measure the level of self-reported of stress, fatigue and sleepiness among EMS ambulance driver in Hospital Kuala Lumpur, Malaysia.

Methods: A cross-sectional and descriptive study using a target population sampling among 31 EMS ambulance driver was conducted using self-fill-in questionnaire of Perceived Stress Scale (PSS), Chalder Fatigue Scale (CFS) and Epworth Sleepiness Scale (ESS) among EMS ambulance driver in HKL.

Results: Stress, fatigue and sleepiness risk measures among 31 respondents for the PSS show 24 (78%) were in the moderate category while one respondent having high PSS and 6 (19%) respondents are in low PSS. The CFS found a total of 24 (77%) respondents are under 'caseness' while only 7 (23%) are under 'non-caseness'. While the ESS indicates that 20 (65%) respondents having an excessive sleepiness during daytime while 11 (35%) are free from sleepiness during daytime. Hypothesis testing revealed that all three hypotheses have significant relationship. In addition, the prevalence of near-miss accident is relatively high (74%) and fell asleep during driving also significant (52%).

Conclusion: This finding highlights the importance of stress, fatigue and sleepiness screening, providing appropriate training, support and provide the necessary facilities to prevent the development of adverse health consequences among EMS ambulance driver.

C02

Bilateral Symmetry in Four Os Coxal Measurements on Reconstructed Three-Dimensional Computed Tomography Pelvic Model

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Introduction: In forensic sciences, population-specific morphometric standards for sex estimation is mainly established from os coxa. Researchers use either both sides of the os coxa or only one side, in the sample. Prior to using either side, bilateral variation of the coxal bones has to be assessed.

Objective: This study examined the bilateral variation (asymmetry) between the right and left os coxa from four measurements on three-dimensional computed tomography (3DCT) pelvic models.

Methods: A total of 164 multidetector computed tomography (MDCT) scans were sampled. The MDCT scans were segmented using 3D Slicer. Four measurements (1-minimum iliac breadth, 2-maximum pubic length, 3-minimum pubic length, 4-anterior superior iliac spine-symphysion), on each right and left os coxa were acquired using Stratovan Checkpoint. The measurements were analyzed with a paired sample T-test.

Results: Data were found to be normally distributed by the Kolmogorov-Smirnov test. The means of all four measurements were not significantly different between the right and left os coxa.

Conclusion: All four measurements of the coxal bone were symmetrical. The findings indicated that in further study using these four measurements, particularly in forensic sciences for sex estimation, researchers may use either the right or left os coxa.

C03

Anthropometric Study of the Glenoid Cavity on Three-Dimensional Computed Tomography Images According to Age Group.

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Introduction: Morphometric study of glenoid cavity has been studied for its capability in forensic identification of skeletal remains especially in sex determination. However, there was lack of morphometric study on glenoid cavity according to age group.

Objective: The purpose of the study was to explore the age group differences between sexes in the morphometric study of the glenoid cavity in Malaysian population.

Methods: This retrospective study comprised 270 three-dimensional (3D) computed tomography (CT) images of the glenoid cavity in 142 females and 138 males. The images were classified into three different age groups (20-39 years [young adult], 40-59 years [middle-aged] and 60-79 years [elderly]) before measurements of the glenoid cavity were taken. Glenoid cavity length (GCL) and breadth (GCB) were measured from the 3D CT images. Two-way analysis of variance (Factorial ANOVA) was conducted to assess the age group differences of the morphometric study of glenoid cavity in relation to sex.

Results: Significant interaction effect between sex and age groups was displayed by GCL ($p < 0.05$) only. Post-hoc test of the GCL showed that glenoid cavity of the young adult group in male was significantly different from that of the middle-aged and elderly groups. Besides, there was no difference in glenoid cavity measurements in female across all age groups.

Conclusion: In conclusion, there was presence of anatomic variation of the glenoid cavity in male and female among different age groups. This would suggest that identification based on different sexes could contribute to significant changes in different age groups.

C04

A Comparative Study between Non-selective Laryngeal Reinnervation and Type 1 Thyroplasty in Patients with Unilateral Vocal Fold Paralysis

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Objective: To compare the multidimensional voice outcomes between non-selective laryngeal re-innervation (LR) and type 1 thyroplasty in patients with unilateral vocal fold paralysis (UVFP).

Method: The study included 14 patients with UVFP who underwent either LR (7 patients) or thyroplasty (7 patients) between 2015 and 2017 who fulfilled the inclusion criteria. The outcomes were measured subjectively and objectively with: 1) voice handicap index-10 (VHI-10 Malay version); 2) visual analogue score (VAS) for voice; 3) auditory perceptual evaluation using the breathiness component of GRBAS scale; 4) maximum phonation time (MPT); and 5) acoustic analysis (jitter%, shimmer% and NHR) using OperaVOX™. The outcomes were measured at baseline, 1-, 3-, 6- and 12-months post-operative. The comparison of outcomes between pre- and postoperative of each group and comparison of outcomes between 2 groups.

Results: Comparison of each group at different time points showed significant improvement of VHI-10 and MPT of LR group between 3 and 12 months ($P = 0.05$) whereas the improvement in thyroplasty group was observed at all time points ($P = 0.05$). When comparing between the 2 groups at 12 months the VHI-10 and MPT was significantly better in the LR group than thyroplasty group with $p = 0.004$ and $p = 0.001$ respectively. Other outcome measures did not reveal significant difference.

Conclusion: This case series showed that LR may be better than thyroplasty in improving VHI-10 and MPT selected patients with UVFP.

C05

Surgical Outcomes of Laryngomalacia at UKMMC: A 9-year Review

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Introduction: The commonest cause of stridor in children is laryngomalacia. Various maternal, infant/ neonatal, social, and genetic factors have been reported to be associated with the condition. Most (75%) stridor patients are managed conservatively; around a quarter of cases require surgery, which has been reported to be safe in early childhood.

Methods: A cross-sectional study was conducted. Case files of children who were operated for laryngomalacia at Universiti Kebangsaan Malaysia Medical Center (UKMMC) between 2009 and 2017 were obtained. They were reviewed in terms of sociodemography, pregnancy and delivery, symptoms, comorbidities, investigations diagnosis, operative parameters, and clinical outcomes.

Results: There were 10 males and 14 females. The mean age was 9.4 months (range: 0.7-36.5). Secondary airway lesions (vocal cord palsy, laryngeal cleft, choanal atresia, vallecular cyst, and accessory larynx) were present in 16.7% of cases. All of them underwent supraglottoplasty and aryepiglottoplasty. Median duration of hospital stay was 5 days. Half of the patients had their laryngomalacia resolved, while the rest improved. The average time taken for complete resolution of main symptoms was 3 weeks.

Conclusion: The co-morbidities in this study were in line with those in literature. The surgical outcome of laryngomalacia is generally good. Counseling is recommended for patients with significant comorbidities.

C06

Occult Breast Carcinoma Presenting as Axillary Nodal Metastasis: A Diagnostic Challenge

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Introduction: Occult primary breast carcinoma (OBC) presenting as axillary nodal metastasis without a breast primary is extremely rare. It poses as a diagnostic challenge to the pathologists. Here, we report a case of OBC with emphasis on the utility of immunohistochemistry to determine the primary site of tumour.

Method: Case report

Result: A 58-year-old female presented with a 3-cm painless right axillary mass. There were no associated constitutional symptoms. Ultrasound evaluation of the right axilla identified an enlarged lymph node with thickened cortex and mixed vascularity (hilar and peripheral vascularity), suspicious of a metastatic disease. A thorough radiological investigation that includes mammogram, ultrasonography of the breast and positron emission tomography (PET) scan failed to determine the primary site of the tumour. Subsequently, a right axillary lymph node biopsy was performed. Histological examination of the lymph node revealed partial effacement of nodal architecture with loose cohesive sheets of poorly differentiated malignant cells, without discernible glandular or squamous differentiation. Immunohistochemically, the malignant cells demonstrated pan-cytokeratin (CK) and CK7 diffuse immunopositivity. Leukocyte common antigen (LCA), CK20 and S100 were negative. A second panel of immunomarkers was performed. The malignant cells expressed GATA-3, GCDFP-15 and mammaglobin (breast-specific markers), and were negative for TTF-1, ER and PR immunohistochemistry. A diagnosis of OBC was made.

Discussion: Breast primary must always be considered in the differential diagnosis in patients with sole presentation of axillary lymphadenopathy. The pivotal role of breast-specific immunomarkers in the diagnosis of ER, PR-negative OBC cannot be overemphasized.

C07

HbA1c levels in hypothyroid patients before and after 6 months treatment

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Introduction: HbA1c is an important tool to monitor and diagnose diabetes mellitus (DM). Conditions affecting erythrocyte turnover or survival can lead to misinterpretation. Thyroid hormone stimulates erythrocyte production and hypothyroidism often results in hypo-proliferative erythropoiesis. We investigated if hypothyroidism affects HbA1c levels.

Objectives: To evaluate HbA1c measurements in hypothyroid patients.

Methods: We conducted a cohort study of hypothyroid patients to measure HbA1c and reticulocyte count before and after 6 months of treatment. Patients with history of DM, chronic kidney disease or haematological diseases were excluded. Thyroid stimulating hormone (TSH), free thyroxine (FT4) and fasting blood glucose (FBS) were also measured. All patients gave their consent and the study did not affect standard patient care. Significant differences between baseline and 6 months were determined by paired-samples T-test. Pearson correlation was used to identify associations between variables.

Results: A total of 90 patients (54 women, age 50 ± 14 years) were studied. After 6 months treatment, there was a significant increase in FT4 (mean paired difference +3.6 pmol/l, $p < 0.001$) and reticulocyte count (+0.2%, $p < 0.001$) with a significant decrease in TSH (-15.6 IU/l, $p < 0.001$), HbA1c (-0.2%, $p < 0.001$) and FBS (-0.4 mmol/l, $p = 0.001$). Pre-treatment levels of HbA1c correlated significantly with FT4 ($r = .227$, $p = 0.032$) and FBS ($r = .603$, $p < 0.001$) but not with TSH ($r = -.076$, $p = 0.479$) or reticulocyte count ($r = .097$, $p = 0.361$).

Conclusion: HbA1c levels decreased and reticulocyte count increased in hypothyroid patients after 6 months of treatment. However, we cannot exclude changes in HbA1c being due to decrease in blood glucose levels.

C08

Acute Angle Closure Glaucoma in a Case of Unilateral Treated Retinopathy of Prematurity with Asymmetrical Ocular Development

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Objectives: To report a case of acute angle close glaucoma (AACG) in a unilateral treated retinopathy of prematurity (ROP) compared to the unaffected eye.

Method: Reporting of a case.

Results: A 34-year-old lady with previous history of ROP and poor vision in the left eye (OS) presented with five days history of pain and redness OS. Her OS showed evidence of AACG with presenting visual acuity (VA) of hand movement and high intraocular pressure (IOP) of 52mmHg. The anterior chamber was shallow with appositional angle closure 360 degree and thick lens. Fundus OS showed evidence of treated ROP with treatment scar up to macula. The optic disc was pale and dragged temporally. Biometry examinations revealed marked discrepancy between two eyes with axial length and lens thickness of 20.98mm and 5.20mm OS, compared to 26.03mm and 3.80mm OD. She was started on IOP lowering agents followed by lens aspiration one week after presentation. Post operatively, her IOP returns to normal and vision improved to 2/60 which was similar to her baseline vision.

Conclusion: Anatomical abnormalities in the eye of treated ROP that persist into adulthood may predispose patient to angle closure glaucoma. Unilateral cases, despite of its rarity, provide a clear cause-effect relationship of the pathology with the anatomical discrepancy between the two eyes.

C09

Drone for Medical Products Transportation in Obstetric Emergencies in Malaysia: A Systematic Review and Framework for Future Research

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Introduction: Medical products transportation has become an important research topic requiring multidisciplinary collaboration among experts in medicine, engineering and health economics. Current modes of transportation are unable to overcome the limited settings in the events of obstetrics emergency in Malaysia. The drone is an immensely promising air medical products transportation (MedART) that holds an enormous potential for delivery of medical supplies, thereby enhancing the efficiency of our healthcare system.

Objectives: Our study was conducted to provide a framework for future research by determining the problems in the current mode of medical products transportation, including ground (MedGRT), and air transportation (MedART).

Method: A literature search was conducted through the ScienceDirect, Pubmed, and EMBASE databases using the search terms related to drones, obstetrics, and blood. Original researches, reviews, meta-analyses and case studies published between 2009 and May 2019 were included. Additional relevant papers were retrieved from the list of references.

Results: The problems of MedGRT and MedART were categorized into time delays, the rate of accidents, geographical accessibility, hazards, and clinical outcomes. Of 245 publications, 3 met inclusion criteria and were included for our systematic syntheses. Two studies assessed drones for blood products delivery, and one study used drone to transport blood samples.

Conclusion: Globally there is still a serious lack in the number of studies analyzing mode of medical products transportation, including for obstetric emergencies in Malaysia. Further research is imperatively warranted in order to provide a firm baseline on which to build future studies to improve the current situation.

C10

Comparison between using Rapid *Streptococcal* Antigen Test or Throat Culture in the Diagnosis of Group A *Streptococcal* Pharyngitis in Children Presented with Sore Throat.

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Introduction: Group A *Streptococcal* pharyngitis or strep throat, is known to cause complication such as acute rheumatic fever and acute glomerulonephritis. Using conventional throat culture is time-consuming with delays in getting the final result to assist management. Rapid *streptococcal* antigen detection (RADT) is an alternative method for diagnosis.

Objective: The objective of this study is to evaluate RADT in comparison with conventional throat swab culture.

Methods: We collected throat swab from 70 children ages 3-15 years old who presented with sore throats in Primer Clinic HUKM. RADT and throat swab culture was performed simultaneously. Cohen's Kappa was used to determine the agreement between the two methods.

Results: There was a near perfect agreement between the two methods, $\kappa=0.901$ (95% CI, 0.711 to 1.09), $p<0.001$. The prevalence of strep throat in this study was 7%. There is no correlation between fever ($p=0.579$), cough ($p=0.163$), tonsil enlargement ($p=1$), or lymph node enlargement ($p=0.29$) with positive throat culture result.

Conclusion: This study showed that clinical assessment alone is not enough to diagnose strep throat. RADT is an acceptable alternative in diagnosing strep throat.

C11

Clinical Outcome of Preoperative Physiotherapy on Postoperative Trigger Finger Release Functional Recovery

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Introduction: Trigger finger is caused by thickening of A1 pulley which restricts flexor tendon gliding. Patients with grade 3 trigger finger require surgical intervention¹. This study was conducted to determine if preoperative physiotherapy in patients with grade 3 trigger finger could improve their postoperative finger functional recovery.

Methods: In this prospective study, patients with grade 3 trigger finger receiving treatment at HTAR between January and December 2018 were selected. Patients with trigger thumb, hand deformity, neurological deficit, previous hand surgery, multiple trigger finger or joint arthritis were excluded. Patient demographic data were obtained. Patients were randomly allocated into group 1 (preoperative physiotherapy) or group 2 (no preoperative physiotherapy). All patients underwent open A1 pulley trigger finger release. Postoperative active finger flexion range of motion and QuickDASH score were measured at 2 weeks and 8 weeks follow up. Results were analyzed using SPSS.

Results: 50 patients were selected. The average age was 54 years (range 34-71). Most patients were female and had middle finger trigger finger. There was more active finger flexion at the metacarpophalangeal, proximal interphalangeal and distal interphalangeal joint in group 1 patients compared to group 2. Group 1 patients also showed a better QuickDASH score at 8th week follow up. However, both results were not statistically significant.

Discussions: Trigger finger physiotherapy regiment consists of heat therapy, massage, joint stretching and mobilization¹. Massaging reduces the tissue bulk whilst heat therapy increases blood flow and collagen extensibility to the affected finger thus reducing oedema, joint stiffness and pain¹. Stretching and joint mobilization, increases tendon translational gliding thus it increases joint motion¹. We postulate that, these factors had contributed to the enhanced postoperative trigger finger functional recovery seen in patients who underwent preoperative physiotherapy.

Conclusion: Preoperative trigger finger physiotherapy improves postoperative finger functional recovery.

C12

Utilization of Bone Mineral Density Assessment in Fragility Fractures After FLS Implementation

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Introduction: Bone mineral density (BMD) provide the best assessment of fracture risk and monitoring of osteoporosis treatment. The previous study has shown that BMD test was infrequently utilized and not correspond with an international recommendation. In this study, we compare the utilization of BMD test before and after the implementation of Fracture Liaison Services (FLS) in UKM Medical Centre, Kuala Lumpur.

Objective: To compare the utilization of BMD test before and after the implementation of FLS.

Methods: All patient with fragility fractures were identified from August 2018 to May 2019. We checked if the patients were instructed and attended their BMD appointment through the hospital computer system. We compare with the pre-FLS implementation results in 2017.

Results: A total of 220 patients (57, 25.9% Male and 163, 74.1% Female) were identified with fragility fractures. Majority of the patients sustained hip fractures (56.4%) followed by wrist fracture (12.3%), vertebral fracture (11.8%) and other upper and lower limb fracture. From this study, 120 (54.5%) of patients had their BMD tested. It was a significant increase in the percentage of BMD tested ($p < 0.05$) compared to the pre-FLS programme which was only 36 (18.6%) patients had their BMD tested.

Conclusion: FLS programme is effective in increasing utilization of BMD testing. Despite the increasing percentage of BMD, it was still not optimized as per international recommendation. More awareness needs to be done towards clinician to improve the management of osteoporotic fracture.

C13

Ocular Tilt Reaction with Internuclear Ophthalmoplegia and Multiple Cranial Nerves Palsy

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Purpose: To report a case of ocular tilt reaction (OTR) with contralateral internuclear ophthalmoplegia (INO), fifth and seventh cranial nerves palsy.

Objective: To report a clinical case

Result: A 51 year-old gentleman with underlying diabetes mellitus presented with sudden onset of double vision for 3-days. On examination his visual acuity was 6/9 bilaterally without relative afferent pupillary defect. He had right OTR with right head tilt, skew deviation with left eye hypertropia and bilateral ocular torsion (right excyclotorsion and left incyclotorsion) with nystagmus. He had also left INO with left adduction deficit and right abduction nystagmus. Ocular examination revealed evidence of proliferative diabetic retinopathy bilaterally. Two days after the initial presentation, patient developed left seventh and fifth cranial nerve palsy. Magnetic resonance imaging (MRI) showed left pontine infarction and multiple chronic lacunar infarctions. There was incidental finding of vascular loop compression on cisternal portions of left trigeminal, facial, and vestibulocochlear nerves. Antiplatelet treatment was started on top of a better diabetic control. The double vision was gradually resolved with improved clinical signs. In this case the left pontine infarction had likely affected the terminal decussated part of vestibulocochlear nerve from right VOR pathway, medial longitudinal fasciculus (MLF) and cranial nerve nuclei in the left pons.

Conclusion: OTR is commonly caused by pathology in the ipsilateral VOR pathway. In case of OTR that associated with contralateral INO and other cranial nerves palsy, pathology in the pons that contralateral to OTR should be considered. Neuroimaging study can hence be targeted to identify the possible cause.

C14

Secondary Fracture Prevention of Hip Fragility Fracture in Public University Teaching Hospital

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Introduction: Hip fracture is one of three classical sites for fragility fracture globally. Hip fracture brings significant burden, morbidity and mortality to patients and caretakers. New hip fragility increases risk of sustaining re-fracture by 3 times as compared to normal person.

Objective: To identify osteoporotic management of hip fragility fracture in Hospital Canselor Tuanku Muhriz, Kuala Lumpur.

Methods: This is prospective study and all patients with hip fragility fracture were identified from admission registry, from January 2017 to December 2017. Demographic data, surgical data and drug prescription related to osteoporosis were recorded. Patients with known malignancy, fracture following severe trauma and atypical fracture were excluded.

Results: A total of 144 patients (45, 31.3% Male and 99, 68.7% Female) were identified with hip fragility fractures. Mean age is 75.7 years and majority of patients are Chinese ethnic (95, 66.0%) followed by Malay (42, 29.2%) and Indian (7, 4.9%) ethnic. 71 patients (49.3%) sustained extra-capsular hip fracture and 73 patients (50.7%) sustained intra-capsular hip fractures. 91 patients (63.2%) were treated surgically with average number of 8 days from admission to surgery time. Within 6 months after fracture, patients were prescribed with anti-osteoporosis medication (64, 44.4% yes), bone mineral density test (29, 20.1% yes), calcium (102, 70.8% yes) and vitamin D (105, 72.9% yes).

Conclusion: The osteoporotic care gap still persists in our hospital which put patients at risk of re-fracture. Implementation of Fracture Liaison Services helps to further shorten it with multidisciplinary approach.

C15

BK Virus Nephropathy in Transplant Recipient: A Management Challenge

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Introduction: BK virus nephropathy (BKVN) has become the most common cause of morbidity and mortality in post-renal transplant patient. It has become the most important cause of allograft dysfunction and graft loss, especially with the use of new potent immunosuppressive agents.

Objective: To report a clinical case

Result: We described a case of a 49 year-old renal transplant recipient who developed BKVN 7 months post-transplant. For immunosuppression, she was put on tacrolimus, prednisolone and mycophenolate mofetil (MMF) . She developed dyspepsia due to MMF hence it was changed to myfortic. She also developed acute tubular necrosis with increasing serum creatinine level. On the 7th month post transplant BK virus was first detected by real-time polymerase chain reaction (q-PCR). she underwent another change and modification of immunosuppressant regime due to increasing viral load and worsening renal function. The myfortic was changed to everolimus and tacrolimus dose was reduced. Fortunately, 9 months after detection, the virus was cleared, with the creatinine level stabilizing and the patient is still being followed up in the transplant clinic.

Conclusion: Screening for BKV allow early detection and appropriate management in monitoring therapy response. Careful reduction of immunosuppressive agents with or without antiviral therapy is important to prevent renal graft failure or dysfunction.

E01

Do Different Geographical Landscapes Affect the Presence of *Wolbachia* in Mosquito Populations?

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Introduction: *Wolbachia* has been used as a biological control in dengue-affected countries including Malaysia because of its potential to reduce the transmission of dengue viruses. The endosymbiotic *Wolbachia* bacteria can cause a wide range of reproductive abnormalities such as cytoplasmic incompatibility in mosquitoes which enables *Wolbachia* to spread rapidly, thus enabling population replacement with the introduced *Wolbachia* strain.

Objective: We aimed to explore the presence of *Wolbachia* in wild mosquito populations in different geographical landscapes.

Methods: Mosquito samplings were conducted between February and October 2014 using Mosquito Larvae Trapping Device (MLTD), BG-Sentinel traps and Human Landing Catch (HLC) techniques in Wangsa Maju (Residential areas) and Bukit Nanas (Kuala Lumpur Forest Eco Park), both located in urban areas of Kuala Lumpur. *Wolbachia* DNA was detected by Polymerase Chain Reaction (PCR) using 16S rDNA primers.

Results: Out of 30 *Aedes albopictus* tested from Wangsa Maju, more than half of the mosquitoes were infected with *Wolbachia* of different supergroups. In contrast, *Ae. albopictus* from Bukit Nanas were found negative for *Wolbachia*. Nonetheless, another species of mosquitoes, *Armigeres subalbatus* collected from Bukit Nanas was positive for *Wolbachia*.

Conclusion: There is a strong possibility that *Wolbachia* is absent in the *Ae. albopictus* population in Bukit Nanas. Its geographical conditions (isolated, hilly and forested area) make it difficult to be accessed by transportation. This prevents migration or influx of mosquitoes from other areas making the local population free of *Wolbachia*. Furthermore, there is lack of evidence for natural *Wolbachia* transmission between different species of mosquitoes.

E03

Seroepidemiological Study of Toxoplasmosis among Patients with Schizophrenia Spectrum Disorders in Kuala Lumpur

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Introduction: Toxoplasmosis in neuropsychiatric patients has been a leading issue lately. In chronic stage, *Toxoplasma gondii* encysted in multiple organs including the brain which may alter neurological functioning. However, there is limited information about the seroepidemiology of *T. gondii* infection in psychiatric patients in Malaysia.

Objective: This study aimed to determine the seroprevalence of toxoplasmosis and socio-demographic profiles in schizophrenia patients and psychiatrically healthy individuals.

Methods: This case-control study recruited 114 schizophrenia spectrum disorders patients from Hospital Canselor Tunku Muhriz UKM, Kuala Lumpur and 114 healthy subjects. They were screened for IgG and IgM antibodies against *T. gondii* by indirect ELISA method. Socio-demographic data were obtained and analysed using descriptive statistics.

Results: Seroprevalence of anti-*Toxoplasma* IgG antibodies in patients with schizophrenia spectrum disorders (24.6% [95%CI 32.3-16.1]) was lower than in the control subjects (30.7% [95%CI 39.7-22.2]) ($p=0.375$). Whereas, anti-*Toxoplasma* IgM antibodies were negative in all samples. Seroprevalence of toxoplasmosis significantly differs between groups for race, age group, education level, occupation, marital status, and family history of psychiatric illness ($p<0.001$). However, there was no significant difference for both seropositivity and serointensity of anti-*Toxoplasma* IgG antibody between the two groups. Similarly, within cases group, statistical analysis did not reveal any significant difference between demographic variables and *T. gondii* exposure ($p>0.05$).

Conclusion: This study is essential to establish the sociodemographic profile of toxoplasmosis among patients with schizophrenia spectrum disorders in Malaysia. The lower seroprevalence of *T. gondii* in patients possibly due to the enrolled patients were clinically stable, comprising a relatively homogenous sample.

E04

Cysticidal Effect of Disinfectants Used in Operating Theatres of Hospital Canselor Tunku Muhriz Against *Acanthamoeba* Cysts

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Introduction: *Acanthamoeba* spp. is the causative agent for *Acanthamoeba* keratitis and granulomatous amoebic encephalitis. The cyst stage of this amoeba is also known to harbor potentially pathogenic bacteria such as *Legionella pneumophila* and *Mycobacterium* spp. and protect them from harsh environment and some antimicrobial agent.

Objective: This study was conducted to evaluate the efficacy of disinfectants used in Hospital Canselor Tunku Muhriz (HCTM) operating theatres against *Acanthamoeba* spp. and to determine their minimal cysticidal concentration (MCC).

Methods: Germisep, Dichlosep and Anioxyde were used against eight strains of *Acanthamoeba* spp. The MCC was achieved by double dilution process of the working concentration for each disinfectant. 100 µl cysts suspension standardized at 10⁵cysts/ml was pipetted into each well, incubated at 30°C, washed using Page amoebic saline and cultured on non-nutrient agar overlaid with heat-killed *Escherichia coli*. The presence of trophozoite was observed daily for 14 days; and the lowest concentration able to prevent trophozoites formation was noted as the MCC.

Results: The working concentration of Dichlosep (140 ppm) and Anioxyde (1500 ppm) were effective in killing all strains of *Acanthamoeba*. However, the working concentration of Germisep (150 ppm) was ineffective against five strains. The mean MCC for Germisep, Anioxyde and Dichlosep were 244.14±97.38 ppm, 246.10 ±206.23 ppm and 140 ppm respectively.

Conclusion: A review on the protocol of utilization of Germisep in UKMMC operating theatres is warranted in order to prevent infections by *Acanthameoba* and its bacterial endosymbiont.

E06

The Preliminary Study of Detection Parasitic Lung Infection using Bronchoalveolar Lavage Sample in Malaysia

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Introduction: Respiratory symptoms are one of the commonest symptoms in human pathology. In Malaysia, pneumonia was the national second cause of death, especially among the urban population. The pneumonia pathogen could be viral, bacterial, fungal or parasite. Generally, parasitic infection is common in Malaysia and some parasites are even endemic. Parasitic lung infection occurs worldwide and frequently seen in tropical regions. It may infect immunocompromised and immunocompetent individuals.

Objective: This study was conducted to determine the prevalence of parasitic lung infection using bronchoalveolar lavage sample and its association with sociodemographic and clinical presentation data.

Methods: A cross-sectional study was conducted in a tertiary hospital in Kuala Lumpur and 100 fresh bronchoalveolar lavage samples were collected from patients who underwent bronchoscopy procedure via universal sampling. Samples were processed for parasitological staining and examined under the microscope. Data on sociodemographic and clinical presentation of all patients was collected through medical record.

Results: As the preliminary results, the prevalence of parasitic lung infection from the bronchoalveolar lavage samples was 7%. The study revealed the presence of *Lophomonas blattarum* and *Trichomonas* sp. in samples collected. A significant association was observed between diarrhoea symptom with the prevalence of parasitic lung infection ($p=0.0123$). The study also showed parasitic lung infection was significantly more prevalent in immunocompromised individual compared to immunocompetent ($p=0.0206$).

Conclusion: Parasitic lung infection in Malaysia is underdiagnosed. Individuals with diarrhoea symptom should be screened for parasite examination especially in the immunocompromised group.

E07

Evaluating the Usability of Expired DNA Ladder in Medical Application

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Introduction: Conventional Polymerase Chain Reaction (PCR) is an important molecular technique in pharmacogenetic testing. However, DNA ladder is expensive and its shelf life is relatively short, expiring in two years from the manufacturing date. Thus, it is important to evaluate the quality and usability of DNA ladder 2 years post expiry date.

Objective: To evaluate the usability and sharpness of expired DNA ladder in agarose gel.

Methods: Hundred base-pair DNA ladder (0.5 ug/uL) from two commercial sources (A: ThermoScientific GENE ruler and B: Biomax Scientific cDNA ladder) were evaluated using 1.0%, 1.5% and 2.0% agarose gel run in Tris Borate EDTA (TBE) buffer, at 70V for 60 minutes. Both DNA ladder had expired for 2 years. In a separate experiment, 6ul (3 ug), 5ul (2.5 ug), 4ul (2 ug), and 3ul (1.5 ug) of DNA ladder (concentration) were run in 2.0% agarose gel, the sharpness of DNA bands were evaluated. SYBR safe DNA gel stain was used as nucleic acid stain. The resulting DNA-dye-complex absorbs blue light at 509nm and emits green light at 524nm.

Results: Both DNA ladder A and B appeared wavy at 2% and 1% agarose gels, while sharpest in 1.5% agarose gel. The use of 5ul and 6ul DNA ladder had the sharpest bands down the 100bp marker compared to 4ul and 3ul DNA ladder.

Conclusion: Expired DNA ladders A and B are best used at 1.5 % agarose gel. A minimum of 5ul (2.5 ug) DNA ladder per well is recommended for sharp and clear bands.

E08

Optimization of Culture Condition for Clinical-Scale Expansion of Wharton's Jelly Mesenchymal Stem Cells

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Introduction: Mesenchymal stem cells (MSCs) can be isolated from many different tissue sources, including Wharton's jelly of the umbilical cord. Wharton's jelly MSCs (WJ-MSCs) are abundant, easy to isolate and have multilineage differentiation potential and immunosuppressive property. Due to these advantages, WJ-MSCs have huge clinical potential for the treatment of a myriad of diseases. For treatment purposes, WJ-MSCs need to be expanded in large-scale to meet the huge cell number needed per patient.

Objective: This study was conducted to optimize the WJ-MSC culture condition for large-scale expansion of WJ-MSCs for clinical applications.

Methods: WJ-MSCs were seeded at density 5000 cells/cm² in 6-well plate and cultured with the DMEM-LG medium+10% FBS, DMEM-LG medium+10% hPL, MesenCult™-hPL medium, MesenCult™-ACF plus medium, StemMACS™ medium and MSC-Brew GMP medium. The cells morphology and growth kinetic were compared. Afterwards, WJ-MSCs were seeded in 6-well plate at density 1000 to 5000 cells/cm². Again, the cell growth kinetic was analyzed.

Results: Morphologically, WJ-MSCs cultured with the DMEM-LG medium+10% hPL, StemMACS™ medium and MSC-Brew GMP medium were smaller in size. Cell yield was significantly higher and population doubling time was significantly shorter when using the DMEM-LG medium+10% hPL, StemMACS™ medium and MSC-Brew GMP medium. StemMACS™ medium and MSC-Brew GMP medium gave high cell yield only at seeding density 5000 cells/cm² and 3000 cells/cm² while DMEM-LG medium+10% hPL gave high cell yield for all seeding density.

Conclusion: DMEM-LG medium+10% hPL, StemMACS™ medium and MSC-Brew GMP medium are suitable for clinical-scale expansion of WJ-MSCs. However, DMEM-LG medium+10% hPL is the best medium as it can provide higher cell yield at lower passage as it support cell proliferation at low cell seeding density.

E09

Prevalence of Microsporidiasis among Malay School Children in Besut, Terengganu

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Introduction: Microsporidia are single-celled intracellular parasite which causes an emerging opportunistic infection associated with a wide range of clinical syndromes in humans. Most studies of this parasite focus on the immunocompromised patients. Thus, there is a lack of information on microsporidiasis in healthy people (immunocompetent) worldwide.

Objective: This study was conducted to determine the prevalence and risk factors associated with intestinal microsporidiasis among Malay school children in Besut District, Terengganu, Malaysia.

Methods: Stool samples were collected from 139 school children (age 9-11 years old) after consent were given by their parents. Samples were stained with Gram-chromotrope Kinyoun and examined microscopically to detect the spores. Demographic, socioeconomic, environmental and personal hygiene information using a pre-tested questionnaire were also completed.

Results: Fifty-two of the children (37.4%) was positive for microsporidia: 63.4%, 3.84% and 32.7% were low (1+), moderate (2+) and severe (3+) excretions of microsporidia spores respectively. Univariate and multivariate analyses showed being male ($p=0.026$), bathing in warm spring nearby ($p=0.014$), drinking pipe water ($p=0.012$) and living in lower household income ($p=0.001$) were all significantly associated with microsporidia infection among study subjects.

Conclusion: Microsporidiasis has never been reported in Malay school children. Our findings suggest intestinal microsporidiasis is common in the study population and control measures need to be implemented. Future research need to investigate the source of the infection and accurate identification of microsporidian species by molecular technique since this will determine the best treatment for the study population.

E11

Molecular Identification of *Chrysomya megacephala* using Loop-mediated Isothermal Amplification (LAMP)

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Introduction: Forensic entomology is the science of analysing insect evidence, particularly fly species, to aid in death investigation. However, the routine identification process of fly species using microscopic examination is laborious and time-consuming. Loop-mediated isothermal amplification (LAMP) is a simple method that can amplify DNA with high specificity, sensitivity and rapidity.

Objectives: This study compared the performance of a recently developed LAMP assay with a conventional PCR method for species identification of *Ch. megacephala*.

Methods: A total of 30 third instar larvae of *Ch. megacephala* species were collected from a rabbit carcass. DNA from the larvae were extracted, followed by PCR and LAMP techniques. Four primers specific for this fly species were designed corresponding to Gr1 gene sequences. The specificity of the LAMP assay was determined using DNA samples from eight other forensically-important fly species.

Results: Out of 38 *Ch. megacephala* larvae samples, only 24 were PCR positive with sensitivity and specificity of 80% and 100% respectively. Meanwhile, all samples (38/38) were successfully amplified by LAMP technique with sensitivity and specificity of 100% respectively. In addition, the detection limit of the LAMP technique was 1×10^{-6} ng/ μ l compared to PCR, which can only detect at 1×10^{-1} ng/ μ l of DNA template.

Conclusion: To the best of our knowledge, this is the first study using LAMP technique in the field of forensic entomology. These current findings showed that LAMP technique can be adapted to ease fly species identification.

E12

A Meta-analysis on the Association between *XRCC3* Thr241Met Polymorphism and Glioma Risk

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Introduction: Defective DNA repair is a common hallmark of all malignancies, including gliomas. The *XRCC3* gene encodes a critical protein in the DNA repair pathway. Genetic polymorphisms in *XRCC3* may affect the DNA repair capability of the protein and may represent a risk factor for glioma. One such polymorphism causes a Thr-to-Met substitution in the residue 241 of the protein product. Over the years, numerous studies have investigated the association between this Thr241Met polymorphism and glioma risk, but the findings are inconsistent.

Objective: In this work, we aimed to obtain a precise estimate of the association between *XRCC3* Thr241Met polymorphism and glioma risk via a meta-analysis.

Methods: A comprehensive literature search was conducted on major databases. Odds ratio (OR) and 95% confidence intervals (CI) were calculated under five genetic models (homozygous model, Met/Met vs. Thr/Thr; heterozygous model, Thr/Met vs. Thr/Thr; dominant model, Met/Met + Thr/Met vs. Thr/Thr; recessive, Met/Met vs. Thr/Met + Thr/Thr; allele, Met vs. Thr).

Results: A total of 11 studies involving 4,527 cases and 5,591 controls were included for analysis. Under homozygous model, the *XRCC3* Thr241Met polymorphism was associated with an increased glioma risk at borderline significance (OR=1.33, 95% CI=1.00-1.75, P=0.05). Nonetheless, significant association was not observed under all other genetic models (heterozygous model: OR=1.05, 95% CI=0.89-1.24, P=0.59; dominant model: OR=1.08, 95% CI=0.91-1.29, P=0.36; recessive model: OR=1.27, 95% CI=0.99-1.65, P=0.06; allele model: OR=1.09, 95% CI=0.94-1.26, P=0.25).

Conclusion: Based on current evidence, the *XRCC3* Thr241Met polymorphism is not likely to be associated with glioma risk.

E13

The Areas of Information Published on RCT for Nutrition for Children with Autism Spectrum Disorder: A Systematic Review

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Background: Autism spectrum disorder (ASD) is a complex neurodevelopment disability characterized by impaired social interactions, communications and several neurobehavioral symptoms. The behavioural issues, as an example of food behaviour, commonly resulted in higher risk of low nutritional status. The aim of this review was to explore the areas of information published on nutrition and autism.

Methods: A keyword search was conducted using the online database PubMed and Ovid Medline from year 1946 to February 2018. Inclusion criteria were 1) randomized controlled trials that enrolled 2) human subjects 3) age from birth to 18 years old with ASDs and 4) reported at least one outcome measure that addresses the core symptoms of ASDs. All paper were written in English as language.

Results: This systematic search yielded a total of 105 published empirical papers. Only 13 papers met the inclusion criteria. The areas published are supplementation, modified diet and behavioral intervention that relate to food behaviors contributed to the improvement of the children nutritional status and their ASD symptoms.

Conclusion: There were limited areas on nutrition for children with ASD published in the journals focusing on RCT. It is important to have more areas published in the field of nutrition for ASD to provide more evidence-based information to the health practitioners and public.

E14

High-abundant Protein Depletion in Serum using Thermo Scientific™ Pierce™ Top 12 Abundant Protein Depletion Spin Columns

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Introduction: Serum samples are widely-used for proteomic-based biomarker discovery. However, serum proteomics is complicated by its sheer complexity and wide dynamic range. Antibodies-based methods for depleting high-abundant proteins is popular for selectively capturing and removing these high-abundant proteins.

Objective: To determine and compare the efficiencies of immunodepletion of high-abundant serum protein using SDS-PAGE.

Methods: For immunodepletion, 10 L of serum samples were added directly onto the resin in column provided in the Thermo Scientific™ Pierce™ Top 12 Abundant Protein Depletion Spin Columns kit. The mixtures of serum and resin were incubated for 60 minutes before centrifuged for 2 minutes. The flow through was collected and run with SDS-PAGE (Resolving gel 10%, Stacking gel 5%) at 180 V for 60 minutes prior to staining with Coomassie solution overnight at room temperature. Protein bands were visualized under ChemiDoc™ MP Imaging System. Non-depleted sera were used as negative controls.

Results: A marked reduction of band intensities at ~65 kDa (albumin), ~53 kDa (IgG heavy chain) and ~29 kDa (IgG light chain) from depleted serum was observed relative to the negative controls. However, a trace was visible at ~65 kDa, suggesting incomplete removal of albumin.

Conclusion: The immunodepletion kit used in this study was efficient to remove most of the high-abundant protein (albumin), but our findings were not able to reproduce the total depletion of albumin as per claimed by the manufacturer.

E15

Identification of the Substrates for Ubiquitin E3 Ligase- SCF^{bTrCP} using Affinity Purification - Mass Spectrometry

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Introduction: SCF^{bTrCP} ubiquitinates proteins that are involved in cell cycle, DNA damage and cancer progression, leading to their proteasomal degradation. Substrate recognition is achieved by the bTrCP (FBXW11) subunit, a F-box protein via a phosphodegron containing the DSpGXX(X)pS motif.

Objective: To determine candidate substrates that interact with FBXW11 and harbor the DSpGXX(X)pS motif.

Methods: A FBXW11 construct was designed to contain 2 x FLAG and 2 x HA tags at its N-terminals and transfected into HEK293T cells. Cells were grown up to 90% confluence and lysed. Immunoprecipitation was performed in a tandem affinity purification (TAP-tag) manner. Immunoprecipitated proteins were identified using mass spectrometry.

Results: The AP-MS experiments generated 224 reliable and high confident protein identifications. Among these proteins are PER2, REST, CDC25A, CTNNB1 and WEE1. These 5 selected proteins are well-established substrates for SCF^{bTrCP}. We are in the process of validating other highly confident hits.

Conclusion: By combining affinity purification and mass spectrometry, we managed to identify 224 genuine protein interactors for FBXW11. Among these 224 proteins, 5 of them are well-established substrates for SCF^{bTrCP} ubiquitinates. This preliminary result validates our method for a potential screen for the substrates of SCF^{bTrCP}.

E16

Development of Maldi Imaging Protocol for Cancer Biomarker Discovery Study

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Introduction: MALDI imaging is a mass spectrometry technique for characterizing the composition, spatial distribution and relative abundance of endogenous biomolecules across a tissue section. It has been applied in numerous field of study and has become a powerful technique for identification of biomarkers. Sample preparation is critical to the success of MALDI imaging analysis, but until now there is no consensus on a standardized protocol for analysis.

Objective: We aim to optimize the sample preparation steps for studying protein molecules in cancer tissues using MALDI imaging to obtain high quality and reliable data.

Methods: We evaluated several parameters of the MALDI imaging workflow, including tissue thickness, sample treatment and data acquisition parameters for profiling spatial distribution of proteins in tissue sections. Mass spectra data was normalized by total ion count and differences in ion intensities between different parameters were compared.

Results: Each parameter was found to affect the ionization efficiency and MALDI imaging results. Higher spectral intensities were observed when tissue thickness of 10 μ m was used for analysis. The washing step further enhanced protein detection with both Carnoy's and ethanol wash procedures produced comparable spectrum quality. The optimal instrument settings such as laser shots per raster spot and spatial resolution were also determined.

Conclusion: Our work has successfully optimized the tissue preparation and data acquisition protocols for protein analysis in cancer tissues using MALDI imaging and demonstrate the potential of the technique to dissect molecular alterations underlying disease pathogenesis.

E17

Overcoming the Bioinformatics Barrier in Microbial 16S rRNA Targeted Sequencing for Pathogen Identification in the Clinical Microbiology Laboratory

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Introduction: Recently, 16S rRNA targeted sequencing has been proposed for pathogen identification in the clinical microbiology laboratory. Nevertheless, this technique requires bioinformatics expertise. We investigated the utility of the B.E. Patho, a “plug-and-play” bioinformatics suite developed by Bioeasy Sdn. Bhd., for rapid analysis of 16S targeted sequencing reads for pathogen identification.

Methods: Six known bacteria samples (*Staphylococcus aureus*, *Escherichia coli*, *Haemophilus influenzae*, *Acinetobacter sp.*, *Burkholderia pseudomallei*, *Mycobacterium tuberculosis*) were subjected to 16S rRNA targeted sequencing using the Illumina Miseq platform. Raw sequencing data were uploaded without any further manipulation onto the B.E. Patho suite prior to being installed in a workstation. A notification of completion is then emailed to user-registered email once analyses were completed.

Results: A total of 12.11 million sequencing reads with sufficient depth was generated. The results, in the form of an automated report, was generated by the B.E. Patho suite in approximately 6 hours and 20 minutes. Bioinformatics skills was not a prerequisite to run the analysis. All samples were accurately classified to the genus level except for *E. coli*, which was identified as the *Klebsiella* genus. However, species identification was only highly accurate for *S. aureus* (96.9%).

Conclusion: The B.E. Patho suite was found to be a user-friendly bioinformatics suite to identify pathogen genus via 16S rRNA targeted sequencing. However, for bacteria species not differentiable via the 16S rRNA gene sequence, such as *H. influenzae*, *Acinetobacter sp.*, *B. pseudomallei* and *M. tuberculosis*, alternative target genes should be used for differentiation.

E19

Size Matters: Methicillin-resistant *Staphylococcus aureus* (MRSA) Colony Size Affects Infection Persistence and Host Survival in a *Caenorhabditis elegans* Model

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Introduction: Methicillin-resistant *Staphylococcus aureus* (MRSA) are able to generate pin-point colonies (the small colony variant, SCV) reported to cause persistent infections. This study was carried out to investigate MRSA colony size as the determinant of persistent infection and host survival in a *Caenorhabditis elegans* model.

Methods: Tested strains O1, OV, OVR, O1-VR, OV-VR, OVR-VR were fed to *C. elegans* strain N2. Surviving worms were enumerated in a 5-day liquid medium survival assay. O1 and O1-VR were SCVs, the rest were normal-sized colonies. O1 was a clinical MRSA isolated from Tokyo, Japan; the other strains were laboratory mutants. Killing effect of the tested bacteria on N2 was further evaluated using a 14-day agar medium survival assay. In addition, MRSA strains isolated from Hospital Canselor Tunku Muhriz (HCTM) designated as 261, 332, 377 and 775 were also fed to N2 and subjected to the 14-day agar-based survival assay. All HCTM MRSA were normal-sized colonies. Worm survival (%) during experiments was plotted against time (day) in Kaplan-Meier plots.

Results: All normal-sized colonies showed faster killing of worms (>70% killed during three days of the assays). This was consistent regardless of assay medium and background of tested strain. Interestingly, worms fed with SCV MRSA O1 and O1-VR did not die rapidly from the infection. At the end of the assays, surviving worms were still observed for those fed with O1 and O1-VR.

Conclusion: MRSA colony size might be an important factor in determining host survival or infection persistence.

E20

A Fitter Bacteria in Hospital Canselor Tunku Muhriz (HCTM) UKM: Phenotype Changes between Methicillin-resistant *Staphylococcus aureus* (MRSA) Isolated in the Years of 2009 and 2017

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Introduction: We previously reported evidence of methicillin-resistant *Staphylococcus aureus* (MRSA) clonal replacement that occurred in Hospital Canselor Tunku Muhriz (HCTM) UKM in the years of 2009 and 2017. The dominant genotype of SCC*mec* type III-SCC*mercury* with *ccrC* in 2009 was found to be replaced with SCC*mec* type IV in 2017. This study was carried out to determine the biological effect of this clonal replacement.

Methods: Representative MRSA strains (four each) of SCC*mec* type III-SCC*mercury* with *ccrC* and SCC*mec* type IV were subjected to fitness experiments. Independent growth curves for tested strains were determined via time needed to reach exponential growth after 4 hours of incubation from a sub-inoculum of overnight culture. The strains' survival to desiccation in 24 and 48 hours were determined.

Results: The SCC*mec* type IV MRSA strains reached exponential growth more rapidly compared to SCC*mec* type III-SCC*mercury* with *ccrC* strains. Interestingly, the SCC*mec* type IV MRSA strains were also consistently more resistant to drying, compared to the SCC*mec* type III-SCC*mercury* with *ccrC* genotype.

Conclusion: Phenotype changes was observed between MRSA isolated from the year 2009 and 2017. The current HCTM MRSA grows faster and is more resistant to desiccation, making it a fitter pathogen. It remains to be determined if this change in MRSA fitness translates into poorer clinical outcome in HCTM patients.

Malaysian Anatomical Association Conference

*'Paradigm of Translational
Research in Anatomy'*

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Marina Putrajaya

KEYNOTE ABSTRACT

Anatomists in Translational Research: Past, Present & Future

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Translational research or translational medicine, simply said is 'bench to bedside' research targeted towards improving the health of the general population. This presentation will take you through a journey that started with Herophilus, the Father of Anatomy to Vesalius (often regarded as the Father of Modern Anatomy) to Thomas Willis, famed for the "Circle of Willis" and acknowledged as a pioneer in translational research. Many academic anatomists today are not only involved in basic science research that has a translational slant, but also, in the training of young scientists. A proficient knowledge of human anatomy provides early career translational researchers with the necessary foundation for a better understanding of pathophysiology, thus enabling high quality pathogenesis-oriented research. The translational research paradigm comprises of 4 stages from the preclinical stage to ultimate translation. However, there are challenges faced such as creating and nurturing collaborative research environments, and having effective training programmes in place. So what is on the horizon? It is likely that translational research is not just a flavour of this era but here to stay. This brings to mind, the painting of Venetian artist Titian, entitled "Allegory of Prudence", which depicts the heads of an old man, an adult and a youth, and has an inscription that reads "from the past /the present acts prudently/lest it spoil future action". Hence, the role of future anatomists in translational research will be shaped by the collective stance adopted by the Anatomy community of the present.

Keywords: Basic science, bench to bedside, pathophysiology, multidisciplinary research, knowledge, human anatomy

PLENARY 1

Role of Osteology in Translational Research

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To identify human remains is the basic humanitarian, legal and natural rights of every human. The methods are classified into non-scientific and scientific. Even though DNA is the most precise identification, in many cases, the DNA is degraded. Consequently, in Thailand, we now developed a method of human genomic extraction from bone using gelatine-coated magnetic particles. Bone remains when found, 4 principles of identification are applied: sex, age, stature and ancestry. The most significant one is sex since it could promote the other principles. Sexual dimorphism in many bones was studied in Thais. Yet, the most challenging principle is age estimation which has only some studies in Thais. Furthermore, stature identification is very important and was studied in both complete and incomplete long bones. Lastly, ancestry study is still in progress with collaboration of Thai-Japan.

Keywords: Osteology, forensic, medicolegal

PLENARY 2

In Vitro Culture as a Basis of Translational Research

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Translational research is the two-way process of applying the knowledge from basic research findings to the clinical level. Basic science studies are often performed on cellular, tissue or animal model to investigate the mechanism of the underlying disease or in analysing and developing an agent with therapeutic potentials. In vitro culture system in a precisely controlled physio-chemical environment provides physical and visual access to individual species-specific cells. Using the in vitro culture system, the phenotypic characteristics and proliferative capacity of corneal and conjunctival cells were analysed. Studies involving in vitro culture of corneal cells supplemented with local honey and edible bird's nest (EBN) were further explored. The wound healing effects of edible bird's nest (EBN) and Acacia honey on corneal cells were demonstrated in vitro. The favourable effects of EBN in vivo were elucidated using heptanol induced rabbit corneal de-epithelialization model. The in vitro culture system was further explored by using human chondrocytes isolated from human osteoarthritic articular cartilage. The chondroprotective effects of these cells were evident by adding an aqueous extract of marine sea cucumber in the culture system. Hence, these studies represent a proof of concept for biological and therapeutic potential of natural products onto specific cells utilizing the in vitro culture system.

Keywords: Corneal cells, conjunctival cells, edible bird's nest, acacia honey, human chondrocytes

SYMPOSIUM 1 (CELL BIOLOGY)

Chondrocyte for Cartilage Repair: An Insight in Translational Animal Models

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Osteoarthritis is a long-term chronic disease characterised by the deterioration of the articular cartilage layer in joints. Other than the ageing factor, osteoarthritis is also associated with various modifiable and non-modifiable risk factors. Articular cartilage is a simple tissue, which is represented by only one cell type, i.e. chondrocyte. Although the understanding of factors regulating the development, degeneration and regeneration of cartilage has increased, a dedicated method to produce neocartilage that would be equivalent to the original healthy tissue, is still lacking. Animal studies are essential to evaluate effective treatments for cartilage injuries *in vivo*. Animals commonly used in cartilage repair studies include small and big animals. Apart from low-cost strategy, small animals are simple to house and useful for pilot or proof of concept studies. However, small joint size and thin cartilage restrict the translational value of small animal models. These animals have more significant potential for natural healing than humans. Big animal models with thicker articular cartilage allow the study of both partial and full-thickness cartilage repair. Nonetheless, knee joint size and cartilage thickness remain significantly smaller than that of humans. As an alternative, the study can be done in a larger animal model, e.g. equine. Although larger animals may have more resemblance to the actual clinical situation, they pose more significant ethical considerations as well as financial and logistic issues. This paper presents some ongoing attempts in understanding certain aspects of cartilage tissue engineering using animal models. Since an ideal formulation to regenerate reliable cartilage has yet to be resolved, translational animal models are still needed for cartilage repair studies. The overall aim of pre-clinical research is critical in determining an appropriate animal model. The question is whether the answer would come from the methods to use or not to use animal models for cartilage repair studies.

Keywords: Chondrocytes, cartilage, tissue engineering, regenerative medicine, translational research, animal models

SYMPOSIUM 2 (NEUROANATOMY)

Therapeutic Potential of Prefrontal Cortical Stimulation for Depression and Dementia

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Introduction: Major depression and dementia pose major health challenges, worldwide. Despite enormous efforts have been made to search for a cure in depression and dementia, majority of these studies have failed. In this study, we investigated the potential roles of deep brain stimulation (DBS) for antidepressant and memory enhancement in animal models.

Materials and Methods: The animals were stimulated in the medial prefrontal cortex (mPFC), and they were behaviourally tested for depressive-like and hippocampal-dependent memory tests. For mechanisms, we investigated the hippocampal neuroplasticity and midbrain monoaminergic signalling using a combination of microarray, biochemical, immunohistochemical, and electrophysiological approaches.

Results and Discussion: Our results demonstrated that DBS of the mPFC enhanced antidepressant-like activities and memory functions in rat models of stress-induced depression and aged-related cognitive impairment, respectively. Interestingly, we showed that mPFC DBS evoked the neurocircuitry pathway of depression that related to the midbrain monoaminergic system. We also revealed that mPFC DBS rescued the stress-induced dopaminergic neurodegeneration in the midbrain of animal model with vulnerability to stress-induced depression. For hippocampal-related mechanisms, there were significant increase of neurogenesis and dendritic arborisation in stimulated animals when compared to sham-control. Finally, our microarray study showed changes in distinct pattern of gene expression with G-protein-coupled receptor pathways, suggesting the roles of neuroplasticity-dependent and -independent effects of DBS.

Conclusion: Although we found significant antidepressant-like and memory enhancement by mPFC DBS, additional studies are needed to investigate the effects of DBS that look beyond neurogenesis and other pathways suggested by our findings.

Keywords: Dementia, depression, neuroplasticity, memory enhancement, antidepressant

SYMPOSIUM 3 (ANATOMY EDUCATION)

Reimagining Anatomy Education

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Anatomy educators have recognized the needs to innovate, creating new visions and new measures to revitalize the anatomy education ecosystem within the continually changing medical curriculum. Many innovations in anatomy are technology-driven and aligned with digitalization era of the fourth industrial revolution. Nevertheless, it is debated whether these innovations are effective in addressing issues related to declining anatomy knowledge among medical graduates. Since adequate anatomy knowledge is required for safe clinical practice, it is pertinent for anatomy educators to get involved in anatomy education research and anatomy curriculum planning. There are four related components of anatomy curriculum that can be explored, which include: (i) education environment; (ii) syllabus; (iii) teaching methodology; and (iv) assessment. Measuring anatomy education environment is pivotal prior to any program evaluation and change as it provides valuable input on elements that affect students' learning. To streamline anatomy syllabus, a concerted effort among anatomists at the national level should be achieved in identifying core topics and their learning outcomes that can promote adequate acquisition of knowledge, skill, and value prior to clinical training. Teaching methodology should move beyond technology-enhanced innovations by utilizing educational theories into its theoretical framework and integrating its instructional material. Besides, a holistic anatomy assessment is crucial to ensure its validity in assessing higher order thinking skill, psychomotor skill, and professional behaviours. An organized scenario and strategic planning conducted at the national level would be advantageous to produce the anatomy curriculum, which by design is effective and relevant within and beyond the fourth industrial revolution.

Keywords: Curriculum, design, anatomy education, syllabus, teaching, methodology

ORAL PRESENTATIONS

O11: Determination of Body Height Identification Based on Fingers Length (Digiti Manus) In Bataknese

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Introduction: Various incidents can cause unrecognized and separated limb pieces, such as disasters and mass damage. In accidents where the victims cannot be identified because of severe damage and few founded pieces, the estimated height can be done by measuring a certain part of body. The regression formula using the length of index fingers, age and sex has been a valid estimation of the height and useful in clinical context. The aim of this study was to determine the relation of index finger, middle finger, and ring finger length to stature from Bataknese at the Faculty of Medicine, Universitas Muhammadiyah Sumatera Utara (UMSU).

Materials and Methods: The design of this study was descriptive correlative with cross-sectional design. The study population comprised 63 individuals including Bataknese students, permanent lecturers, and staffs at the Faculty of Medicine UMSU who matched the inclusion and exclusion criteria. The sampling technique was total sampling method. The length of the index finger, middle finger and ring finger was obtained by measuring the distance from the proximal (metacarpophalangeal joint) phalanges to the phalanges distal using instrument sliding calliper.

Results and Discussion: Finger length was significantly correlated to stature with coefficient correlation ranging from 0.611 to 0.681 ($p < 0,001$) for index finger, from 0.780 to 0.939 ($p < 0.001$) for middle finger, and 0.619 to 0.858 ($p < 0,001$) for ring finger. Linear regression equations showed Standard Error of the Estimate (SEE) ranging from 2.883 to 3.3839 ($p < 0.001$) for index finger, 1.714 to 3.528 ($p < 0.001$) for middle finger, and 2.918 to 3.788 ($p < 0.001$) for ring finger.

Conclusion: There was significant relation of index finger, middle finger, and ring finger length to the height of the Bataknese with strong correlation thus height for Bataknese can be estimated by measuring the length of the index finger middle finger and ring finger through a linear regression formulation.

Keywords: Finger, length, stature, linear regression equation, anthropometry

O12: Discriminant Function Analysis for Sex Determination of 3D Glenoid Cavity Model in the Malaysian Population

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Introduction: Sex determination of incomplete skeletal remains by discriminant function analysis is frequently used in forensic sciences. Glenoid cavity that is usually spared from taphonomic processes had been studied for its potential in differentiating sex in other population. This study aimed to investigate sexual dimorphism of the glenoid cavity and to evaluate the classification accuracy of discriminant functions of the glenoid cavity in determining sex in the Malaysian population.

Materials and Methods: About 310 models of three-dimensional (3D) glenoid cavity were used in this study. The models were randomly divided into two groups that comprised training (n = 250) and holdout (n = 60) groups. Two measurements were taken i.e. glenoid cavity length (GCL) and breadth (GCB). Independent t-test and discriminant function analysis were performed on the training group while the holdout group was analysed for validation of the discriminant functions.

Results and Discussion: Both measurements showed a significant difference between sexes ($p < 0.001$). Univariate discriminant functions (DF) were established with GCB displaying the highest classification accuracy (90.8%) compared to GCL (80.8%). Multivariate DF of both measurements showed 90.8% accuracy. Validation of the DFs using holdout group showed multivariate DF exhibiting the highest classification accuracy (86.7%) compared to univariate DFs (78.3% - 85%).

Conclusion: Briefly, the 3D glenoid cavity models were sexually dimorphic, and the discriminant functions were accurate in determining the sex of an unknown glenoid cavity, particularly when the traditionally used sexually dimorphic bone were unavailable.

Keywords: Glenoid cavity, sexually dimorphic, computed tomography, discriminant functions

O13: Stature Estimation from Long Bone Measurements using Compute Tomography Scan in the Malaysian Population

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Introduction: Stature is one of the important biological profiles in human identification process of skeletonised remains, particularly when unidentified remains are found. In Malaysia, studies on stature estimation were conducted in a small sample size, and the results were insufficient to be used for practical purposes in forensic. Hence, population-specific regression equations were developed from long bone measurements for stature estimation for the Malaysian population.

Materials and Methods: In this study, 3219 samples comprising upper limbs (humerus, radius and ulna) and lower limbs (femur, tibia and fibula) were retrieved from PMCT Scan data. The samples belonged to cases autopsied from January 2012 till March 2018. Maximum length of long bones was virtually measured by OsiriX MD V.8.5 software. Statistical analyses (Statistical Package for Social Sciences (SPSS), version 24) were performed to examine correlations between stature and bone lengths, and to investigate differences in stature between sexes, age groups and bilateral sides.

Results and Discussion: Results showed good correlations between stature and maximum length of bones. Single linear regression equations and multiple linear regression equations were developed for all parameters for combined sex ($\pm 2.71 < SEE < \pm 3.58$) and for males and females ($\pm 2.36 < SEE < \pm 3.49$). By cross validation, estimated statures were found to be closely approximated with true statures ($\pm 0.67 < MAD < \pm 2.60$ and $\pm 0.68 < MSE < \pm 10.63$).

Conclusion: In conclusion, long limb bone measurements were useful in producing accurate regression equations. The regression equations developed could be used for both conventional and virtual methods, as both methods were equally accurate and reliable.

Keywords: Long limb, bones, stature estimation, CT scan, forensic anthropology

O14: Virtual Sex Estimation from Os Coxal Measurements in Adult Malaysians

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Introduction: The os coxa is sexually dimorphic and is the bone of choice for sex estimation in the forensic context. However, limited bone collections deterred the development of morphometric standards in Malaysia, which was recently overcome by the emergence of virtual anthropology. Thus, this study analysed the sexual dimorphism of the os coxa and determined its accuracy in sex classification in the Malaysian population.

Materials and Methods: A total of 206 multislice computed tomography (MSCT) scans were sampled (166 reference sample; 40 target sample). Following segmentation of the MSCT scans, three linear measurements (IH, innominate height; WIB, minimum iliac breadth; XPL, minimum pubic length) were acquired using Stratovan Checkpoint. Measurements were analysed using independent T-test and discriminant function analysis (DFA).

Results and Discussion: All linear measurements showed significant differences between male and female. The univariate DFA showed sex classification accuracy between 62% (XIB) to 84% (IH). The stepwise DFA yielded a predicted and cross-validated classification accuracy of 94%. Cross-validation of the derived discriminant function on the target sample showed 95% correct classification, indicating consistency in the sex classification.

Conclusion: The os coxa is sexually dimorphic with a high degree of expected classification accuracy rate. Based on the results of the present study, the methods may be used for sex estimation in the forensic context in Malaysia.

Keywords: Virtual anthropology, sex estimation, sexual dimorphism, pelvis, os coxa

O21: Effects of Metallothionein in Paraquat Induced Parkinson Disease Model of Zebrafish

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Introduction: Parkinson's disease (PD) is a chronic progressive neurodegenerative disease that caused by selective death of dopaminergic neurons in the substantia nigra pars compacta. Metallothioneins have been shown to be capable of regulating and mediating several important cellular processes. This study aims to identify the effect of administration of human metallothionein (hMT2) in paraquat treated zebrafish brain.

Materials and Methods: A total of 80 adult zebrafish (*Danio rerio*) aged 4 months old divided into four groups namely control, paraquat-treated, pre-hMT2-treated and post-hMT2-treated groups. Fishes were treated with paraquat intraperitoneally every 3 days for 15 days. hMT2 were injected intracranially at day 0 and day 16. The brains were collected at day 22 and analysed with qPCR, ELISA and immunohistochemistry.

Results and Discussion: The expression of *mt2*, *dat*, *th1* and *th2* were down-regulated following paraquat exposure and up-regulated following (pre- and post-) hMT2 treatment. However, *smtb* gene expression were up-regulated in paraquat and post-hMT2 groups. Lipid peroxidation were reduced in paraquat treated groups. However post-hMT2 groups showed increased in lipid peroxidation.

Conclusion: Paraquat is known as one of the pesticides that usually used in PD induced animal models and proven to be the cause of dopaminergic neuronal death. Treatment with exogenous hMT2 after paraquat exposure suggested that hMT2 can be a potential agent for management of PD.

Keywords: *Danio rerio*, dopamine, neuron, brain

O22: Histomorphometric Effect of Betel Quid with & without Tobacco on the Liver of Adult Mice

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Introduction: Betel quid (BQ) is considered as human carcinogen even without the additional use of tobacco. This study investigated the effect of BQ on the histomorphometric changes with and without tobacco on the liver of adult mice.

Materials and Methods: This case-control study was done on 30 adult mice of either sex. All 30 mice were divided into three groups equally, a control group (A), BQ with tobacco (B), and BQ without tobacco (C). The animals were sacrificed by cervical dislocation. The liver was separated, the morphological and histological normal and abnormal findings were recorded. The liver was set in 10 % formalin for 48 - 60 Hrs. The slides were prepared through routine paraffin method and marked with H&E stain.

Results and Discussion: The weight of liver reduced significantly in group C compared to control group A; similar significant change was noted in terms of fatty, degenerative and infiltrative changes ($p = 0.001$). A significant weight reduction was noted between group A and B ($p = 0.001$) though other changes was not obvious ($p = ns$). No significant difference was found between group B and C. There are some cohort studies conforming with the finding but this study is so far known to be the first experimental study to show the carcinogenic effect of BQ with or without tobacco on the liver.

Conclusion: This study revealed that chewing of BQ alone is as harmful as that with Tobacco. We recommend policy makers to build awareness program of the mass people regarding the harmful effect of BQ.

Keywords: Histomorphometry, betel quid, tobacco, liver, mice

O23: Ramus Intermedius is a Risk Factor for Coronary Arterial Disease: A Retrospective Study from Coronary Computed Tomography Angiography in UMMC

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Introduction: Ramus intermedius (RI) is a vessel which arises at the bifurcation of left anterior descending (LAD) and left circumflex (LCx) arteries. Presence of RI may increase wall shear stress (WSS) and vascular turbulence leading to coronary arterial disease (CAD). This study aimed to identify RI as a risk factor for CAD using coronary computed tomography angiography (CCTA) as a non-invasive modality to examine detailed coronary artery anatomy.

Materials and Methods: A retrospective review of 374 CCTA studies was carried out in University of Malaya Medical Centre (UMMC) between January 2017 to December 2018. Quantification of coronary artery calcium score (CACs) and degree of stenosis was evaluated during best diastolic post intravenous contrast injection. Presence or absence of RI was determined and CAD in each vessel was analysed using Chi square test and binary logistic regression.

Results and Discussion: RI was identified in 32.4% (n = 121) patients. RI, advance age, gender, diabetes and hypertension were significant risk factors for CAD (p < 0.001). Binary logistic regression analysis found that the presence of RI increased the risk of vascular calcification (Adjusted OR = 4.047, p < 0.001) and risk of coronary stenosis (Adjusted OR = 2.053, p < 0.001) compared to those without RI.

Conclusion: The key finding of this study demonstrated for the first time that RI is a strong non-modifiable risk factor for CAD. RI presence also increased CAD severity through increased vascular calcification and stenosis. It is postulated that RI induces large areas of WSS and turbulence that increases susceptibility for atherosclerosis formation and progression.

Keywords: Calcium Score, coronary arterial disease, ramus intermedius, risk factor

O24: Ageing Gracefully with Culinary and Medicinal Mushroom, *Hericium erinaceus* (Bull.: Fr.) Pers

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Introduction: Ageing-associated diseases impose public health burdens on Malaysian healthcare system. Bone health is a crucial issue in Alzheimer's disease (AD) due to a higher risk of falls and increased incidence of fractures compared to cognitively healthy older adults. *Hericium erinaceus* has been shown to possess neuroprotective and neuroregenerative properties. We extend our investigation into the alleviation of age-related disorders using a standardised extract of *H. erinaceus* (HESAE) developed in Malaysia. We examined the effects of HESAE on proliferation, differentiation and matrix mineralisation in an in vitro model of human foetal osteoblast (hFOB 1.19) cells and inhibition of acetylcholinesterase (AChE) activity.

Materials and Methods: hFOB 1.19 cells were treated with 0.05, 0.1 and 0.2 mg/mL of HESAE (n = 5). At each time point of day 1, 5 and 10, morphological evaluation and proliferation analysis were visualized using phase-contrast microscopy and alamarBlue ® assay, respectively. The dynamics of matrix mineralisation was assessed by Alizarin Red S staining. Inhibitory activity on AChE was determined by Ellman's method.

Results and Discussion: HESAE at 0.1 mg/ml significantly enhanced hFOB 1.19 cell proliferation after 5 days of incubation ($p < 0.05$), while 0.05 mg/mL HESAE promoted matrix mineralisation after 10 days of incubation, when compared to untreated control. It was also revealed that HESAE could effectively inhibit 50% of AChE activity at 13.5 ± 1.2 mg/mL. The activities were regulated by the standardised content of beta-glucans that are potent immunomodulators.

Conclusion: HESAE is expected to become a potential anti-ageing therapeutic as evidenced by its bioactivities in human foetal osteoblast.

Keywords: *Hericium erinaceus* mushroom, beta-glucans, senile osteoporosis, cholinesterase inhibitors

O25: Histopathological Changes in the Kidney of Experimental Diabetic Mice Following Treatment with Hydrolysed Bird's Nest

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Introduction: Diabetic nephropathy, a kidney-related complication of type 1 and type 2 diabetes, is associated with serious pathological changes. Bird's nest is widely used as a medicinal food in traditional Chinese medicine. The objective of the present study was to observe the histopathological changes in kidneys of type 2 diabetic mice following treatment with aqueous extract of hydrolysed edible bird's nest (HBN).

Materials and Methods: Male mice aged 12 weeks old, were divided into 5 groups: db/m+ (normal control mice), db/db (type 2 diabetic mice) untreated and treated with either HBN (75 mg/kg and 150 mg/kg) or glibenclamide (1 mg/kg) for 28 days, with each group comprising of six animals. The HBN and glibenclamide were administered via oral gavage. At the end of experimental period, both kidneys were collected for histopathological examination and immunochemistry to evaluate the morphological changes and the expression of glucose transporter 2 (GLUT-2) and GLUT-4 in the kidney tissues.

Results and Discussion: Kidneys of db/m+ mice had normal morphology of glomerulus and tubules. Kidney tissues of db/db mice showed glomerulosclerosis, degeneration of tubular and infiltration of mononuclear cells, which were normalised following administration of HBN. Immunohistochemistry showed that GLUT-2 and GLUT-4 expression level in the kidney of db/db mice were lower compared with db/m+ mice. Treatment with HBN in db/db mice increased GLUT-2 and GLUT-4 in the diabetic kidneys and was comparable with glibenclamide group.

Conclusion: Chronic treatment with edible bird's nest may be helpful in reversing the pathological changes and improving glucose uptake in the kidney of diabetes mellitus.

Keywords: Hydrolysed, edible bird's nest, histopathology, kidney, diabetic nephropathy

O26: *Gynura procumbens* Attenuates Isoprenaline-Induced Myocardial Oxidative Stress Effects in Rat Myocardium

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Introduction: Myocardial infarction (MI) is a major cause of death, worldwide. It occurs due to interruption of the oxygen supply to the heart. There is an association between oxidative stress with MI progression. Hence, supplementation with antioxidant-based pharmacotherapy could provide protection. This study was conducted to determine the cardioprotective effect of *Gynura procumbens* (GP) ethanolic extract on isoprenaline-induced MI in rats.

Materials and Methods: Forty-eight adult male Sprague-Dawley rats were administered GP 250 mg/kg (GP1), GP 500 mg/kg (GP2) and vehicle (Control) per oral for 28 days. During the final two days, MI was induced with Isoprenaline 85 mg/kg/day subcutaneously for two consecutive days, while non-MI groups received normal saline injection. The rats were sacrificed 24 hours post-injection. Serum troponin T, creatine kinase MB isoenzyme (CKMB) and lactate dehydrogenase (LDH) were analysed by ELISA kit. The antioxidant enzyme activities (SOD, GPx and CAT) and malondialdehyde (MDA) level in heart tissue were measured using a spectrophotometer. Histological analysis of myocardium was performed.

Results and Discussion: Isoprenaline induced-MI groups showed increase in troponin T, CKMB, LDH, cardiac MDA and reduced superoxide dismutase (SOD), catalase (CAT) and glutathione peroxidase (GPx) enzyme activities. Histopathological findings showed evidence of cardiomyocyte necrosis with an abundance of leucocytic infiltration, interstitial oedema and apoptosis. GP reduced the level of cardiac markers and MDA with increase in the antioxidant enzyme activities, preservation of myocardial architecture, lesser necrotic tissue and apoptotic bodies.

Conclusion: GP exerts its cardioprotective effects in isoprenaline-induced MI by increasing antioxidant enzyme activities and reducing lipid peroxidation

Keywords: Isoprenaline, myocardial infarction, *Gynura procumbens*, cardioprotective

O27: Studies on Redox Modulation of NLRP3 Inflammasome

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Introduction: Innate immunity provides host defence by NLRP3 inflammasome complex activation. Two steps of inflammasome complex formation are recognised: Signal 1 or priming (expression of NLRP3 protein, pro-IL-1 β , pro-IL-18 and pro-caspase-1) via NF- κ B, followed by inflammasome components assembled via Signal 2 (expression of active IL-1 β and IL-18). The aim of this study was to explore the capability of endothelial cells and differentiated THP-1 cells in activating the NLRP3 inflammasome via intracellular superoxide generators and slow-release hydrogen sulfide generation in the mitochondria.

Materials and Methods: PMA (5 ng/ml) was used to differentiate THP-1 cells for 1-3 days. Subsequent treatment with LPS (5 μ g/ml) for 24 hours primed the differentiated THP-1 cells followed by bzATP (300 μ M) for 1 hour for Signal 2 activation. Eventually, the effects of intracellular superoxide generators (mitoparaquat and paraquat at 1 and 5 μ M) were explored in differentiated THP-1 cells, pre- and post LPS administration.

Results and Discussion: Even though both endothelial cells exhibited low level of Signal 1 activation, only EA.hy926 cells expressed Signal 2 activation. Expectedly, NLRP3 inflammasome showed activation in differentiated THP-1 cells. Signal 1 NLRP3 inflammasome was not triggered by mitoparaquat and paraquat in PMA-differentiated THP-1 cells. Interestingly, 5 μ M of mitoparaquat was able to increase Signal 2. Furthermore, slow-release hydrogen sulfide donors (GYY4137 and AP39) were able to reduce Signal 2 NLRP3 inflammasome end products.

Conclusion: Pro and anti-inflammatory activities were observed in human monocytes by the role of redox active oxygen and sulfur species in modulating IL-1 β and IL-18 inflammatory pathway.

Keywords: NLRP3 inflammasome, mitochondria, mitoparaquat, hydrogen sulfide, THP-1 cells

O31: Melatonin Rescues Visual and Behavioral Deficits in Rd10 Mouse Model of Retinal Degeneration

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Introduction: Retinal degeneration 10 (rd10) is a mouse model of retinitis pigmentosa with rapid retinal photoreceptors degeneration. Although, recent study has demonstrated the delay of photoreceptors degeneration by melatonin treatment in rd10 mice, the mechanisms by which melatonin induced neuroprotection remained largely obscure.

Materials and Methods: Four weeks-old male rd10 mice received 28 days of intraperitoneal melatonin (10 mg/kg) treatment, and animals were behaviourally tested for changes of anxiety, social and visual memory performances. For mechanisms, electrophysiological and morphological/biochemical studies were conducted to further evaluate the neuroprotective effects of melatonin in this rd10 model.

Results and Discussion: Our results demonstrated that melatonin treatment rescued the rd10 behavioural deficits of anxiety, social and visual memory function as measured by the novelty-suppressed feeding test, social memory and visual memory tests. To validate these findings, experiments with temozolomide treatment revealed that the behavioural improvement by melatonin was mediated through both the neuroplasticity-dependent and -independent mechanisms. Interestingly, we also observed that melatonin restored the visual-evoked potentials recorded from neurons in the primary visual cortex; and improved the a- and b-waves in electroretinography, indicating that melatonin treatment retained the functional interaction and integrity between the retina and visual-cortical connection while protecting the retinal photoreceptors. Finally, these results were further supported by morphological/biochemical studies related to neuroplasticity-related mechanisms

in the retina, visual cortex and hippocampus.

Conclusion: Our findings suggest that melatonin could be a potential therapeutic drug in rescuing visual and behavioural deficits through neuroplasticity-dependent and -independent mechanisms in retinal degeneration.

Keywords: Melatonin, retinal degeneration, visual cortex, hippocampus, neuroplasticity

O32: *Hericium erinaceus* Rescued Motor and Purkinje Cell Deficits in Rat Model of 3-Acetylpyridine-Induced Cerebellar Ataxia

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Introduction: Cerebellar ataxia is a neurodegenerative disorder that is characterized by irreversible cerebellar atrophy and motor coordination deficits. There is no effective treatment to treat this debilitating disorder. Recently, *Hericium erinaceus* (H.E.), a culinary-medicinal mushroom has been shown to enhance neuroplasticity and antioxidative functions in both in vitro and in vivo findings. In this study, we tested the hypothesis of neuroprotective effects of H.E. in rescuing motor deficits in a rat model of acquired cerebellar ataxia.

Materials and Methods: Rat model of cerebellar ataxia was generated by single intraperitoneal injection of 3-acetylpyridine (3-AP; 40 mg/kg). Animals received daily injections of either H.E. (10 mg/kg or 25 mg/kg) or saline for 3 weeks; and they were tested for motor coordination and balance. Brain samples were processed for gene expression study of neuroplasticity-related function, and morphological study of the cerebellum by haematoxylin-eosin staining.

Results and Discussion: Our results demonstrated that 25 mg/kg H.E. significantly improved motor coordination and balance in ataxic rats. Gene expression analysis revealed significant normalization of *Dcx*, *Nestin*, *TrkB*, and *CREB* levels in 25 mg/kg H.E. treated rats, compared to the saline group. Purkinje cell deformation was found in all 3-AP-treated groups except for animals that received 25 mg/kg H.E. Regular morphology of Purkinje cells was retained in the cerebellar cortex of 25 mg/kg H.E. treated and non-3-AP control animals.

Conclusion: H.E. administration potentially rescued the motor and cerebellar Purkinje cell deficits in ataxic rats, indicating neuroprotective effects against 3-AP-induced cerebellar ataxia.

Keywords: Cerebellar ataxia, *Hericium erinaceus*, neuroprotection, motor deficits

O33: Protective Effects of *Hericium Erinaceus* (Bull.: Fr.) Pers. (Lion's Mane Mushroom or Cendawan Bunga Kobis) in *in Vitro* Models of Oxidative Stress

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Introduction: Oxidative stress is the key modulator in neurodegeneration. *Hericium erinaceus* is a medicinal mushroom and successfully domesticated to tropical climate of Malaysia. However, our knowledge about the potential role of *H. erinaceus* against oxidative stress and its mechanistic action in the restoration of cellular function impacted in ataxia and depression is still fragmentary. We explored the possible use of *H. erinaceus* standardised extract (HESAE) in the attenuation of oxidative stress in cellular models of inherited ataxia and mimics depression.

Materials and Methods: L-buthionine sulfoximine (BSO)-induced impairment in the Friedreich's ataxia (FRDA) dermal fibroblasts and high-dose corticosterone-induced impairment in the PC12 rat adrenal pheochromocytoma cells were employed in this study. Cell viability, apoptotic nuclei, lactate dehydrogenase (LDH) leakage, total glutathione (GSH), oxidised glutathione (GSSG) and generation of reactive oxygen species (ROS) were quantified.

Results and Discussion: Upon exposure of FRDA fibroblasts with 12.5 mM BSO and PC12 cells with 400 nM corticosterone for 24 hr, there was a reduction in cell viability to approximately 50% ($p < 0.05$). HESAE in the range of 0.25 - 64 mg/mL reversed the destructive oxidation process by increasing the viability to 85%, attenuating the apoptosis, decreasing the LDH release and intracellular ROS level, and increasing the GSH/GSSG ratio. A chronic deficit in the GSH/GSSG ratio is an indicator of oxidative stress. The protective effect is closely associated to the immunomodulatory effect of beta-glucans found in HESAE.

Conclusion: As a certified health product, HESAE appears suitable for counteracting detrimental effects of oxidative stress and free radicals.

Keywords: *Hericium erinaceus*, oxidative stress, Friedreich's ataxia, depression

O34: The Orexin-Neuroplasticity Mechanisms of Deep Brain Stimulation on Depressive-like Behaviours in Rat Models

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Introduction: Growing evidence has implicated the involvement of orexin in depression. Deep brain stimulation (DBS) has been shown to treat patients with treatment-resistant depression, and preclinical studies have demonstrated that this is mediated through hippocampal neuroplasticity pathways. While orexin has been linked to neuroplasticity, its role in DBS and depression remains unknown. In this study, we investigated the function of orexin on hippocampal neuroplasticity in animal models of depression.

Materials and Methods: Bilateral electrodes were implanted in the medial prefrontal cortex (mPFC). Animals were then tested for depressive-like behaviours in naïve and chronic unpredictable stress (CUS) paradigms. To further investigate the role of orexin on neuroplasticity, animals were injected with shOrexin/shControl-AAV and temozolomide. Immunohistochemistry, mass spectrometry, and RT-qPCR were conducted to investigate the orexin-neuroplasticity related mechanisms.

Results and Discussion: In this study, animals were tested with various stimulation parameters and we have identified that high-frequency stimulation (100 Hz) at 200 A amplitude produced maximal antidepressant-like effects in both the acute and chronic stimulation paradigms. Chronic DBS treatment continued to exert antidepressive effects, without a refractory response. Notably, we found that prepro-orexin mRNA was depleted in CUS-treated animals and DBS was able to reverse this condition. Further validating this finding, animals with shOrexin-AAV exhibited depressive-like behaviours, and DBS was shown to rescue these behavioural deficits. With temozolomide treatment, our results show that the antidepressant-like effects of mPFC DBS were dependent on the orexin-neuroplasticity function.

Conclusion: Our novel findings demonstrate the important role of orexin-neuroplasticity mechanisms in mediating antidepressant-like effects of DBS.

Keywords: Deep brain stimulation, antidepressant-like behaviours, orexin, neuroplasticity, depression

O35: Protracted L-Methionine Treatment with Prelimbic Cortical Electrical Stimulation Alleviates Anxiety-like Behaviour and Restores Cognitive Deficits in the Aged Rats

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Introduction: Global DNA methylation decreases along aging process and is associated with cognitive decline. Although deep brain stimulation (DBS) is a promising therapy for neuropsychiatric disorders, the potential interactions of DBS and epigenetic changes remain largely unknown. Here, we tested the hypothesis that DBS enhanced memory function through a methylation-dependent mechanism in an aged animal model of cognitive deficits.

Materials and Methods: We performed 4 weeks of protracted L-methionine treatment together with prelimbic cortical DBS in aged rats (n = 10 - 12 per group), and subsequently animals were behaviourally tested for anxiety and hippocampal-dependent memory. For mechanisms, gene expression related to the neuroplasticity-related functions were investigated in the hippocampus and amygdala.

Result and Discussion: Our results demonstrated that L-methionine treatment and DBS contributed synergistically to the restoration of spatial learning and memory of aged animals in Morris water-maze test. Interestingly, our data showed that the anxiolytic effects of DBS were mediated in a methylation-independent mechanism. DBS altered expression of immediate early gene in both hippocampus and amygdala, whereas both treatments upregulated the expression of Bdnf exon IV transcript that associated with contextual learning. Notably, L-methionine-DBS most effectively downregulated memory suppressor gene CaN expression specifically in hippocampus. These results further support the necessity of L-methionine in mediating the effect of DBS.

Conclusion: Our findings suggested that there is a certain threshold of methylation degree for DBS to effectively ameliorate age-dependent memory impairment. This study provides insight on potential interactions between DNA methylation and DBS as a novel therapeutic approach against age-related cognitive decline.

Keywords: Deep brain stimulation, DNA methylation, memory, neuroplasticity, aging

O41: Neuritin Abundance in PC12 Pheochromocytoma Cells Upon Medicinal Mushroom *Lignosus Rhinocerotis* (Cooke) Ryvarden Extract Treatment

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Introduction: Neuritin, a member of the neurotrophic factor family, is important in neuritogenesis, neurite arborization, and neurite extension. Neurite stimulatory effect of *Lignosus rhinocerotis* sclerotia extracts, are well documented. However, the correlation of neuritin abundance and neurite outgrowth in *L. rhinocerotis* treated PC12 cells still remains unknown. This study investigated the abundance of neuritin protein in PC12 cells upon treatment with *L. rhinocerotis* aqueous extract and NGF, either alone or in combination.

Materials and Methods: PC12 cells were cultured in DMEM with low serum and treated with NGF and *L. rhinocerotis* extracts (20-1280 µg/ml) for 48 hr prior to harvesting the protein for ELISA assay. Protein extraction was carried out with RIPA buffer while total protein quantification was performed according to bicinchoninic acid method. Average length of neurite was calculated from 20-30 cells in 5 microscopic fields at 200x magnification by measuring their axon-like extensions with each extension doubled the length of cell body diameter.

Results and Discussion: There was a significant difference ($p < 0.05$) in neuritin protein abundance in 640 µg/ml *L. rhinocerotis* aqueous-treated (5 ± 0.83 ng/ml) and 50 ng/ml NGF-treated PC12 cells (5 ± 0.96 ng/ml) as compared to untreated cells (1.6 ng/ml) with average neurite length of 98 ± 12 µm, 106 ± 13 µm and 73 ± 9 µm, respectively. This suggests that the potential mechanistic action of neurite outgrowth in PC12 cells upon *L. rhinocerotis* treatment could be facilitated by an upregulation in neuritin protein.

Conclusion: Neuritin protein abundance is directly proportional to the average neurite length in PC12 cells treated with *L. rhinocerotis*. The results show evidence of the involvement of neuritin in *L. rhinocerotis*-induced differentiation of PC12 cells.

Keywords: *Lignosus rhinocerotis*, neuritin, PC12 cells, average, neurite length

O42: Curcumin Improves Motor Coordination in Lead Induced Rats using Horizontal Bar Method

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Introduction: Lead (Pb) is a ubiquitous environmental toxin that is capable of causing neurodegeneration resulting into loss of motor coordination and cognitive functions. Curcumin is the main natural polyphenol in the rhizome of turmeric, it has a strong antioxidative and anti-inflammatory properties. This study was aimed at evaluating the therapeutic benefits of curcumin on Pb induced neuro-toxicity.

Materials and Methods: 36 male Sprague Dawley rats were randomly assigned into five (5) groups with 12 rats in the control (normal saline) and 6 rats for the lead treated group (LTG) (50 mg/kg lead acetate for 4 weeks), recovery group (RC) (50 mg/kg lead acetate for 4 weeks), treatment group 1 (Cur100) (50 mg/kg lead acetate for 4 weeks, followed by 100 mg/kg curcumin for 4 weeks) and treatment group 2 (Cur200) (50 mg/kg lead acetate for 4 weeks, followed 200 mg/kg curcumin for 4 weeks) groups each. Motor function was assessed using horizontal bar method while the concentration of Pb in the cerebellum of the experimental rats was evaluated using ICP-MS techniques.

Results and Discussion: Lead exposed rats showed significant decrease in motor score and significant increase in Pb concentration in their cerebellum. Treatment with curcumin for 4 weeks improved the motor score and reduced Pb concentration in the cerebellum of Cur100 and Cur200 groups of rats.

Conclusion: These results showed that curcumin ameliorates Pb induced neurotoxicity regardless of the dose used, via improving motor coordination. This could be due to the chelating properties of curcumin by reducing concentration of Pb in the rats' cerebellum.

Keywords: Curcumin, lead toxicity, motor coordination, neurodegeneration, ICP-MS

O43: Malaysian Brown Seaweed, *Padina australis* Hauck Inhibits Nitric Oxide Production in LPS-Stimulated BV2 Microglia

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Introduction: Microglial activation is one of the hallmarks of neuroinflammation. It contributes to the initiation and progression of several neurodegenerative diseases through an increased production of inflammatory mediators. Seaweeds are a food ingredient in Eastern Asian and intensively studied for their medicinal properties. In search of a marine origin therapeutic agent, we explored the possible use of *Padina australis*, as a potential strategy to effectively attenuate neuroinflammation in an in vitro model of LPS-stimulated BV2 microglia.

Materials and Methods: Fresh *P. australis* collected from Port Dickson was washed, freeze-dried and ethanol extract was prepared by sequential extraction. Total phenolic and flavonoid contents, reducing power and free radical scavenging activity were estimated spectrophotometrically. BV2 microglia were pretreated with the extract for 24 h before stimulating with LPS (2 µg/mL). Nitric oxide (NO) level was determined by Griess assay. The mechanism by which ethanol extract reduced the inflammatory response upon LPS stimulation was further supported by quantitative Western blotting analysis of pro-inflammatory mediators.

Results and Discussion: Pretreatment with ethanol extract of *P. australis* in the range of 0.5 to 8 mg/mL was observed to attenuate NO production in LPS-stimulated BV2 microglia in a dose-dependent manner, that are closely linked to its potent antioxidant activities. After 24 hours of pretreatment, NO production was completely inhibited without cytotoxic effects at 4 to 8 mg/mL. Mechanistically, the extract reduced the activation of cyclooxygenase-2 and inducible nitric oxide synthase signalling pathways upon LPS stimulation.

Conclusion: Our study demonstrated that *P. australis* is a potential marine candidate for the treatment of microglia-related neuroinflammatory diseases.

Keywords: *Padina australis*, BV2 microglia, neuroinflammation, inflammatory mediators

O44: Neuroprotection by Resveratrol against Collagenase-Induced Intrastratial Injury in Rats Involves Adenosine A1 Receptor Stimulation

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Introduction: Intrastratial haemorrhage (ISH) causes sensory and motor functional deficits among patients. Current evidences suggest an important role of adenosine receptor in the modulation of striatal pathways which might offer new strategy in the treatment of neurodegeneration. Since resveratrol has been shown to provide neuroprotection in animal models of ISH, this study was aimed to investigate involvement of adenosine A1 receptor (A1R).

Materials and Methods: Thirty male Sprague Dawley rats were divided into five groups: (i) control, (ii) sham, (iii) vehicle (0.1% DMSO saline), (iv) trans-resveratrol (0.9 µg) and (v) trans-resveratrol (0.9 µg) with A1R antagonist, DPCPX (2.5 µg). All pre-treatments (groups iii-v) were administered intracerebroventricular injection. Thirty minutes after pre-treatment, ISH was induced using collagenase through intrastratial injection. Forty-eight hours after ISH, rats were euthanized, and brains were subjected to gross and histological observations. Coronal sections of brain tissue were stained with haematoxylin & eosin, and immunohistochemistry was done using antibody to neuronal nuclear-specific protein (NeuN) and oligodendrocyte-specific protein (OSP).

Results and Discussion: Severe neurobehavioural deficits and total striatal haematoma with diffuse oedema were observed in ISH rats. Pre-treatment with resveratrol partially improved neurobehavioural deficits that was accompanied by reduction of haematoma volume by 73.22% ($p < 0.05$), damaged area by 60.77% and striatal neuron depletion by 71.23%. Resveratrol was able to attenuate haematoma expansion and alleviate secondary injury at perihaematomal region with subsequent reduction of neuronal and axonal bundle damage. Administration of DPCPX abolished neuroprotective effects of resveratrol.

Conclusion: This study demonstrates involvement of A1R in resveratrol-induced neuroprotection in ISH rats.

Keywords: Intrastratial haemorrhage, neuroprotection, adenosine A1 receptor, resveratrol

O45: CURCUMIN-LOADED COCKLE SHELL-DERIVED CALCIUM CARBONATE NANOPARTICLES ATTENUATES LEAD INDUCED OXIDATIVE STRESS IN RAT CEREBRUM

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Introduction: Lead (Pb) toxicity affects the biological systems resulting to homeostasis imbalance. Curcumin is a strong antioxidant but has poor bioavailability. This study investigated the ameliorative role of curcumin-loaded calcium carbonate nanoparticles (Cur-SCaCO₃NP) on Pb-induced oxidative stress in rat cerebrum.

Materials and Methods: Thirty-six male (Sprague-Dawley) rats aged 8 weeks (200 - 250 g) were randomly divided into 5 groups: Control (normal saline, 12 rats), LTG (50 mg/kg Pb, 4 weeks), Cur 100 [(50 mg/kg Pb, 4 weeks) + (100 mg/kg curcumin, 4 weeks)], Cur-CSCaCO₃NP 50 [(50 mg/kg Pb, 4 weeks) + (50 mg/kg Cur-CSCaCO₃NP, 4 weeks)], Cur-CSCaCO₃NP 100 [(50 mg/kg Pb, 4 weeks) + (100 mg/kg Cur-CSCaCO₃NP, 4 weeks)]. Six rats each from control and LTG groups were euthanized after 4 weeks. After 8 weeks, all the remaining rats in groups were euthanized. Samples were collected for organ function tests. The cerebral markers of oxidative stress were estimated using ELISA and SOD assay kits.

Results and Discussion: Pb-administered rats revealed a significant decrease ($p < 0.05$) in the SOD activities and a significant increase ($p < 0.05$) in the MDA levels when compared to the control. In addition, significant elevation ($p < 0.05$) in liver and kidney biomarkers in LTG group were observed. Treatment with Cur-CSCaCO₃NP significantly reversed ($p < 0.05$) the altered antioxidant biomarkers and

conversely lowered ($p < 0.05$) the liver and kidney enzymes as when compared to the free curcumin treatment. This could be because of the enhanced antioxidant effect of curcumin by the nanoparticles.

Conclusion: The results showed that CSCaCO₃NP enhanced the efficacy of curcumin by ameliorating the Pb-induced neuro-toxicity by attenuating oxidative stress.

Keywords: Cockle shell, curcumin, lead, neuro-toxicity, antioxidants, nanoparticles, drug delivery

O46: Effects of Paraquat and MPTP in the Zebrafish Brain

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Introduction: Parkinson's disease is a common neurodegenerative disease due to dopamine deficit in the substantia nigra. Studies have shown that MPTP (1-methyl-4-phenyl-1,2,3,6-tetrahydropyridine) and paraquat toxicities are associated with this disease. In this study, we aimed to identify the effect of administration of MPTP and paraquat in the zebrafish brain.

Materials and Methods: A total of 30 adult zebrafish was divided into three groups namely control, MPTP and paraquat-treated. A single dose of MPTP (30 µg/g body weight) was administered intracranially. Paraquat was administered intraperitoneally once every 3 days for 15 days. The brains were collected at day 14 for MPTP-treated group and day 22 for paraquat-treated group for qPCR analysis.

Results and Discussion: MPTP injection significantly up-regulated the expression of *th1*. The fishes were associated with reduced locomotor activity and dopaminergic neurons. Paraquat injection down-regulated the expression of *dat*, *th1* and *th2* significantly.

Conclusion: Exposure of toxins like MPTP and paraquat leads to dysregulation in dopamine-related genes, suggesting the use of zebrafish as an alternative vertebrate model to study Parkinson's disease.

Keywords: *Danio rerio*, dopaminergic neuron, environmental toxin, herbicide, neurodegenerative disease

O51: Effects of *Anastatica hierochuntica* Aqueous Extract on Prenatal Development of Sprague-Dawley Rats

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Introduction: *Anastatica hierochuntica* is a plant found in Middle-East countries. It is of concern that the herb is commonly consumed by pregnant women in Malaysia to ease the process of labour, despite the lack of studies evaluating its safety. This study aimed to investigate the potential maternal and foetal toxicity effects of *A. hierochuntica*.

Materials and Methods: Experiments were conducted in accordance to the Organisation for Economic Co-operation and Development guideline 414. Pregnant Sprague Dawley rats were randomly divided into four groups (n = 10): negative control (vehicle only) and experimental animals (250, 500, and 1000 mg/kg *A. hierochuntica* aqueous extracts (AHAE)). Treatment was administered orally from gestational day (GD) 6 to 20, followed by caesarean section on GD21.

Results and Discussion: There were significant reduction in the corrected maternal body weight (BW) gain of dams and BW of foetuses in the lowest and highest dose of AHAE-treated animals compared to the control. These findings were associated with the increase in anogenital distance index and congenital anomalies observed in some of the offspring. Interestingly, rats treated with 500 mg/kg showed no significant treatment-related effect.

Conclusion: Findings showed that AHAE is potentially harmful to the developing foetuses. However, the compensated effects of AHAE at 500 mg/kg and the presence of adverse effect in the lowest (250 mg/kg) tested dose (low observed adverse effect level [LOAEL]) has resulted in a non-monotonous dose response curve (NMDRC), which complicates the determination of the safest dosage.

Keywords: *Anastatica hierochuntica*, sanggul fatimah, prenatal toxicity, Sprague-Dawley rats, reproductive system

O52: Clavicle Morphometry for Sexual Dimorphism and Bilateral Asymmetry: Radiographic Assessment

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Introduction: The clavicle, modified long bone, presents morphological and bilateral variations. This may be due to genetic factors, hormones, or environmental and occupational influences. Anthropometric studies in clavicle of Nepalese population using radiograph has not been reported to best of our knowledge. This study aimed to determine the sexual dimorphism and bilateral asymmetry of clavicle in Nepalese Population using posteroanterior (PA) chest X-rays.

Materials and Methods: PA chest X-rays with normal and clearly visible both clavicles of 1260 Nepalese adults (591 male, 669 female), aged above 20 years, were utilized. Inbuilt software "CR Fugi CS7" was used for measurements (in cm) of sternal head length (SHL), acromial end length (AHL), mid shaft diameter (MSD) and length of clavicle (L). Demarcating point (DP) and identification point (IP) was calculated and statistical analysis was done.

Results and Discussion: All the parameters in male was greater than female which was significant except L/MSD. Similarly, all the parameters of right clavicle are significantly greater than left clavicle in both sexes except SHL and MSD. Demarcating point calculated from length of the clavicle (right > 16.17, left > 16.10 for male and right < 11.20, left < 10.65 for female) and MSD (right > 1.33, left > 1.38 for male and right < 0.66 and left < 0.67 for female) are important parameters to determine sex.

Conclusion: The clavicle shows significant sexual dimorphism and bilateral asymmetry in Nepalese population. The result of this study is helpful to anthropologist and forensic medicine.

Keywords: Clavicle, anthropometry, sexual dimorphism, PA chest x-rays, demarcating point

O53: Morphometric Analysis of the Sacrum on Malaysian Population

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Introduction: Sacrum is formed by fusion of five sacral vertebrae wedged between the two hip bones via sacroiliac joint. It is often found intact when conducting post-mortem examination on human remains. The present research aimed to study the morphometric variation of the sacrum based on stature, sex, ethnicity and age among Malaysian population for biological profiling.

Materials and Methods: A total of 373 DICOM folders from CT scans were selected from Kuala Lumpur Hospital. Sacral bones were virtually segmented by using Mimics Research 17.0 software. Ten sacral parameters being measured with 3D Builder 16.1 software and six sacral indexes were generated in this study for biological profiling. Another five age parameters were applied through MeshLab 2016.12 software.

Results and Discussion: The relative technical error of measurements was in the acceptable range at below 5% for both intra-observer and inter-observer analysis. The most useful sexual dimorphism parameters up to 85% accuracy of demarcation points were auricular lengths and the auricular index. Classification between Chinese and Indian achieved success rate range from 64.9% - 69.5%. The auricular lengths were also the most useful stature estimator at $R > 0.5$. Based on clustering weightage analysis, the most useful age differentiation indexes were corpora-basal index and alae base-wing index. Sacral auricular apex changes and S1 body surface changes at $R > 0.75$ were the most useful age estimators.

Conclusion: This population-specific study based on sacral morphometric could enhance the existing database of sex and age estimation on skeletal remains which is useful for Malaysian experts analysing sacrum.

Keywords: Forensic, anthropology, sacrum, sex estimation, age, computed tomography

O54: Study of Number of Germinal Centers of Vermiform Appendix in Bangladeshi Individuals of Different Age

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Introduction: Vermiform appendix is a tubular blind organ which lies close to caecum. It is called 'tonsil of abdomen' because there is presence of numerous lymphoid follicles in its histological structure. Germinal centre helps to identify individual immune status as it indicates lymphatic tissue response to antigen and consequence antibody production. Hence, by counting germinal centre we wanted to know the immune status of Bangladeshi population with advancing age.

Materials and Methods: The study was performed in Mymensingh Medical College which is located about 120 km north of Dhaka, the capital city. The sample was randomly selected among the population of that area from 2016 - 2017 through one year. For this reason, 40 vermiform appendices of different age groups, such as group A (up to 20 years), group B (21 - 40 years), group C (41 - 60 years) and group D (above 60 years), were collected after obtaining permission from ethical review committee. Sample was selected randomly for these analytic studies. To count the germinal centre, lighter staining centrally placed area of lymphoid follicle were observed in entire microscopic field (X4 objective X10 eye piece) and their number was counted and noted. Following that, the mean number of germinal centres per age group was calculated.

Results and Discussion: In this study mean \pm SD number of germinal centres was 3.20 ± 1.666 , 2.40 ± 0.663 , 1.50 ± 1.118 and 0.00 ± 0.00 in advancing age group in the present study. Here germinal centre is inversely proportional to the advancing ages which was statistically highly Significance where $r = -0.803$ and p -value was < 0.00001 .

Conclusion: It has been proved in the study that the number of germinal centres was decreasing with advancing ages.

Keyword: Germinal centre, vermiform appendix, lymphoid follicle

O55: Teaching Anatomy in an Integrated Medical Curriculum: Anatomists' Perspective

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Introduction: Medical curricula have gone through progressive changes during the past few decades, which lead to more integration. Likewise, anatomy teaching changed in order to fit into integrated medical curricula. However, the impact of integration on anatomy teaching remains largely not documented. This study investigates anatomists' perception of teaching anatomy in integrated medical curricula.

Materials and Methods: Anatomy instructors from three medical schools, previously known to have integrated medical curricula, from the Arabian Gulf Countries participated in focus group interviews. One focus group interview was conducted in each of the three medical schools. Interviews were recorded and transcribed verbatim. Data were analysed through thematic analysis.

Results and Discussion: Five themes emerged from the data analysis describing anatomists' perception of teaching anatomy in integrated medical curricula: (1) Relevance of anatomy to clinical practice, (2) Anatomy teaching time, (3) The place of dissection, (4) Anatomy teachers and (5) Anatomy students. While the anatomy taught in integrated curricula was praised for being clinically relevant and focused, there were concerns about skipping important basic anatomical knowledge. Integrated curricula have less scheduled anatomy teaching time, which reflected in teaching lesser anatomy content and inability to incorporate dissection. On a personal level, anatomists learn and teach other medical sciences, interact more with students and use innovative teaching methods; although this increases their work load.

Conclusions: Despite the perceived advantages of teaching anatomy in integrated medical curricula, there are some drawbacks. Therefore, anatomy content needs to be designed in a way to maximize the advantages and minimize the drawbacks.

Keywords: Anatomy, integration, curriculum

O56: Impact of Team-based Learning (TBL) on Students' Cognitive Engagement in Gross Anatomy Practical Session

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Introduction: Deterioration of anatomy knowledge and lack of engagement during anatomy classes among medical students could be due to various problems in the anatomy curriculum. Hence, it is pertinent to deal with these problems through - attainment of cognitive, psychomotor and affective learning competencies, which could be accomplished through implementation of - active learning strategy during anatomy classes. This study aims to determine the impact of TBL, a form of small-group learning in large group cohort-in gross anatomy practical session on students' cognitive engagement.

Materials and Methods: A randomized controlled trial was conducted on 215 consented students, who were divided into TBL and control groups. All students attended a lecture on a gross anatomy topic, and they were subsequently assigned with an individual pre-class task that was to be submitted prior to the actual anatomy practical class. On the intervention day, TBL group underwent for TBL-oriented practical class, while the control group attended a normal demonstration practical class. Learners' Engagement and Motivation Questionnaire (LEMQ) was used to measure the difference of students' engagement level between the two study groups.

Results and Discussion: Participants in the TBL group obtained a significantly higher engagement score compared to the control group ($p = 0.044$, $Z\text{-stats} = -2.018$). It was postulated that TBL-oriented practical session optimized the students' attention focus through the TBL group activities.

Conclusion: Reinforcement of students' engagement level in anatomy practical can be achieved through the application of TBL-oriented classes. TBL enforces active learning strategies that facilitate students invested mental effort while learning the topic.

Keywords: Team-based learning, active learning, engagement, cognitive, gross anatomy practical

O57: Animated Embryology Class Through Mobile Technology at Asia Metropolitan University

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Introduction: Mobile technologies have the potential to enhance conceptual learning of undergraduate students. Different studies showed that successful use of mobile technologies improves student's capacity for clinical decision making. The procedure has no extra cost, no need training and more manpower, hence beneficial for faculties and institutes.

Materials and Methods: A cross-sectional analytic study has been done to the year 1 MBBS student of Asia Metropolitan University. A total number of 62 students were divided into two batches. First batch students were taught with diagrams and the flow chart using power point. In the next batch, students were taught with animated embryology CD ROM Simbryo of Langman's Medical Embryology book through mobile or tab. Students learning of both classes were tested by 5 SBAQs at the end of each class respectively in the online platform and the scores of both tests was compared statistically. Results and discussion: The statistical analysis of the scores of test 1 with diagram showed mean \pm SD (8.3 ± 6.2) and in the test 2 with animation through mobile showed mean \pm SD (17.5 ± 6.5) at 95% CI with significant P value ($p \leq 0.01$).

Conclusion: The present study showed the students were able to understand better the embryology class by animated teaching in mobile technology than the power point lecture with diagrams.

Keywords: Mobile technology, animation, embryology

POSTER PRESENTATIONS

P01: Toxic Effect of Xylene Exposure on Reticulin Fibres in Sprague-Dawley Rat Liver

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Introduction: This study was to investigate the toxic effect of xylene exposure on the liver tissue of Sprague-Dawley rats.

Materials and Methods: Twelve 28-day-old Sprague-Dawley rats were divided into control and xylene group. The xylene group was given 8.47 mmol/kg/day of xylene in olive oil vehicle while the control group received only olive oil vehicle via oral route for 2 weeks. Then, the rats were sacrificed, and the sections of liver were stained with reticulin staining. The fine structure of sectioned specimens from the liver was investigated under microscope for qualitative analysis.

Results and Discussion: The study revealed that xylene exposure had caused a reduction in reticulin fibres of the liver. Reticulin crowding areas therefore showed focal loss of hepatocytes. Large areas of cell necrosis appeared as reticulin collapsed.

Conclusion: The reticulin stain provides important information about the architecture of the liver as reticulin provides the stromal support for the parenchyma. When hepatocytes are damaged and undergo necrosis, they collapse in the empty space left behind by the reticulin fibres surrounding them.

Keywords: Xylene, reticulin, necrosis

P02: Phenotypic Comparison Of Human Corneal Epithelial hTCEpi and 10.014 pRSV-T Cell Lines

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Introduction: Shortage of suitable donors and limited lifespan of the human primary corneal epithelial cells (HCEC) leads to the development of the experimentally modified HCEC which is frequently used in the ex vivo cell culture research. The best source of cell in this study is the one that can retain the phenotypic characteristics of a normal primary HCEC. This study aimed to compare the phenotypic changes and proliferative capacity of two immortalized HCEC hTCEpi and 10.014 pRSV-T cells line.

Materials and Methods: hTCEpi and 10.014 pRSV-T cells were grown in keratinocyte growth medium (KGM) and keratinocyte-serum free medium (K-SFM) respectively and supplemented with epidermal growth factor (EGF). The cultures were incubated at 37°C in a humidified 95% air with 5% CO₂. The cultures were expanded after reaching 80 - 85% confluence. Morphological characteristics and proliferative capacity of both cells were analysed.

Results and Discussion: hTCEpi cell line exhibited consistent uniformity of small, dense and compact polygonal-shaped cells with cobblestone-like appearance throughout the culture period. hTCEpi cell line has greater proliferative capacity demonstrated by multiple culture passages with high cell yield. In contrast, 10.014 pRSV-T cell lines exhibited heterogenous morphology with abundance of flattened, enlarged, irregular-shaped cells, with ill-defined cell border interspersed between the small colonies of polygonal-shaped cells, and showed signs of senescence in passage 2.

Conclusion: These findings suggest that the hTERT cell line is the best choice for in vitro model HCEC-based study as it was able to retain the normal phenotypic features with greater proliferative capacity.

Keywords: Corneal epithelial cell, phenotype, immortalized cell line

P03: Dermal Precursors – an Identity to Bone Marrow Population

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Introduction: During radiotherapy, burns and trauma, the tissue response to injury and homeostasis is lost. The injured tissue undergoes epithelisation, granulation tissue formation and angiogenesis, leaving behind a scar tissue. Our study aims isolation, characterization and ex-vivo differentiation of Bone marrow mesenchymal stem cells (BMSCs) to dermal precursors, so that, it can be used to retain tissue homeostasis.

Materials and Methods: Two Wistar albino rats weighing 80 g was used for BMSCs isolation using gradient centrifuging method. Isolated BMSCs was characterised and differentiated to dermal precursors. Immunocytochemistry was performed with 4',6-diamidino-2-phenylindole (DAPI) staining.

Results and Discussion: Isolated BMSCs was characterised by spindle shaped morphology and plastic adherence property. BMSCs on flow cytometry exhibit positive CD90 & negative CD34 cells. 70 - 80 % confluent second passage cells were added with keratinocyte growth supplement media and bone morphogenic protein-4 (BMP4) for dermal differentiation. Dermal precursors were stained with DAPI immuno staining.

Conclusion: Dermal precursors may serve as an important identity to bone marrow population. This therapeutic potential of differentiated dermal precursors can assist dermatologist and surgeons to accelerate wound closure and decrease healing time.

Keywords: Bone marrow, mesenchymal stem cells, differentiated dermal precursor, tissue culture, Wistar rats

P04: The Effects of Xylene on Histology of Spleen in Female Adolescent Sprague-Dawley Rat

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Introduction: Xylene is an aromatic hydrocarbon that is widely used in industries and xylene exposure has been associated with effects on a number of organ systems. The spleen tissue contains red pulp and white pulp and lymphocytes serve as body defence mechanism for foreign invasion of toxic substances. We hypothesize that xylene exposure might affect cellular morphology of spleen in white pulp. The objective of this study was to compare the histological changes in measurement area of white pulp, marginal zone, germinal centre between xylene exposed and non-exposed rats.

Materials and Methods: Twelve Sprague Dawley female rats (n = 12) were randomly divided into two groups; control group and xylene group. The xylene was mixed with olive oil and administered by oral gavage for 10 days. Rats were sacrificed and their spleens were removed for histological studies. Cross sections of spleen were stained by haematoxylin and eosin to analyse the changes in white pulp of spleen. The white pulp, marginal zone and germinal centre were compared within groups. Quantitative analysis on the size of the white pulp of spleen after the exposure to xylene was done.

Results and Discussion: Image captured showed that xylene exposure caused an increase in size of white pulp of spleen indicating an increase in number of lymphocytes. There was significant difference between the control group and the xylene exposure group (p value 0.009*). The median size of the white pulp of spleen in the control group was 80361.42 µm and xylene group was 113047.78 µm.

Conclusion: Xylene exposure increases the size of white pulp of spleen in female Sprague-Dawley rat thus increasing the number of lymphocytes.

Keywords: Xylene, histology, spleen, female, adolescent, Sprague Dawley rats

P05: Apoptosis Versus Necrosis: An Electron Microscopic Features of Hepatotoxicity

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Introduction: Hepatotoxicity developed from exposure to various insults, may end up as a liver failure. In toxicology studies, the electron microscopic examination of the tissue may provide the earliest evidence of liver injury. This study focussed on electron microscopic features of apoptosis and necrosis following hepatotoxicity.

Materials and Methods: Twelve Sprague-Dawley rats were randomized into two groups. Hepatotoxicity was induced in the treatment group, Group II (n = 6) by giving *Mitragyna speciosa* methanol extract 500 mg/kg dissolved in 15% Tween 80, while the control group, Group I received the vehicle, 15% Tween 80. Both groups received their treatment for 28 days via oral gavage.

Results and Discussion: The treatment group showed both features of apoptosis and necrosis. Apoptosed hepatocytes appeared to shrink and assumed 'star' shaped. The nucleus was condensed and become pyknotic. The plasma membrane showed bleb formation. Advanced bleb became an apoptotic body that was phagocytosed by the adjacent cells. In necrotic hepatocytes, the plasma membrane appeared disintegrated. The nucleus was irregular and showed karyorrhexis.

Conclusion: Hepatotoxicity developed following induction with *Mitragyna speciosa* results in hepatocyte necrosis and apoptosis. Both these conditions can be detected early using electron microscope, developed from different mechanism of injury. Hence, it is important to be able to appreciate these two conditions to further study the mechanism of hepatocyte injury.

Keywords: Hepatotoxicity, apoptosis, necrosis, electron microscopy

P06: Protective Effect of Flavonoid-Rich-Fractions of *Polygonum minus* against Cisplatin-Induced DNA Damage and Apoptosis in Rat Liver

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Introduction: Cisplatin (CP) is a well-known chemotherapeutic drug, known to cause hepatotoxicity. *Polygonum minus* (Pm) is a local herb with anti-apoptotic activity. This study aimed to explore the protective effect of Pm-flavonoid-rich-fractions (Pm-FRF) against CP-induced DNA damage and apoptosis in livers of healthy rats.

Materials and Methods: Thirty adult male Sprague Dawley rats were randomly divided into five groups: (A) Control (normal saline, NS), (B) CP 10 mg/kg, (C) Gallic acid (GA), (D) Pm-FRF 100 mg/kg and (E) Pm-FRF 200 mg/kg. Groups A and B were given distilled water, and Group C was given GA orally, whereas Pm-FRF groups (groups D and E) were given Pm-FRF orally for 14 days. On day 15, a single intraperitoneal administration of NS was given to group A, and CP was administered to other groups. All rats were sacrificed on day 18. Liver tissue was analysed for histology, ultrastructure, DNA damage and apoptosis markers (p53, apoptosis promoting factor-1 (Apaf-1), caspase 9 and caspase 3) quantified by Quantitative Polymerase Chain Reaction (qPCR).

Results and Discussion: CP caused impairment in liver architectures while Pm-FRF groups preserved the livers microscopically. Expression level of p53, Apaf-1, caspase 3 and 9 were up-regulated significantly in CP group ($p < 0.05$) indicating DNA damage and apoptosis. However, Pm-FRF 100 and 200 mg/kg down-regulated the expression level of p53, Apaf-1, caspase 3 and 9 significantly ($p < 0.05$), which was due to the anti-apoptotic and DNA damage effect of the flavonoids.

Conclusion: Pm-FRF showed anti-apoptotic and anti-DNA damage, thus it can be suggested to improve CP-induced hepatotoxicity.

Keywords: Hepatotoxicity, cisplatin, apoptosis, DNA damage, liver

P07: Mushroom Extracts of *Hericium erinaceus* and *Lignosus rhinocerotis* Induce Proliferation and Differentiation in HT-22 Cells

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Introduction: Learning and memory are associated with the hippocampus. Its deterioration due to diseases or aging can have major consequences in one's quality of life. Researchers found that functional food such as medicinal mushrooms can exert neuroprotective effects and were able to stimulate neurite outgrowth in neuronal cell lines such as in PC-12 cells and SH5-SY cells or even on primary cell lines.

Materials and Methods: Hot water extracts of freeze-dried powder of *Hericium erinaceus* fruiting bodies and *Lignosus rhinocerotis* sclerotium were used in this project. 3-(4,5-dimethylthiazol-2-yl)-2,5-diphenyl tetrazolium bromide (MTT) assay was carried out to determine the effects of mushroom extracts on cell viability of HT-22 neuronal cells. HT-22 neuronal cells were cultured in a 24-well plate and neurites extensions that was double the length of the cell body were scored as positive.

Results and Discussion: The highest cell viability was recorded at 12.5 µg/mL for both *H. erinaceus* (115.96 ± 7.16%) and *L. rhinocerotis* (120.61 ± 2.72%) extracts. They were significantly ($p < 0.05$) higher when compared to negative control. It was shown that 25 µg/mL of *H. erinaceus* extracts gave maximum neurite extensions at 34.82 ± 6.98% and 12.5 µg/mL of *L. rhinocerotis* extracts showed significant ($p < 0.05$) increase of neurite extension of 46.19 ± 6.60% compared to the negative control.

Conclusion: *H. erinaceus* and *L. rhinocerotis* hot aqueous extracts were able to stimulate cellular proliferation and differentiation at low concentrations of 25 µg/

mL and 12.5 µg/mL respectively. As proliferation and differentiation of neurons are largely associated with learning and memory formation, results of this study show that both *H. erinaceus* and *L. rhinocerotis* extracts may have potential to improve these cognitive functions.

Keywords: Medicinal mushrooms, HT-22 neuronal cells, *Hericium erinaceu*, *Lignosus rhinocerotis*

P08: Evaluation of Anabolic Effects on Bone Structure of Sham Treated Kelulut Honey in Male Rats

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Introduction: Anabolic effect of polyphenols on bone metabolism is prominent and it is present in Kelulut Honey (KH). KH carries more advantage than other honey in exploring its potential health benefits as it is stingless. This study aimed to determine the KH anabolic effects on bone structure.

Materials and Methods: Twenty-one male rats (n = 21) were used. Fourteen KH-treated sham rats were divided into two groups with both were given intramuscular injection of vehicle palm olein 0.05 mL/kg/day followed by oral KH; ShamKH1 = 200 mg/kg/day and ShamKH2 = 400 mg/kg/day respectively. While other seven solely sham rats were given vehicle palm olein 0.05 mL/kg/day by intramuscular injection and 0.1 mL/kg/day orally. After two-months of treatment, the rats were euthanized. Femoral bones were harvested for micro-CT evaluation.

Results and Discussion: Micro-CT revealed that two-months of treatment of different KH doses which were the ShamKH1 and ShamKH2, had no significant increase in trabecular bone volume (BV/TV), trabecular number (Tb.N) and trabecular thickness (Tb.Th) compared with the solely sham group (p > 0.05). There was also no significant decrease in trabecular bone separation distance (Tb.Sp) (p > 0.05). Despite all showing the expected trend, effect of KH was still inadequate to stimulate osteoblast to increase bone formation represented in bone structure.

Conclusion: These results suggest that KH may have the potential for bone anabolism. However, a larger sample size, longer study duration, and higher KH dose may need to be considered in the future study for the robust anabolic effect.

Keywords: Kelulut honey, osteoporosis, bone anabolism

P09: Stem Cells: Maintenance of the Cornea and Retina

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Introduction: Stem cells possess vast potential in its differentiation and self-renewal capacity. Due to those qualities, stem cells are now central in the field of regenerative medicine. The present review aimed to summarise the essential features of the different types of stem cells especially in vital areas of the eye, the cornea and retina.

Materials and Methods: This review is based on the articles retrieved from online databases such as Medline, Scopus, NCBI, PubMed and Google Scholar.

Results and Discussion: Limbal stem cells (LSC) are found in the limbus of cornea. These cells maintain the functional integrity of cornea and conjunctiva. Residing in a specialised environment of the limbus, LSC need specific factors to continuously replace the epithelium of both cornea and conjunctiva. Any defect in the stem cells or the normal limbal environment would compromise the balance between the cornea and conjunctiva, thus the transparency of the cornea. Retinal stem cells on the other hand differentiate into retinal pigmented epithelium, retinal endothelium and photoreceptors early in human life. These stem cells become inactive in adulthood, leading to irreversible damage to the visual pathway later in life. Since affected limbal or retinal cells need to be replaced by cells with the same function, there are increasing number of studies on stem cell-based therapies addressing corneal and retinal diseases.

Conclusion: This concise explanation on the corneal and retinal stem cells could potentially enhance the understanding of developmental anatomy of the eye and in the pursuit of optimum ocular therapies to improve vision.

Keywords: Eye, stem cell, limbal, retinal

P10: Duplication of Inferior Vena Cava-Case Report of an Anatomic Variation

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Introduction: The inferior vena cava (IVC) is the largest vein in human being draining the blood from the lower part of the body running along the right side of the abdominal aorta. Double IVC is a rare congenital anomaly with an incidence of 0.2% - 3%.

Materials and Methods: This case of double IVC was observed during dissection of the abdomen of an adult male cadaver in the dissection hall of Anatomy, Faculty of Medicine, International Islamic University Malaysia. We report the presence of normal IVC on the right side with a left sided one seen running parallel to it. This left sided IVC began at the junction of the left internal and external iliac vein dorsal to the left common iliac artery at the level of fifth lumbar vertebra. It joined the right IVC ventrally to the abdominal aorta at the level of first lumbar vertebra by connecting venous anastomosis. The left suprarenal vein drained to this connecting part between the right and left IVC.

Discussion and conclusion: Double IVC are relatively uncommon and can prolong smoothly without any adverse consequences abnormalities. The anomaly is important in some situations such as retroperitoneal surgery, vascular interventional procedures, placement of IVC filters and various surgical / radiological techniques.

Keywords: Inferior vena cava, duplication, congenital, variation, dissection

P11: Caudal Regression Syndrome: A Case Report

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Introduction: A case of sacral agenesis associated with congenital heart disease and hypoplasia of limbs was treated in Sri Ramachandra Hospital. The case is unique for its rarity and embryological significance.

Case Report: A 30-year-old gravid 3 para1 live1 already treated for secondary infertility, gestational diabetes mellitus and hypertension was admitted in Sri Ramachandra Hospital near term with a breech presentation. Labour was induced due to gestational diabetes and foetal bradycardia. She delivered by assisted breech delivery. The child had neonatal respiratory distress, did not cry at birth and was not breast feeding well, had hypoplastic limbs and was treated in the neonatal intensive care unit. Infantogram revealed sacral agenesis and cardiomegaly. The child's echocardiogram revealed small left ventricle, dilated right ventricle, single outflow from right ventricle and truncus arteriosus. Antenatal ultrasonogram at 36 weeks revealed a single live foetus of 36 weeks gestation with breech presentation, single umbilical artery, hypoplasia of left ventricle.

Discussion: Sacral agenesis with congenital heart disease, single umbilical artery, hypoplasia of limbs in this case is a part of caudal regression syndrome. The cause could be genetic though majority is sporadic in occurrence. It is associated with maternal diabetes mellitus. Abnormal migration of neural crest cells is also a probable cause.

Conclusion: Identifying high risk mothers, prenatal screening, possible preventive measures and sometimes intrauterine corrective measures for the birth defect are the only tools to detect and treat such congenital anomalies.

Keywords: Sacral agenesis, caudal regression syndrome

P12: Study On The Weight Of The Placenta And Birth Weight Of The Neonate In Lumbini Zonal Hospital, Nepal

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Introduction: Placental weight is a summary measure of placental and foetal growth. Small placenta may be associated with trisomies, whereas large placenta may be associated with maternal diabetes. Low placental foetal weight ratio (PFWR) could reflect acute placental injury, maternal anaemia or malnutrition whereas high PFWR may be seen in maternal hypertension.

Materials and Methods: A descriptive cross-sectional study. Of the total, 798 subjects met the inclusive criteria. After consent, age, sex, prepregnancy weight, weight of mother at the time of delivery, neonatal weight, height, trimmed placental weight were recorded.

Results and Discussion: The mean value of placental weight was 489.29 ± 59 g ranged between 250 - 750 g while the mean birth weight was 2818.4 ± 447.19 g range of 3000 g. The average gestational age at the time of delivery was 38.86 ± 1.22 . Increase in birth weight of the neonate was associated with corresponding increase in placental weight.

Conclusion: There is statistically positive relation between placental weight and weight of the neonate ($r = 0.513$, $p < 0.001$) at the time of birth. However, the ratio of the placental and neonatal birth weights decreases ($r = -0.188$, $p < 0.001$) with advancing gestational age statistically. Thus, prolongation of pregnancy at term may adversely affect the foetus.

Keywords: Placental weight, foetal weight, placental foetal weight ratio

P13: Pancreatic Steatosis Induced by Fructose Drinking Water in an Established Metabolic Syndrome Rat Model

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Introduction: Fat infiltration in the pancreas also known as pancreatic steatosis is a well-known complications of metabolic syndrome. This data is a continuation of study done earlier using the established model of metabolic syndrome in the Wistar rat, which include obesity, hyperglycaemia, hyperlipidaemia and hypertension. We aimed to evaluate and observe the changes in the pancreas in such model.

Materials and Methods: Twelve male Wistar rats were used and were randomly divided into two groups; control and metabolic syndrome. The rats were given normal rat chow and tap water in control group; meanwhile, in metabolic syndrome group there were supplemented with normal rat chow and fructose-drinking water 20% as ad libitum for eight weeks. The measurements for metabolic syndrome were done based on previous protocol. At the end of the experiment, the pancreas was weighted (g) and histomorphology was evaluated by using Haematoxylin & Eosin staining. All data were analysed and presented in mean \pm SEM subjected to one-way ANOVA.

Results and Discussion: Weight of the pancreas in the metabolic syndrome group showed increased significantly. Histomorphology of the pancreas showed presence of the lipid vacuoles which were arranged scattered in all parts of the pancreatic gland. The increment of the weight of the pancreatic gland was due to presence of fatty infiltration and it can be related to hyperglycaemia in this model.

Conclusion: Pancreatic steatosis was developed in this model following consumption of fructose-drinking water 20% in just eight weeks. A further study on the changes of pancreatic cells is highly recommended.

Keywords: Pancreatic steatosis, metabolic syndrome, Wistar rat, fructose drinking water

P14: Splenunculi, Can Mimic Acute Abdomen: Its Clinical and Surgical Relevance

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Introduction: Accessory spleen or splenunculi are small masses of normal splenic tissue which are separated from the main spleen during embryogenesis. In most of the subjects these are asymptomatic and may be discovered incidentally in 16% of patients at laparotomy or during USG / CT of abdomen. Few are noticed during dissection of cadavers in Anatomy teaching. Its important for surgeons to be aware about such small masses of splenic tissue during splenectomy for, if they are left unnoticed after total splenectomy it may lead to recurrence of disease (of spleen).

Materials and Methods: The aim of the study was to report the findings of splenunculi found in gastro splenic ligament during routine undergraduate dissection in a 55-year-old male cadaver in the department of Anatomy, AIIMS, Bhubaneswar. No other variation was noted in this cadaver related to branches of celiac trunk. The splenunculi was confirmed by histology and immunohistochemistry (IHC).

Results and Discussion: The normal spleen was located in the left hypochondriac region which was supplied by splenic artery. A small mass of splenic tissue (splenunculi) about 1 x1.5 x1 cm in size on naked eye appeared to have the same gross appearance as that of the spleen present in gastrosplenic ligament. Tissue processing and H/E staining / IHC of splenunculi confirmed our findings suggestive of spleen with white pulp and red pulp.

Conclusion: These splenunculi may mimic signs of acute abdomen due to torsion and infarction along the neurovascular pedicle. If unnoticed after total splenectomy for haematological disorders, it may undergo hyperplasia and recurrence of disease. Hence, knowledge about splenunculi is important for surgeons.

Keywords: Spleen, splenunculi, torsion, splenectomy

P15: Caix Immunohistochemistry has Potential to Predict Renal Cell Carcinoma Outcomes: A Systematic Review and Meta-Analysis

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Introduction: Tissue biomarker carbonic anhydrase IX (CAIX) is claimed to have a prognostic value for renal cell carcinoma (RCC) but various contradicting findings have also been documented. This study aims to perform a systematic review and meta-analysis on the role of CAIX in RCC disease progression.

Materials and Methods: Following the preferred reporting items for systematic review and meta-analysis (PRISMA) guidelines, 1904 articles from multiple databases were retrieved from inception until December 2017. Inclusion criteria included all English language based original articles of immunohistochemistry studies investigating CAIX expression in human RCC tissue. Standard meta-analysis methods were applied to evaluate the role of CAIX in RCC prognosis. The relative risk (RR) and its 95% confidence interval (CI) were recorded for the association between biomarker and tumour stage, grade, lymph node involvement and ECOS-PS index. Four articles were finally meta-analysed using MedCalc statistical software.

Results and Discussion: Meta-analysis showed that high CAIX expression was associated with low tumour stage (RR 0.90%, 95% CI 0.849 - 0.969, $p = 0.004$), low tumour grade (RR 0.835%, 95% CI 0.732 - 0.983, $p = 0.028$), absence of nodal involvement (RR 0.814%, 95% CI 0.712 - 0.931, $p = 0.003$) and better ECOS-PS index (RR 0.888%, 95% CI 0.818 - 0.969, $p = 0.007$). Hence, high tissue CAIX expression in RCC indicates an early malignancy with a potential to predict favourable disease progression and outcome.

Conclusion: Measurement of this marker may be beneficial to determine the progression of the illness. It is opined that CAIX can be developed as a specific tissue biomarker for RCC in the near future.

Keywords: Carbonic anhydrase IX, immunohistochemistry, kidney cancer, prognosis, survival

P16: The Prediction Model of Aortic Bifurcation

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Introduction: Injury to common iliac artery (CIA) or aorta during lumbopelvic surgical procedure is not so far an uncommon complication with high morbidity and mortality rates. The purpose of this study was to investigate the aortic bifurcation, the left and right CIAs for their lengths, diameters and angles of branching.

Materials and Methods: The aorta and CIAs of the cadavers were investigated and measured.

Results and Discussion: Fifty cadavers with normal abdominal vessels, 27 males and 23 females, were enrolled. Mean age was 69.6 ± 12.1 years. The respective mean \pm SD diameter of the aorta, left and right CIAs were 1.72 ± 0.19 , 1.26 ± 0.19 and 1.25 ± 0.10 cm. The mean \pm SD length of the left and right CIAs were 4.89 ± 1.38 and 4.47 ± 1.12 cm. The left CIA was longer than the right one ($p = 0.001$). The mean \pm SD angle of left and right CIAs were 28.40 ± 7.37 and 30.29 ± 15.51 degrees without statistical difference ($p > 0.05$). Diameter of aorta, left and right CIAs were correlated well with the Murray's formula (Pearson's coefficient 0.824). The left CIA was longer, more vertical and closer to the lumbar spine than the right one. To avoid vascular complication, surgeons should identify lumbar spine in the midline and carefully dissect to find out the left CIA. The diameters of aorta and of the CIAs are best fit with the Murray's cubed expression formula, whereas the angle of aortic bifurcation is best fit with 2 times of Murray's angular arterial branching model.

Conclusion: From this study, vascular surgeons can predetermine the diameter and angle of the aortic branching before actual surgical operation on these vessels.

Keywords: Aorta, common iliac artery, lumbopelvic, surgical procedures, vascular

P17: The Effects of Xylene on Mean Tubular Diameter of Distal Convoluted Tubules of Kidney of Female Sprague-Dawley Rats

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Introduction: The challenge that we will face in the next few years is the implementation of cost-effective prevention and management strategies to avoid the xylene toxicity. Thus, investigations of xylene risk factors, toxicity and ways to reduce exposure to these factors are essentials. The purpose of this study was to investigate the toxicity effect of xylene on mean tubular diameter of distal convoluted tubules of kidney of female Sprague-Dawley rats.

Materials and Methods: Twelve 28-day-old female Sprague-Dawley rats were divided into control and xylene groups. The xylene group was administered 8.47 mmol/kg/day of xylene in olive oil vehicle via oral gavage for two weeks. The control group received only olive oil vehicle. The rats were sacrificed and the sections of kidney were stain with periodic acid Schiff's staining. Three fields were selected randomly in the cortex and viewed under microscope under 20x magnification. From each field, ten rounded distal tubules were randomly selected and the tubular diameter were measured.

Results and Discussion: The study found that xylene exposure had significantly reduced the mean tubular diameter of distal convoluted tubules of the rats in the xylene group compared to the rats in the control group. Based on Mann-Whitney test analysis, it was revealed that the difference in mean tubular diameter between control and xylene groups was significant with the p value = 0.009 (Z stat = -2.611).

Conclusion: The xylene has toxic effects on distal convoluted tubules of the kidney that lead to disorganization of distal convoluted tubules due to cellular atrophy.

Keywords: Xylene, mean tubular diameter, periodic acid Schiff's, cellular atrophy

P18: Virtual Histology: Adieu to Glass Slide Microscope?

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Introduction: Digital technology is all pervasive in every realm of human activity. Medical educators are increasingly leveraging digital resources to learn, teach and collaborate more effectively. The aim of the present study was to compare and contrast the effectiveness of virtual histology teaching with traditional glass slide microscopy.

Materials and Methods: All students of I MBBS batch were divided into two groups. Group A was taught histology by the traditional method of didactic lectures followed up with practicals using glass slides of tissues. Group B also attended the same didactic lectures as Group A but were shown only digitised microphotographs. Subsequently, all students were evaluated for their ability to identify tissues using traditional glass slide microscopy.

Results and Discussion: The histology glass slide set in anatomy department was digitised using a high-resolution digital slide scanner. The digital slides could be used in the classroom by using a computer and computer projection system. The digital slide software featured a virtual slide control which could display tissue from magnifications of 1 X up to 40 X in increments of 1 X. The results showed that there was no statistically significant difference in the ability of students to identify tissues with either of the two methods.

Conclusion: Virtual Microscopy is equally effective as teaching histology with traditional glass slide microscopy.

Keywords: Virtual histology, digital microscopy, digital histology

P19: Students' Perception and Effectiveness of Learning Human Structure and Functions II (AHS 1023) through Problem-based Learning (PBL): A Preliminary Study

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Introduction: Anatomy is a prerequisite course for other courses in the health-based programmes. Realizing that basic understanding of anatomy is vital to understand clinical subjects in the later semesters, problem-based learning (PBL) is implemented to supplement the lecture sessions. However, previous studies have showed inconsistent findings on the effectiveness of PBL in teaching and learning anatomy. Thus, the present study aimed to evaluate students' perception and effectiveness of learning the Human Structure and Functions II (AHS 1023) through the PBL.

Materials and Methods: A total of 42 participants were divided into PBL and the non-PBL groups, by using a stratified systematic sampling. All participants were involved in answering the questionnaire, the pre- and post-test following the lecture and practical on the Endocrine System. However, only the PBL group attended the PBL sessions after the pre-test session.

Results and Discussion: The results showed that most of the participants were having a positive perception towards the implementation of PBL in AHS 1023. For the PBL-group, their performance was slightly increased ($p = 0.068$) and significantly higher ($p = 0.002$) than the non-PBL participants, in the post-test. The higher performance in the PBL than non-PBL group was attributed to their ability to answer the medium ($p = 0.002$) and hard ($p = 0.011$) types of questions, suggesting that the PBL may increase the effectiveness of deep learning and thinking process. However, there was no correlation between the positive perception and the performance of participants in the PBL session, the pre- ($r = 0.147$, $p = 0.351$) and post-test ($r = 0.008$, $p = 0.973$).

Conclusion: This implies student's performance is independent of their initial perception towards the course.

Keywords: Problem-based learning, anatomy, perception

P20: Teaching Strategies to Overcome Neurophobia among Medical Undergraduates

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Introduction: Neurophobia is a term used to describe the fear of any topic related to neurology due to failure to integrate basic science knowledge to clinical situation. It has been found that majority of first liner medical staff felt less confident in dealing with patients with neurological illness. This has been linked with their undergraduate experience which has documented high percentage of disinterest to neurological subject due to teaching methods and complexity of the topics. The aim of the study was to discuss on various teaching strategies to overcome this alarming issue.

Materials and Methods: Extensive literature search was conducted on surveys and studies done previously that has looked into the causes and the methods conducted so far, to overcome it.

Results and Discussion: The articles were discussed on various strategies that has been categorised based on curriculum content and methods of teaching and learning. It has been found that, vertical and horizontal integration has been unanimously suggested for curriculum format in medical undergraduate programme. In coherence with IR 4.0 era, there were also various attempts to include multimedia support during teaching and learning sessions which showed promising results.

Conclusion: Neurophobia among medical undergraduate is alarmingly common. Academicians need to be more proactive and creative in dealing with this teaching challenge. A combination of various teaching techniques has proven improvement of students understanding of the topics compared to a single method.

Keywords: Neurophobia, medical education, teaching, neurology, neuroanatomy

P21: Interactive Brachial Plexus Teaching using Gloves and Stockings: Numed Students Experiences

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Introduction: Learning the brachial plexus has posed difficulties for students throughout generations of medical education. The aim of the study is to enhance the teaching of the cutaneous innervation of the brachial plexus to be more engaging and interactive and ensure better retention of information for learners.

Materials and Methods: A qualitative exploratory study was used to explore on students' experience using an interactive way in learning the cutaneous innervation of the brachial plexus. Convenience sampling of Stage 2 medical students were recruited. Wearing gloves and stockings where students drew the cutaneous innervation of brachial plexus on themselves was used as an innovation. Materials used can be recycled for self-study. Free text comments were collected after the session.

Results and Discussion: Several comments include anatomy session is helpful, clear out misunderstandings, link all information together and apply them in clinical skill sessions, apply the knowledge and not blindly memorising, nice study material and session was fun and stimulating. The kinesthetic nature and active participation with the powerful visual images appear to contribute to the value of using gloves and stockings as a helpful teaching exercise for students to understand cutaneous innervation of brachial plexus. The three-dimensional nature of the model as they wear the stockings and gloves also allows for a better understanding of certain intricacies of the plexus.

Conclusion: The use of gloves and stockings enhanced the teaching of the cutaneous innervation of the brachial plexus by making it more engaging, interactive and ensured better retention of information for learners.

Keywords: Brachial plexus, innovation in teaching the brachial plexus, practical classes, students' perspective

P22: Interactive Musculoskeletal Anatomy Teaching using Innovative Coloured Adhesive Tapes: Numed Students Experiences

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Introduction: Anatomy teaching known for its factual knowledge usually leads to rote memorization. Traditional mode of teaching anatomy requires a shift in its teaching approaches to be more student centred and interactive to suit the current 21st century learners. This study aims to enhance musculoskeletal anatomy teaching to be more engaging and interactive for the learners and ensure factual knowledge has better retention

Materials and Methods: Qualitative exploratory study adhered to explore students' experience using the new strategy in learning the anterolateral abdominal walls. Convenience sampling of stage 1 medical students recruited. Free text comments collected from students following completion of practical teaching session. The new intervention was an activity constructing an anterolateral abdominal wall musculature model using coloured adhesive tapes and skeleton.

Results and Discussion: Various comments gathered following their new experience. Better retention on origin and insertion, improved visualization of the origin, insertion and layering of the abdominal muscles, consolidated memory and discussion and working together among groupmates was intellectually stimulating, anatomy session was very interesting, fun and stimulating. Students' comments reveal that their experience improved their understanding, visualisation, and memory on the musculoskeletal anatomy of abdominal walls. In addition, the activity stimulated and encouraged interactive group discussions.

Conclusion: Innovative use of coloured adhesive tapes in constructing musculoskeletal structure activity enhanced the teaching and learning of the students in an engaging and interactive way. Future research should focus on teaching anatomy considering such innovation with active student-engagement to promote effective learning.

Keywords: Anterolateral, abdominal wall, innovative, coloured adhesive tapes, interactive musculoskeletal, teaching, interactive

P23: Anatomy Apps Use in Lecture Promotes Effective Teaching and Learning: Numed Students Experience

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Introduction: Technology enhanced learning (TEL) has become the lexicon of the 21st century pedagogical needs. The current generation are much more engaged when learning is flavoured with technology. Anatomy subject challenges learners to grasp and retain information, intense yet fundamental, in all medical programs. This study aims to integrate technology in anatomy lectures to enhance students' understanding and improved retention.

Materials and Methods: A qualitative study was conducted to explore students' perception on the use of technology, specifically video clips from complete anatomy app, incorporated in lectures. Qualitative data collected was thematically analysed.

Results: Several benefits were discussed with the use of technology in anatomy such as "better visualization", "enjoyable teaching", "easy learning of anatomy", "appreciate integration of technology in anatomy", "enthusiastic to learn", "encourages focus and understanding". Using the complete anatomy application in lectures, showing 2D pictures and following up with 3D video clips, help students to grasp how anatomy of the body looks like and it encourages focus and understanding.

Discussion and Conclusion: Technology use in teaching adds additional mileage to students. Traditional anatomy teaching is good but incorporating 2D and 3D video clips results in positive anatomy learning environment and fits to the current paradigm shift towards teaching and learning. Future studies are needed to explore the use of the application and for the students' performance in examination.

Keywords: Complete Anatomy application, 3D anatomy, 3D video clips, student's perspective

P24: Anatomy Education for Undergraduate: Should We Shift our Paradigm?

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Introduction: Anatomy education is fundamental for medical undergraduates. But there are many issues in anatomy curriculum that require our attention. How much anatomy is enough? What is the best teaching method? Are our teaching contents and methods still relevant in this era? The aim of this study was to determine whether we need to shift our paradigm in anatomy education.

Materials and Methods: A literature review on issues or problem related to anatomy education was performed using the Google Scholar and Scopus databases using certain keywords (anatomy, medical education, outcome based).

Results and Discussion: The ultimate aim of medical schools is to produce safe practitioners of quality. The core knowledge of basic sciences should grant understanding of concepts and application in clinical science. The outcome-based education encouraged a holistic approach, emphasised on achievement of competencies: knowledge, clinical skills, communication skills and professionalism upon graduation. Optimum anatomy knowledge should support competent clinical practise: too detail was unnecessary, compromising too much contents might be dangerous. Teaching anatomy should be in context and vertically integrated to improve students preparedness. No single teaching method is the best: learning strategies should be integrated and effective to develop critical thinking, not just memorising. Technology should be utilised to enhance teaching and learning. The 4IR forced us to focus on values which cannot be replaced by robots and advanced technologies.

Conclusion: We should shift our paradigm in anatomy education. Medical undergraduates do not have to know everything about anatomy, but they should achieve the expected competencies. The anatomy input, learning process and assessment should be re-arranged to accomplish the competencies.

Keywords: Anatomy education, competency, medical, undergraduates

P25: Latex Injection for Vascular Patency: A Modification in Plastination Process

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Introduction: Plastination is one of the techniques in preserving the whole body or body parts in anatomy. Cadavers are embalmed and fixed by using the embalming solution. During plastination, S10 silicone was used during impregnation which caused shrinkage and collapse of the blood vessels. Many techniques were used to maintain the patency of the blood vessels, such as insertion of plastic tube, strings and sticks. However, these techniques caused direct damage to the blood vessels. The study aimed to improve the patency, colouration and visibility of the gastrointestinal tract (GIT) blood vessels through latex injection technique.

Materials and Methods: An adult cadaver was fixed using embalming solution via femoral artery for two hours. Then the cadaver was immersed in 10% formalin for 2-5 weeks. Ammonia solution (25%) was injected and subsequently followed by injection with red latex solution. The cadaver was covered with gauze dipped in formalin for three weeks. The GIT structure from oesophagus until descending colon was removed from the cadaver. The structure was then dissected before the plastination process.

Results and Discussion: The blood vessels of the omentum, mesentery and mesocolon were easily identified by the red colouration. The blood vessels remained patent with soft consistency mimicking the normal structure. There was a minimal degree of shrinkage observed.

Conclusion: Latex injection technique improves the patency and visibility of the blood vessels in the omentum, mesentery and mesocolon. Thus, this technique improves the plastinated GIT specimen.

Keywords: Blood vessels, cadaver, injection, latex, plastination

P26: The Value of Discovering the Efficient Surface Anatomy Teaching Method

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Introduction: Surface anatomy is the study of the external features of the human body meaning not only it is used to identify structures beneath the skin, but it enables the students to perform clinical examinations, interventional procedures and interpret radiological images. Since there is scarce evidence on the best teaching method for surface anatomy, the aim of this study was to justify the need in seeking a prime approach in teaching surface anatomy.

Materials and Methods: A literature search on the importance of learning surface anatomy was performed using Google Scholar and PubMed databases.

Results and Discussion: The declining surface anatomy knowledge in modern curriculum has resulted in procedural and surgical errors. Successful learning of surface anatomy requires a balance between comprehension and visualization. Learners believed that innovative approaches such as body painting, living anatomy model, virtual human dissector and digital X-ray are instrumental in boosting their surface anatomy skills. A study done showed an increase in undergraduate students' understanding of anatomical structures after introduction to ultrasound training as it promoted students' procedural skill and their confidence level on performing clinical procedures. The technique of drawing anatomical structures that requires extra focus of concentration, lateral thinking and knowledge transfer skills could also result in higher understanding of the subject learned. Indeed, integration of surface anatomy in a practical course has resulted in improved knowledge, understanding and confidence level in clinical practice.

Conclusion: Surface anatomy is still relevant to produce safe doctors. Hence, innovation in surface anatomy teaching is pertinent for effective learning and contribute to competent clinical students and doctors.

Keywords: Surface anatomy, anatomy, clinical examination

P27: Deep Learning Approach by Anatomy Spotters: Students' Perspective

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Introduction: Anatomy spotters have been used in the past as an engaging assessment and learning tool, but it has received much criticism for only testing the short-term memory and focused only on surface learning. This preliminary study aimed to evaluate students' feedback on the use of modified anatomy spotters which includes stimulation of higher cognitive levels and relevant clinical application questions to promote deeper learning amongst the medical students.

Materials and Methods: A qualitative exploratory study was performed to assess the students' feedback on the anatomy spotters' session at the end of their standard anatomy practical. Various anatomical models and radiology images were used with different levels of questions based on the Bloom's taxonomy. Selective topics were chosen for stage 1 and 2 medical students and free text comments were collected upon completion of the session.

Results and Discussion: The free text comments indicated that the students felt the spotters helped them to understand the topics in greater detail, stimulated their interest to do further revision and helped them to relate the anatomical structures to relevant clinical applications. Students also selected higher levels of Bloom's taxonomy when asked about their opinion on the overall level of the questions used in the spotters.

Conclusion: Overall, the students valued the anatomy spotters as an important assessment and learning tool that helped them to grasp the new concept, strengthened their memory and stimulated deeper learning. In future, we plan to assess the students' performance and identify the areas of improvements to promote deeper learning.

Keywords: Anatomy spotters, deeper learning, higher cognitive levels, Bloom's taxonomy, formative assessment

P28: Writing a Good Research Manuscript in Anatomy for Publication in High-Impact Factor Journals

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Introduction: Nowadays, it is very difficult to get an acceptance in high-impact factor or in top tier peer-reviewed journals. The quest never ceases and there are lots of rejections to be faced by the authors. There are less trained professionals, to train the youngsters to excel.

Materials and Methods: A search of Pubmed and Google was done. There was certainly, lack of published articles in high impact factor or quartile one journals in the field of anatomy.

Results and Discussion: Any research manuscript may not have in-depth analysis of the research study, and this makes the study very weak. Observations at a molecular level give much strength to the scientific facts. The results obtained through molecular cloning, polymerase chain reaction, macromolecule blotting, microarrays, immunohistochemistry, electron microscopy adds strength to the results. Studies on simple anatomical anomalies and variations in isolated cadavers, may not receive good response in high-impact factor peer-reviewed journals. Admittedly, not many anatomists are trained to write systematic reviews and meta-analysis. This opens the door for anatomists to do have co-researchers from the field of molecular biology. Availability of infrastructure, grants and capability to pay publication charges, are also major concerns for success.

Conclusion: It is not impossible to publish in a high-impact factor journal unless the study has good and new scientific facts, and multiple parameters are reported. The meticulous presentation of facts and appropriate selection of journals even outside the field of anatomy, may be better options. Training by experienced writers and seniors can surely prove to be beneficial.

Keywords: Publish, anatomy, research, high impact, journal

P29: Perception of Online Anatomy Laboratory Tutorial for Year 1 and 2 Medical Students: An Explorative Study

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Introduction: University students are considered adult learners whose learning preferences are generally: self-directed, discussion and competency based. These characteristics influence their acceptance of instructional material and method. Online Anatomy laboratory tutorial (OALT) is an individualized teaching material that students can access anytime so they have flexibility in learning at their own pace, and choose a specific time outside class time to access materials. This study aimed to explore the perception of Year 1 and 2 Medical Students in OALT as adjunct learning tool.

Materials and Methods: A qualitative explorative study was conducted using free text comments from the students to obtain their feedback pertaining to OALT experience. Verbal consent obtained from (n = 280) year 1 and 2 of MBBS programme. All the students were required to do the OALT prior to attending laboratory sessions. The OALT was composed of a series of questions, illustrations and information related to the next laboratory session.

Results and Discussion: Students shared both positive and negative aspect of using OALT. Positive aspects were “useful prior practical anatomy session”; OALT stimulating for learning”; “students encourage online anatomy tutorials”; “well organized” and “difficult but useful to facilitate understanding topics/concepts”. Negative aspect shared was “some are too hard to be self-directed”. Overall, students had a positive experience on the OALT as it is useful, engaging and stimulating in guiding them to prepare for their Anatomy laboratory session.

Conclusion: This OALT as adjunct learning tool in anatomy not only helped the students but gave them the flexibility to address their own learning needs.

Keywords: Online, anatomy, laboratory tutorial, perception, medical students

P30: Medical Students Appreciation on Cadaver Use

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Introduction: The new trend in medical teaching has introduced cadavers substitute like models, plastinated specimens, 3D apps in anatomy teaching. Limited availability of cadavers may have forced to use those alternatives. Most of the conservative medical schools in Asia (e.g. Taiwan, Myanmar, India etc) are still using cadavers while the new schools attempt to abandon that practice. In Malaysia, cadaver use is gradually replaced by advanced technologies. Currently several medical schools are using a combination of both. However, the decision to use or not to use cadavers is solely made by faculty members without any regard on students opinion. It was felt that students outlook on cadaver use in teaching anatomy should be taken into some consideration. This study was conducted in UMS medical school, where cadaver is used in combination with others substitutes, with the objective of discovering students outlook on cadaver use.

Materials and Methods: Self-administered questionnaires were answered by 76 students of year one medical doctor programme FMHS, UMS.

Results and Discussion: A total of 75% of students (male-30.26%, female- 44.74%) favoured cadaver use in anatomy teaching classes. Students responded that anatomy practical with cadavers provided them a feeling of reality. They liked the experience of three-dimensional visual display encoupled with tactile appreciation of human body which cannot be achieved by cadaver-alternatives.

Conclusion: This study highlighted that cadaver usage was much preferred by the medical students. Further exploration of students' outlook should be conducted to incorporate their opinion in curriculum planning.

Keywords: Medical students, cadaver, teaching, questionnaire

P31: Knowledge, Attitude and Practice on Whole Body Donation for Teaching and Learning Purposes: from Bioethics Perspectives

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Introduction: Cadaveric dissection provides as for student to learn the detailed structure of human anatomy. Thus, body donation program is pertinent in ensuring the continuation of dissection class. The objectives of this study were to validate a questionnaire that assesses knowledge, attitude and practice during dissection and to measure the students' knowledge, attitude, and practice on body donation.

Materials and Methods: A cross-sectional study was conducted on 264 undergraduate medical students in B.P. Koirala Institute of Health Sciences, Nepal, who had attended regular dissection classes for one year. Ethical approval was obtained from Institutional Review Committee-IRC/1455/018. A non-probability purposive sampling technique was applied to sample the study subjects. A questionnaire consisting of 32 items was distributed to the students on day-1 and day-15 of intervention and the data was analysed using paired 't' test. A bivariate correlation was done for intra class correlation of each domain and Cronbach's alpha was calculated for each domain.

Results and Discussion: Religion, lack of awareness program, insecurity of being mishandled were found to be main barriers which discouraged for the body donation in future. A total of 98% students claimed that the dissected body need to be handled respectfully to maintain the dignity of person after death. There was positive correlation between attitude and practice ($r = 0.17$, $p < 0.01$), factors affecting practice and attitude were significant ($p < 0.05$) and positively correlated ($r = 0.814$). There was significant relation between knowledge, attitude and practice ($p = 0.018$, 0.004 , 0.000) at 95% C.I. The intra class correlation scores of each domain during test and retest were 0.83, 0.725, 0.710 and correlated significantly ($p < 0.05$). The questionnaire designed was reliable for knowledge, attitude, and practice domain with Cronbach's alpha of 0.63, 0.70, and 0.60, respectively.

Conclusion: Overall knowledge, attitude and practice on body donation was acceptable among the students involved in this study. A validated questionnaire was developed which can be used to collect opinion on whole body donation for academic purposes.

Keywords: Body donation, knowledge, attitude, practice

P32: ASSESSING THE IMPACT OF HUMAN BODY DISSECTION ON STRESS LEVEL OF THE FIRST YEAR UNDERGRADUATE MEDICAL STUDENTS AT BPKIHS

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Introduction: The first exposure to dissection is an unforgettable and important event for medical students. The present study aimed to assess and compare the students' stress level at one week (IES1) and 12 weeks (IES2) post-dissection exposure by using Impact Event Scale (IES).

Material and methods: Questionnaires for Impact Event Scale (IES) were administered to 100 students who attended the cadaveric dissection class at the Department of Human Anatomy, BPKIHS after obtaining institutional ethical clearance. It had 15 items with four-point Likert scale (i.e., "not at all"; "rarely"; "sometimes" and "often") that were scored 0,1,3 and 4, respectively. Apart from overall scale, the questionnaire provided sub scales of intrusion and avoidance. The sub scale score of 0 - 8 indicates a minor reaction; 9-19 a moderate reaction, and a score of 20 and above reflects a clinically important reaction. The cut-off points for overall score of 30 and above indicates a traumatic stress reaction. The IES were administered on two separate occasions between the period of December 2018 to March 2019. Since the data was not in normal distribution, non-parametric tests were applied and were considered significant with Type I error (α) of 0.05.

Results and Discussion: The mean age of participants in the present study was 19.66. The percentage of students with clinically important stress reaction after one week of first cadaveric dissection in both Intrusion and Avoidance sub scales were 2% and 6%, respectively, but was found to be reduced to 1% each after 12 weeks. The overall scores indicating traumatic stress reaction was found to be reduced to 2% from 8%. The bivariate correlation analysis between IES 1 and IES 2 was found to have positive correlation with statistically significant level ($r = 0.252$; $p < 0.001$).

Conclusions: These results suggest that the initial stress associated with human dissection dissipates relatively rapidly.

Keywords: Dissection, impact event scale, intrusion

P33: Behavioural Responses of Anxiety in Aversive and Non-Aversive Conditions between Young and Aged Sprague-Dawley Rats

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Introduction: Measures of anxiety in behavioural tests remain largely unclear even decades after their establishment. Differences in the severity of anxiety measured by anxiety tests are an important issue that must be addressed. We hypothesized that the addition of light as an aversive stimulus to elicit a behavioural change could reflect different degrees of anxiety measured between such tests.

Materials and Methods: The present study compared the responses of aged and young animals between the elevated plus maze (EPM) and the home cage emergence test (HCET) in high aversive bright light and low aversive dim light conditions.

Results and Discussion: In the EPM, bright light conditions induced anxiogenic effects in both animal groups. However, in the HCET, bright light conditions affected only aged animals, who exhibited greater anxiety, increased escape latency, and reduced escape frequency. The correlation analysis showed the escape latency in the HCET was negatively correlated with the time spent and frequency of entry in the open arms of EPM in aged animals in the dim light condition. Interestingly, no correlation of HCET and EPM was found in aged animals in the bright light condition or in young animals in both bright and dim light conditions, which suggests HCET and EPM measure two different entities of anxiety.

Conclusion: The specific behaviours of aged and young animals in the various tests indicate different levels of anxiety are measured by HCET and EPM in aversive and non-aversive environmental conditions.

Keywords: Anxiety, home cage emergence test, elevated plus maze, aged, young

P34: Variations of Circle of Willis: Harmonius Evolution or an Anigmatic Inheritance

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Introduction: Defining the anatomy of Circle of Willis (COW) is more often overcastted by the fact that variations are fairly a rule than a rarity. The flexibility of these variant forms to deal with vascular constrains can only be recognized if professionals dealing such episodes are familiar with prior disposition of the vascular tree in lower animals. Therefore, the aim of this study is to identify the variations found in the COW in North-Eastern India and to interpret the embryological events involved in their formation.

Materials and Methods: The present study included gross dissection of 70 human cadaveric specimens of COW in the Department of Anatomy and the Department of Forensic Medicine at Gauhati Medical College, India.

Results and Discussion: A classical COW was found only in 20% of cadaveric specimens. Variations in anterior circulation were 47.14%. Variant forms were found in 21.42% of the posterior cerebrals and 34.28% of the posterior communicating arteries (PCoA). Unilateral hypoplastic PCoA was found to be the most common variant (18.57%).

Conclusion: While most of the variations observed were interpreted as a mainstream of evolution, some of them might have been a result of altered angiogenesis. Being phylo-genetically more recent, the COW is in a continuous process of evolution along its new developing territories. Whether or not these variations represent intermediate patterns of COW in the process of natural selection for best possible survival of Homo sapiens is a query for further discussion.

Keywords: Circle of Willis, evolution, gross dissection, variations

P35: Anti-Nitric Oxide Activity of *Gracilaria manilaensis* Yamamoto & Trono Extracts in Lipopolysaccharide-stimulated BV2 Microglia

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Introduction: Microglial activation is commonly involved in Alzheimer's, amyotrophic lateral sclerosis and Parkinson's diseases. Lipopolysaccharide (LPS)-stimulated BV2 microglia is a reliable model for anti-neuroinflammatory activity study. *Gracilaria manilaensis* is an agarophyte commonly cultivated in Malaysia which has received increasing attention for its antioxidant and neuroprotective activities.

Materials and Methods: Hot aqueous, methanol and ethanol extracts were prepared from the *G. manilaensis* collected from Kuala Muda, Kedah. BV2 microglia pretreated with extracts for 2 h was stimulated with LPS O55:B5 overnight. Nitric oxide production and cell viability were measured by Griess assay and dimethylthioltetrazolium bromide (MTT) assay respectively. Protein expressions of inflammatory pathways were analysed by the Western blot.

Results and Discussion: Hot aqueous extract did not show anti-nitric oxide activity in LPS-stimulated BV2 microglia. Methanol and ethanol extracts showed significant anti-nitric oxide activity ($p \leq 0.05$) compared to L-nitro- γ -arginine (as positive control) and without interrupting the cell viability, Ethanol extract was selected for protein expression study as it poised the strongest anti-nitric oxide activity. Inducible nitric oxide synthase (iNOS) and cyclooxygenase-2 (COX-2) expressions of LPS-stimulated BV2 microglia was downregulated with no effect on β -actin expression.

Conclusion: The results of present study indicated that ethanol extract has the highest anti- nitric oxide activity which was closely linked with iNOS and COX-2 inhibition. Our current study provided a promising insight of *G. manilaensis* as the reliable source of neuroprotective agent in nutraceutical in the attenuation of neuroinflammation.

Keywords: *Gracilaria manilaensis*, LPS-stimulated BV2 microglia, nitric oxide, inducible nitric oxide synthase, cyclooxygenase-2

P36: Transcorneal Electrical Stimulation Induced Antidepressant-like Effects in S334ter-line-3 Rat Model of Retinal Degeneration

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Introduction: Retinitis pigmentosa (RP) is a retinal degeneration disease and many studies have found that depression is highly associated with patients of RP. Although transcorneal electrical stimulation (TES) has been shown to effectively treat retinal neuropathies, no studies were conducted to investigate the TES-evoked responses in depressive-like behaviours.

Materials and Methods: The 12-week-old male S334ter-line-3 rat model of RP and control animals received 1 week of TES with a range of stimulation parameters (100, 200, and 500 μ A); and animals were tested for depressive-like behaviours. Morphological and electrophysiological studies were conducted to investigate the functional integrity of stimulation-induced neuroprotection effects in this model.

Results and Discussion: In electrophysiology, we found responsive retinal-stimulation-induced neuronal activities in the primary visual cortex (V1) of S334ter-line-3 rats compared to sham animals, indicating that stimulation enhanced neuroprotection on the functional connectivity between retina and V1. In this S334ter-line-3 model, animals demonstrated higher level of anxiety-like responses in the cylinder test, open-field and home-cage emergence tasks; and these anxiogenic-like behaviours were completely abolished after TES treatment. Interestingly, S334ter-line-3 animals with TES showed a remarkable reduction of forced swim immobility, indicating antidepressant-like effects.

Conclusion: Our study demonstrated that TES induced antidepressant-like effects in S334ter-line-3 rat model, and this approach could be a potential therapy for patients suffering from depression.

Keywords: Transcorneal electrical stimulation, retinal degeneration, antidepressant, anxiety, depression

P37: Knowledge in Skeletal Anatomy: An Important Step in Identifying Cremains

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Introduction: Identification of human remains is vital in the forensic case. In the cremated body, the identification of skeletal remains becomes more complex and complicated as the bone change into fragmented and destroyed. The purpose of this study is to examine cremated individuals using bio archaeological methods of analysis to build biological profiles.

Materials and Methods: Urn 169A, a cremation burial from Czerwony Dwór site XXI (Poland), was excavated using mechanical layers (5 cm depth). Foreign objects such as animal bones, stones and artefacts were removed both during excavation and analysis. Following excavation, the cremains were sieved using 10mm, 5mm and 2mm mesh screens. The fragmented remains were identified, and known elements were further divided into anatomical categories within the separated size categories (cranium, torso, upper limb and lower limb). Each category was weighed, and the overall colours of the cremains were described.

Results and Discussion: The analysis indicated that the minimum number of individuals (MNI) of this specimen was two. Biological profile of the urned individuals was a probable older adult and the young child. Age was indicated by presence of diffuse idiopathic skeletal hyperostosis (DISH) in the adult, and the child consisted of two cranial fragments and a femur diaphysis.

Conclusion: In conclusion, the anatomical knowledge of each skeletal element is important in the identification of cremains.

Keywords: Cremains, forensic anthropology, skeletal, bone, identification

P38: Sex Differences of Facial Soft Tissue Thickness Related with Facial Reconstruction

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Introduction: Facial soft tissue thickness (FSTT) is a crucial component which can carry out and determine the virtual face on the facial reconstruction procedure. Previous studies reported that there was an influence of sex on FSTT that affected the virtual face in facial reconstruction. Therefore, the present study aims to examine sex differences of FSTT in a Thai population.

Materials and Methods: The FSTT was measured from a Thai fresh cadaver (8 males, 8 females) that obtained from the Department of Anatomy, Faculty of Medicine, Chiang Mai University. The FSTT was measured at 26 landmarks (10 midline, 16 lateral landmarks) by using the needle puncture technique, and mean values were obtained for male and female in each landmark.

Results and Discussion: There were only 6 landmarks that had significant differences between the mean values of male and female: Pogonion ($p = 0.005$), Right Maxilla ($p = 0.044$), Right Supra M2 ($p = 0.040$), Left Infra M2 ($p = 0.016$), Right Gonion ($p = 0.013$), and Right Border of mandible ($p = 0.031$). Moreover, when considered the mean value of FSTT between males and females, the average thickness values were higher for females, especially in the area of mouth and jaw.

Conclusion: Overall, the mean value of FSTT obtained in this study can be useful for applying in both two- and three-dimensional forensic facial reconstruction purpose. Furthermore, it is necessary to separate the data sets for males and females as well as to collect more samples in the future study.

P39: Determination of Total Length of Humerus from Morphometric Measurement of its Segments in South Indian Population

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Introduction: All humans belong to the species "*Homo Sapiens*" but no two humans are same in their assessable features. The study was done in the South Indian population to derive a regression equation for predicting the length of humerus by using its quantifiable proximal and distal segments.

Materials and Methods: A total of 157 dry humeri (right-83 and left-74) free from any gross defects were collected, measurements from its proximal and distal segments along the vertical and transverse axis taken using electronic digital calliper. Simple linear regression and regression equation for both sides were acquired using SPSS software to ascertain the humeral length.

Results and Discussion: The result showed r-value ranging from 0.095 - 0.781. In total 18 regression equations were generated, 9 for each side of which 5 equations on the right side and 3 on the left side showed statistically significant p-value ($p < 0005$). The values were more positive for the right humerus. The findings were equally closer to the results of studies done in other Indian populations as they belong to same social group, whereas there was a decrease in values compared with the studies done in other foreign countries.

Conclusion: Converting the bone segments to long bone to ascertain the stature of an individual furnish an important information to forensic and anthropological investigators.

Keywords: Humeral fragments, morphometry, regression equation, forensic anthropology

P40: Kelulut Honey Exhibits Comparable Result to Caffeic Acid in Mitigating Metabolic Syndrome Components

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Introduction: Metabolic syndrome (MetS) is an assembly of abdominal obesity, systemic hypertension, insulin resistance, and atherogenic dyslipidaemia. Frequent consumption of mass-produced food with high quantity of fructose and carbohydrates causes an increase in MetS population worldwide. Caffeic acid (CA) is an abundantly found polyphenol and antioxidant in the human diet and is frequently used as a positive control in animal studies. Kelulut honey (KH) produced by *Trigona* spp. bees contains the highest concentration of phenolic compounds among honey products. Our aim was to compare both CA and KH ameliorating effects towards MetS symptoms.

Materials and Methods: A total of 36 male Wistar rats (200-250g) were randomly assigned into 4 groups: Control (C), high carbohydrate and high fructose (HCHF) diet (MS), HCHF diet supplemented with KH and HCHF diet supplemented with Caffeic acid (CA). All groups were kept over a period of 16 weeks. At 0 and 16 weeks, their abdominal circumference, weight, fasting blood glucose (FBS) and blood pressure were measured.

Results and Discussion: CA and KH groups showed a significant reduction ($p < 0.05$) in FBS and systolic blood pressure compared to MS group. CA group also exhibited increase body weight ($P < 0.05$) compared to KH group. There were no other significant differences.

Conclusion: Our studies showed that both CA and KH have comparable potential in mitigating MetS progression. KH supplementation is also seen beneficial in maintaining the body weight. Further studies are needed to uncover their roles in halting the disease process.

Keywords: Metabolic syndrome, caffeic acid, kelulut honey, polyphenol, diet induced disease

P41: Quantification Technique for Analysing Juvenile Sacral Trabecular Microarchitecture: A Micro-CT Scan and Skyscan Analysis Method

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Introduction: The study of trabecular bone provides information relating to bone strength. A number of imaging modalities are used to investigate the internal structure of human trabecular bone, including X-ray macroradiograph, high resolution-CT (HRCT) and micro-computed tomography (micro-CT), with many studies focusing on adult bone analysis, including fracture management and osteoporotic-related bone density. However, only a limited number are investigating trabecular microarchitecture in juvenile bones. The purpose of the current study is to introduce a technique of quantifying trabecular bone parameters in the human juvenile sacrum.

Materials and Methods: Twenty-six individual human S1 sacra spanning the infancy period until eight years of age were examined using micro-CT. The images were then analysed using Skyscan CTAnalyser version 1.11, which provides detailed 3-D quantification of trabecular architecture in a targeted region for specific parameters: (i) bone volume fraction (BV/TV (%)), (ii) trabecular thickness (Tb.Th), (iii) trabecular separation (Tb.Sp), (iv) trabecular number (Tb.N), (v) structural model index (SMI) and (vi) degree of anisotropy (DA).

Result and Discussion: Areas with high-density, plate-like trabecular structure were commonly found in high stress regions of the bone, suggesting that trabecular pattern highly correlates with its mechanical properties. The results demonstrated that in S1, the areas of high stress are located at the medial part of the vertebra, while the lateral part (the auricular areas) exhibited sparse bone density.

Conclusion: The study shows that the sacrum exhibits an early pattern of trabecular bone morphology which is maintained into childhood.

Keywords: Sacrum, trabecular, juvenile, micro-CT scan, skyscan

P42: Comparing the Effect of Nisin ZP on MG63 Osteosarcoma Cell Viability using 2D and 3D Culture Models

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Introduction: Osteosarcoma is highly resistant to chemotherapy, therefore necessitates a novel targeted therapy. A bacteriocin, nisin was reported to possess anticancer properties. In contrast to *in vivo*, cells growing in 2D *in vitro* environment become polarized. In 3D cultures, cancer cells tend to form cell clusters, which make it more difficult for drugs to enter, therefore, represent a more *in vivo*-like environment. This study aimed to compare the effect of nisin ZP on the viability of MG63 osteosarcoma cells cultured in 2D and 3D culture environment.

Materials and Methods: V-Cell G- plates was used for 3D culture study. MG63 osteosarcoma cells were seeded at 4000 and 10000 cells per well of the 96 well plate and V-cell G-plate in 100 μ l of DMEM/F12 & 10% FBS, respectively. The cells were incubated for 24 hours (for 2D culture) and 5 days (for 3D culture) at 37°C; 5% CO₂, then treated with increasing concentrations of nisin ZP for 48 hours. Cell viability was determined by MTS assay.

Results and Discussion: Nisin ZP causes 50% cell death (IC₅₀) at 570 μ g/ml and 800 μ g/ml in the 2D and 3D cultures, respectively. The presence of cell clusters in 3D cultures make the entrance of nisin difficult, thus necessitating higher concentration of nisin.

Conclusion: Optimal dose of nisin ZP is higher in 3D compared to 2D cultures. It raises the importance of using 3D cultures in *in vitro* anticancer studies.

Keywords: Osteosarcoma, MG63, nisin ZP, 3D culture, cell viability

P43: Seed Extract from *Myristica fragrans* (Nuse) on Tight Junction Protein in Cerebral Cortex of Rats: A Preliminary Study

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Introduction: Claudin and occludin are the integral membrane proteins which located at the tight junction (TJ) in several tissues including in the blood-brain-barrier (BBB). Cerebral capillary endothelium and choroid plexus epithelium are important structures in BBB provide homeostasis of the brain and prevent unwanted substance to come into the brain. In a previous study with the same protocol, it was stated that there is a relationship between Nutmeg Seed Extract (NuSE) and the increase in relative expression of PGC-1 as a marker of mitochondrial biogenesis in neuron cells. These findings suggest the increase of PGC-1 contribute to the up-regulation of the expression of the integral protein BBB, claudin, occludin and BDNF as regulators of neuron cell.

Materials and Methods: Rats were randomized into two groups as followed: control group (C) without NuSE (n = 6) and treatment group (T) with NuSE 6 to 8 mg/day, for 12 weeks period via gavage. NuSE were dissolved in distilled water followed administration. This preliminary study used Glucopala caplet to administer NuSE to see the permeability of brain vascular.

Results and Discussion: Relative expression of mRNA BDNF, occludin and claudin increase in (T) group compare with the (C) group was observed. Total mean relative expression mRNA claudin in group (T) was 2.30 ± 0.14 compared to group (C) 2.23 ± 0.05 . Meanwhile, total mean relative expression occludin in group (T) was 2.14 ± 0.11 compared to the group (C) 2.12 ± 0.05 , and also BDNF. However, except occludin, there were no differences in the rate of up-regulation to expression of Tight Junction (TJ) proteins ($p > 0.5$) by statistical analysis.

Conclusion: The long-term feedings of dietary NuSE has potential effect in up-regulating expression of TJ proteins in BBB. Confirmation of these findings in large sample and various biomolecular variable would further support the need to study effect of NuSE in BBB.

Keywords: Seed extract *Myristica fragrans*, occludin, claudin, BDNF

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OP1 - 01

The Effectiveness of Integrated Data in Contributing Towards the Measurement of Key Performance Indicators (KPIs)

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Introduction: Key Performance Indicators (KPIs) are critical measurement of progress.

Toward an intended result.KPIs provide a focus for strategic and operational improvement, create an analytical basis for decision making and assist in measuring performance indicators for staff.

Problem Statement: The current staff performance indicators at the Nuclear Medicine Unit, Department of Biomedical Imaging, University of Malaya Medical Centre does not provide objective evidence of progress measurement in achieving the targeted indicators.

Objective: This study was conducted to analyse and calculate objective evidence of performance indicators for Nuclear Medicine clinical support staff (e.g. Grade U29 and Grade U32 Khas Untuk Penyandang) comprising total productivity and daily tasks efficiency.

Methodology: Retrospective data of examinations performed by staff in Nuclear Medicine Unit from 2018 was extracted from two applications, namely, Radiology Information System (RIS) and Nuclear Medicine Information System (NMIS). The findings were analysed using the Productivity Scorecard and Timestamped Scorecard using Microsoft Excel, which was developed by the team in the unit.

Results: The Productivity Scorecard developed was able to calculate the total annual productivity and measure performance indicators achieved by each staff member in the unit. The Timing Scorecard developed was able to assess the efficiency of time spent for each procedure by staff members based on the indicated time.

Conclusion: It was viewed, the integrated data of scorecards developed are effective tools in measuring the Annual Work Targets / Productivity of staff members in the unit.

OP1 - 02

Factors Associated With the Length of Stay (LOS) of Stroke Patients in Hospital Canselor Tuanku Muhriz, Kuala Lumpur, Malaysia

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Introduction: Globally, stroke continue to become a significant public health issue contributing to one of the major causes of morbidity and mortality in both developed and developing countries. Increasing prevalence of stroke leads to huge economic burden to the patient and their families and society. There are many factors which affect costs of hospitalisations but Length of Stay (LOS) constantly appear to be the main predictors of cost. The aim of the study was to describe the characteristics of stroke patients admitted to a teaching hospital as well as to determine the factors associated with LOS.

Methodology: This cross-sectional study used in-patient's data maintained by the Case-Mix Unit of a teaching hospital from year 2016 to 2017. All patients with ICD-10 code 164 (Stroke, not specified as haemorrhage or infarct) recorded in the Case Mix database were included in the study. Non-parametric tests in the form of Mann-Whitney test and Kruskal-Wallis test were used to determine the significance of association.

Results: The Case Mix database recorded 162 stroke patients from years 2016 to 2017. The age ranged from 31 to 97 years old. While, the minimum and maximum length of stay for stroke patients was 1 day and 17 days, respectively. Severity of illness was found to be significantly associated with LOS ($p < 0.001$). However, age, gender and presence of co-morbidities did not show any significant association.

Conclusion: Despite its limitations, this study is an important first step in examining the characteristics of stroke patients and to determine the factors associated with LOS. This is important so that appropriate steps are taken to identify and address the factors associated with longer LOS. Thus, alleviate the escalating healthcare cost caused by stroke.

Keywords: Stroke, Length of Stay (LOS), factors associated, casemix

OP1 - 03

Cost Analysis on Fixation of Orthodontic Appliances Among Out-Patients in Perlis Orthodontic Specialist Clinic (OSC) Using Activity-Based-Costing (ABC) Method.

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Introduction: Orthodontic treatment is among the dental treatment which is the highest demands especially the teenagers. Malaysian is lucky as the government dental clinic provides as cheap fee as charged or at very minimal charges under Fee Act 2017 for orthodontic treatment. This privilege has long yet not been provided by other countries. With the need for prudent expenditure, oral healthcare planners are obliged to seek evidences based on economic evaluation.

Objective: To determine the provider cost using ABC method for fixation of orthodontic appliances in OSC, Hospital Tuanku Fauziah (HTF), Kangar, Perlis.

Methodology: A cross-sectional study using ABC method was conducted from January to June 2019, involving fixation of orthodontic appliances from OSC in HTF, Perlis. Samples that fulfilled predetermined criteria, total 115 cases, were randomly selected based on malocclusion and patients. Data were analyzed through SPSS version 20.0.

Results: The total provider cost for fixation of orthodontic appliances was estimated about RM486.04. The cost has no significant differences despite patient's malocclusion and types of appliances fixed.

Conclusion: The provider cost determined can be used in planning and annual budgeting, and informing the public that the costs borne by government are not cheap. This finding provides an added value in the evidences on the costing of dental health services in Malaysia.

OP1 - 04

Translation, Cross-Cultural Adaptation and Validation of Hospital Consumer Assessment of Healthcare Providers and Systems (HCAHPS)-Malay Version Questionnaire

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Background: The Hospital Consumer Assessment of Healthcare Providers and Systems (HCAHPS) was developed in 2006 as a standardized instrument to assess patient perception in the USA. The feedback from the patient is an important tool in assessing the quality of the health system. The aim of the study is to translate and validate the HCAHPS questionnaire to assess patient perception of health services.

Methods: The original English version of the HCAHPS was translated into a Malay version based on by an established guideline. The content validation was done involved 10 expert panel including a group of patients. The face validation pre-testing of the HCAHPS-Malay version was carried out with 10 discharge patients. The exploratory factor analysis (EFA) was established from a cross-sectional study conducted among 200 discharge patients from Hospital USM. Exploratory factor analysis was performed using principal axis factor (PAF) with varimax rotation.

Results: The overall content validity index (CVI) was 0.87 and the universal face validity index was 0.82. Meanwhile, from EFA, the factor loading value ranged from 0.652 to 0.961 within 9 domains. The internal consistency reliability based on Cronbach's alpha was 0.844.

Conclusion: The HCAHPS-Malay is a reliable and valid tool based on specific indices, with good construct validity and excellent absolute reliability to determine the patient perception on healthcare services.

Keywords: HCAHPS, Patient perception, Hospital USM

OP1 - 05

Clinical Audit of Timeliness and Automated Cancer Registry Reporting Through UMMC I-Pesakit© Breast Cancer Module

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Big data improves the quality of clinical service by aggregating and mining the large volume of data generated by the electronic medical record (EMR). The i-Pesakit© Breast Cancer Module in UMMC's EMR collects detailed time points such as date of first visit, diagnosis, surgery and treatment to evaluate the quality of breast cancer care and monitor patients in real time. These key points and other clinical data are accumulated at the point-of-care, where the following two-time intervals, (i) time to diagnosis from first visit and (ii) time to surgery from diagnosis, are operationally meaningful measures of quality that are relevant in evaluating the healthcare system. As the main function of i-Pesakit © Breast Cancer Module is to consolidate interdisciplinary data describing patients with breast cancer, an auto-populated Cancer Notification Form was also developed for national cancer registry reporting. Automating this data extraction process reduces human resources and produces more accurate form of reporting. This effective big data workflow management enhances data capture quality in patient care, benefits hospital data monitoring, quality assurance, and registry reporting. Future initiatives include improving i-Pesakit © Breast Cancer Module in filling the data gaps and continuously monitoring breast cancer care and clinical data quality.

OP1 - 06

Tobacco Use among School-Going Adolescents Aged 13-15 Years in Malaysia: Findings from the Tobacco and E-Cigarette Survey Among Malaysian Adolescents (TECMA)

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Introduction: Information on the prevalence of tobacco use among school-going adolescents in Malaysia are scarce. We investigated the prevalence of smoking among lower secondary school students in Malaysia using data from Tobacco and E-Cigarette Survey among Malaysia adolescents (TECMA) survey.

Methodology: The TECMA survey was a cross-sectional study which employed multistage sampling to obtain data from a representative sample of Malaysian adolescents attending secondary school. Data were collected using a validated self-administered questionnaire adopted from the Global Youth Tobacco Survey.

Results: Overall, 27.3% (95% CI: 22.5, 32.7) of the students reported that they had tried tobacco in the past and approximately 1 in 5 of ever smokers reported that they began smoking before the age of 10 years old. A total of 14.8% (95% CI: 14.3, 18.4) reported being current users of tobacco products. In addition, nearly 1 in 10 never smokers were susceptible to initiating smoking in the next year and about 40.2% (95% CI: 35.0, 45.2) of the respondents were exposed to environmental tobacco smoke in their homes and 53.8% (95% CI: 50.2, 57.5) in public places. About three quarters of current smokers wanted to quit smoking. Almost half of the current smokers (50.8%) reported that they were able to buy their own cigarettes without restriction.

Decision: These findings show that the prevalence of smoking in middle school children is moderate in Malaysia.

Conclusion: Smoking among young people is a significant problem. Control efforts should include a focus on stricter anti-smoking policies and tobacco control interventions targeting children from a young age.

Keywords: Tobacco use, Environmental tobacco smoke, school going adolescents, Survey, Questionnaire

OP2 – 01

Quality Improvement Project (MBSR Training to Reduce Burnout, Stress, Anxiety and Depression in Postgraduate Clinical Students)

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Background: Stress and burnout are common among medical doctors. More so for clinical postgraduate trainees with added responsibility to complete their studies on top of daily work demand. The negative implications of stress and burnout is detrimental to doctors' physical and mental health. Consequently, the quality of services to patients and patient safety is at risk. Mindfulness based stress reduction (MBSR) has been shown to reduce stress, depression and anxiety in those who practice it. Current evidence regarding MBSR training is mainly on applying the 8 sessions of weekly training. In view of the challenge of getting postgraduate trainees out of their duties for MBSR training, a shorter training time is needed. Unfortunately, evidence of short MBSR-training is scarce.

Objective: The project implemented a short Mindfulness-based Stress Reduction (s-MBSR) training to decrease burnout, stress, anxiety and depression in postgraduate clinical trainees in primary care.

Methods: The project was conducted in the Primary Care Clinic, University of Malaya Medical Centre in Kuala Lumpur. The postgraduate trainees were randomly divided into intervention group and comparison group. Both groups underwent a session on postgraduate coping skills during their orientation week. The intervention group underwent additional weekly one-hour MBSR training for four weeks. They were taught the principles of mindfulness and ways to practice it. Measurements were taken at baseline (prior to MBSR training) (T0) and one month after completion of the MBSR training (T1) for both groups using Copenhagen Burnout Inventory (CBI) and 21-items Depression, Anxiety and Depression Score (DASS-21).

Results: Thirty-eight doctors (16 intervention; 22 comparison) participated. No significant differences at baseline in both groups for gender, age, years of postgraduate training and past practice of meditation. At one-month follow-up; the intervention group when comparing to comparison group, had significantly lower Personal Burnout score (284 vs 379; $p < 0.05$), Work-related Burnout score (353 vs

427; $p < 0.05$), Client-related Burnout score (270 vs 327; $p = 0.05$) and Stress score (8.50 vs 13.55; $p < 0.05$). No differences were found for Depression and Anxiety score at one-month follow-up.

Conclusion: Mindfulness intervention may provide doctors with skills to manage stress and burnout. Inclusion of such a training program as part of general medical education is likely to benefit all clinical trainees.

OP2 – 02

REHIS: A Dashboard for Rehabilitation Services and Management at Hospital Universiti Sains Malaysia

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Introduction: Until recently, management of patient's appointments, documentations and verbal feedbacks to doctors regarding patient's progression/regression, statistic for different fields were extremely challenging to therapists and rehabilitation managers. Management of Rehabilitation services are intensive and data obtained from multiple sources can facilitate a better rehabilitation management. Therefore, Rehabilitation managers and Centre for Knowledge, Communication and Technology (PPKT), Health Campus Universiti Sains Malaysia (USM) have worked together to develop and evaluate an integrated rehabilitation dashboard known as RehIS.

Method: To develop RehIS, Rehabilitation Medicine Unit has coordinated a team comprising of therapists from Rehabilitation Medicine Unit and Information Technology Officers from PPKT. RehIS integrate all referral system for 3 different divisions in rehabilitation medicine unit; Physiotherapy, Occupational Therapy and Prosthetic and Orthotics. The patients' appointment, compliance to therapy and progress can be viewed by treating physicians online and paperless.

Results and Discussion: This dashboard successfully provides a big range of rehabilitation data consist of total of patients being referred to the Unit, number of new cases in different field/disciplines and defaulted cases. Furthermore, it also assists rehabilitation manager in allocating therapists based on data provided and monitor progression of patients referred to Rehabilitation Services. This data also can help Hospital USM for further research such as norm and population of certain cases in Kelantan. This unique system optimized the management of the big range of statistical data in different services provided by the Rehabilitation Medicine Unit.

Conclusion: RehIS System develop by Rehabilitation Medicine Unit and PPKT USM is efficient, user-centric, cost and time saving and provides online and written feedback to doctors. It improves communication between therapist/technician with doctors and significantly improved quality of management of services and resources by the Rehabilitation teams at Hospital USM.

Keywords: Rehabilitation, Telemedicine; Referral system.

OP2 – 03

Improving the Screening Process for Federal Pensioners at PHARMUMMC

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Selection of Opportunities for Improvement:

PharmUMMC is a retail pharmacy in UMMC that supplies special formulary (SF) medicines which are charged at full cost to all patients. Federal pensioners who are prescribed with SF medicines can apply for fully subsidized medicines from UMMC if the conditions are met. However, the work process for processing such applications and supplying medicines to the pensioners are complicated, lengthy and time as well as paper consuming.

Key Measures for Improvement:

- Screening process time for pensioners over the counter
- Number of footsteps taken by the screeners
- Usage of paper in manual process

Process of Gathering Information:

Prospective data collection in June 2018 was carried out via observing the screening process to:

- i. record the time spent screening for pensioners versus paying patients over the counter
- ii. record the number of footsteps taken by the screener as they leave to make copies and manually check the patients' records.

The usage of paper used from June 2017 to April 2018 was weighted and the tree calculator was used to determine the number of tree used with the paper consumption.

Analysis and Interpretation:

- i. A total of 153 pensioners were observed in June 2018. Average time spent for a pensioner during screening process is 2.8 minutes compared to 1 minute for a paying patient. With an average of 100 pensioners/day, screening process for this group of patients takes 4.7 hours/day.
- ii. Screeners have to take an average of eight footsteps upon carrying out manual process, which translates to about 800 steps/day compared to none for paying patients.

iii. A total of 236kg of paper was used, which translate to usage of 6 trees for the 47,000 paper sheets used.

Strategies for Change:

The lengthy screening time is contributed by the time consuming search for prescription by the group of pensioners who tend to have multiple hospital documents with them, followed by the manual search for the patient's application history. An online database was created – the AP checker – to facilitate the record search. The original prescription is photocopied on a yellow paper to improve visibility and reduce searching time. Internal circular by the Chief of Pharmacists were issued to inform all staff across the department of Pharmacy that yellow prescription is solely for PharmUMMC. Both the AP checker and yellow prescription helps to reduce the paper consumption

OP2 – 04

Applicability of Text Mining in Narrative Breast Radiology Reporting for Clinical and Research in University Malaya Medical Center

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The written radiology report is a formal documentation which constitutes of the summary of findings and impressions of a radiologic procedure. Traditional way of documenting and storing radiology reports is tedious and redundant which may pose great limitation in mining these textual data for audit and research purposes. The problems encountered by academic radiologists in training report writing can be solved by summarising reports generated by text mining that can be stored in a structured format after validation by the reporting radiologist. The aim of this study is to develop a radiology reporting system that will structure narrative breast radiology reporting using text mining for information extraction in the clinical and research settings. The dataset used in this study comprised of 147 ultrasound and mammogram reports of breast cancer patients provided by the Department of Biomedical Imaging, University Malaya Medical Center (UMMC) in free text format. Data cleaning was performed to remove duplicates. Relevant keywords were decided upon multiple close communications with radiologists and clinicians to ensure contextual accuracy. A text miner was then designed and implemented using R programming, based on a rule based approach. Finally, a web based front end was developed using PHP, HTML and Javascript to insert new reports or view existing reports. The entire architecture was built on a XAMPP platform integrated with MySQL for backend data storage. The system was evaluated by calculating the precision, recall and F1-score using confusion matrix. 21 important variables in narrative radiology reports were successfully mined from free text into a structured format. The evaluation of the system using a training set data showed 0.97 of precision, 0.99 of recall and 0.9804 of F1-score calculated using the confusion matrix. Comparison with radiologist reporting yielded 96% accuracy based on 147 reports and 1146 parameters. The text mining algorithm developed and tested

in this study, although was highly accurate and correlated to radiologist needs, a validation step of radiologist sign-off is required for clinical legal defense. Thus, the reporting system has to be enabled to view, enter new data and update before submitting as a complete radiology report for primary radiology record keeping as well as for research purposes. The study presented here is very significant in the landscape of radiology and healthcare as turning unstructured data into structured form may reveal useful insights by employing artificial intelligence and big data tools.

OP2 – 05

Development of Nursing Cost and Service Weights for Inpatient Using Casemix System in Hospital Canselor Tuanku Muhriz Universiti Kebangsaan Malaysia

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Introduction: Nurses are the major contributors to hospital services for inpatient care. Due to their high operating costs and high labor cost in the hospital, the nursing cost has been measured in several countries worldwide but not in Malaysia's healthcare settings. Hence, this study aims to develop the nursing costs and nursing service weights for inpatients in Hospital Canselor Tuanku Muhriz UKM (HCTM).

Methods: This is a health economic evaluation study using a descriptive cross-sectional design. The samples were obtained from the Casemix system database for inpatients and were grouped using Malaysia diagnosis related group (MY-DRG®). The hospital costing methods for this study used a combination of Top-down costing and Activity based costing. The hospital costing data were obtained from five departments including Finance, Human Resource, Nursing Management, Maintenance and Health Information department HCTM. The costing data were trimmed using a low trim point and high trim point method to handle the outliers. Two methods of calculation that are used to develop the nursing cost and nursing service weights (NSW) that are nursing hours and unit cost of nursing per patient per day of stay.

Result: The cases were grouped into 704 MY-DRG® comprising 85,042 discharges. Majority of inpatients treated in HCTM were from medical (58%; 49,353/85,042), followed by surgery (22%; 18,767/85,042), obstetrics & gynaecology (19%; 15,985/85,042) and the least case type was from the paediatrics discipline (1%; 937/85,042). The highest nursing cost and NSW for this study was MY-DRG® G-1-11-III (Ventricular shunt – major: MYR9,694; NSW 7.8880).

Conclusion: The results showed that both costing methods are feasible to use in the development of nursing cost and nursing service weights. The used of nursing hours in the calculation of nursing cost tends to give higher nursing cost and NSW

compared to the cost per patient per day of stay. The higher nursing service weights reflect the higher nursing resources consumption for the particular MY-DRG®. By highlighting the nursing costs for inpatient care, the impact of nursing care becomes evident, allowing for appropriate reimbursement for the hospital.

OP2 – 06

Improving the Competency of Triage Officer in the Primary Care Clinic, UMMC (RUKA)

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Selection of Opportunities for Improvement:

Triage is an important step in ensuring patient is seen by the right health care provider at the right place and timing. The staff nurses in Primary Care Clinic, UMMC (RUKA) play an important role as the front liner to triage all the patients visiting RUKA clinic appropriately. RUKA clinic has an existing triage guideline developed in the year 2017. We included the important criteria for assessing the patient's clinical presentation and vital signs at triage counter. Prior to this, staff nurses were using informal, unwritten rules that were established on a daily basis. After introducing the written guideline, our initial audit found that there were many cases that were still under triage. Triage chart reviews in June 2018 showed a total of 20 cases was deemed to be under triage. Under triage patients have an increased potential for poor outcomes due to a lengthier waiting room stay, which results in delay of care. The purpose of the process improvement initiative was to improve the number of under triage patients and improving the triage skill and knowledge by conducting an intensive triage training workshop for the RUKA staff nurses and medical attendants. We developed a RUKA triage training workshop based on the existing RUKA triage guideline and Emergency Screening Index tool.

Strategies for Improvement:

An intensive triage training workshop was designed based on RUKA clinic triage guideline and Emergency Severity Index tool for all the RUKA staff nurses and medical attendants. The workshop was conducted in July 2018.

Key Measures for Improvement:

Improvement of the RUKA staff nurses knowledge and competency after the triage training workshop

Reduction in the number of under triage patient after the triage training workshop

Process of Gathering Information:

Project procedures consisted of pre- and post-triage training workshop knowledge and competency score assessment using clinical vignettes.

Triage chart reviews were performed for one month during pre- and post-triage training workshop.

Effect of Change:

A total of 21 staff nurses and medical attendant attended the 2 hours triage training workshop conducted in July 2018. The participants were given a set of questionnaire with 10 clinical vignettes to assess their knowledge and competency to triage the patients. Pre-test knowledge score was poor (less than 5) with the mean score of 3.90 ± 1.9 . There was significant improvement of the knowledge score immediately after the triage training workshop with the mean score of 5.76 ± 1.7 ($p < 0.001$). The triage chart review showed a total of 5 cases was deemed to be under triage one month after the triage training workshop (August 2018).

Conclusion:

Intensive triage training workshop shown to increase the RUKA staff nurses and medical attendant knowledge and competency of triage categorization. This reduces the number of under triage patient in RUKA, thus leading to a decreased risk of poor patient outcomes.

The Next Step:

To include triage training workshop as part of the continuing nursing education for staff nurses in the Primary Care Clinic, UMMC (RUKA).

OP2 – 07

Public Attitudes Towards Tax Increment of Tobacco Products in Malaysia and its Associated Factors: Findings from the Global Adult Tobacco Survey, Malaysia (GATS-M)

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Objectives: The strict tobacco taxation is an effective regulatory approach in encouraging smokers to quit at the same time prevents smoking initiation among the youth. It adds value in limiting the public health impacts secondary to tobacco use. The survey on the public attitude towards tax increment aligns with the government agenda closer to community preferences. This study aimed to determine the public opinion on tax increment on tobacco products and its associated factors among Malaysian adults.

Methodology: Data was derived from the nationwide study of Global Adult Tobacco Survey, Malaysia (GATS-M) which employed a multi-stage proportionate to size sampling method to select a representative sample of 5112 Malaysian adults aged 15 years and above. The validated questionnaire adapted from GATS was utilized as study tool. The data was analyzed with SPSS Version 20, employing cross tabulation and Multivariable Logistic Regression to identify factors associated with support for tax increment of tobacco products.

Results: More than two-third (70.1%, 95CI 68.2-71.9) of the respondents supported the tax increment of tobacco products. The level of public support were significantly higher among female (81.8%, 95CI 79.6-83.8), respondents with tertiary education attainment (79.7%, 95CI 74.6-83.4), government servants (79.5%, 95CI 74.0-83.6), non-smoker (81.8%, 95CI 79.4-83.0) and those without second-hand-smoke exposure neither at home (73.4%, 95CI 69.7- 77.1) nor at work (78.8%, 95CI 74.7-81.5). Multivariable logistic regression further substantiated that government servants and nonsmokers were more likely to support tobacco taxation in Malaysia, with the adjusted odd ratio of 4.78 (95CI 4.33-5.29) and 4.03 (95CI 1.70-9.57) respectively.

Conclusion: Our study demonstrated that majority of the Malaysian adults were in favor of tax increment for tobacco products. The support level were higher especially among government servants and nonsmoker, therefore, this public opinion served as an important guide ahead of the future action of government on tobacco control policies in Malaysia.

OP2 – 08

Quality of Life Among Breast Cancer Patients

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Introduction: Breast cancer (BC) is the fifth leading cause of cancer-related death worldwide. The loss of health due to the BC and/or its related treatment may affect health-related quality of life (QoL). This study aims to describe the QoL and to determine its associated factors among BC patients.

Methodology: A cross-sectional study was conducted among 194 randomly-selected patients diagnosed with BC at three government-funded health institutions. The QoL was measured by using the validated self-reported EuroQol Five-Dimension Five-Level (EQ-5D-5L) instrument.

Results: The response rate was 97% (n=194). Majority were Malay (61.9%) and married (90.7%) with mean age of 54 (SD=10.6) years. Most of them were B40 group (77.8%) and have no insurance coverage (83%). Majority had no family history of BC (60.8%) and currently in stage 3 BC (50.5%). Participants had undergone surgery (91.8%), chemotherapy (76.8%) and radiotherapy (8.2%). Overall the participants had a mean EQ-5D-5L utility score of 0.825 (SD=0.21). Pain/discomfort (31.4%), and was major concern of the participants followed by anxiety/depression (30.4%), usual activity (22.7%), mobility (19.6%) and self-care (9.3%). Multivariable analysis found that those Malay currently working, late stage of breast cancer and combined treatment modality were significantly had low EQ-5D-5L.

Conclusion: Patients with BC have poor health-related QoL with pain/discomfort as the most frequently reported problems and it was significantly associated with current working status, stage and treatment of BC.

OP2 – 09

NICE: A Data-Driven Dashboard Analytics for the Management of Care at the Hospital Universiti Sains Malaysia (HUSM)

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Introduction: Management of care at hospital is intensive. Using data obtained from multiple sources can facilitate this management. This so-called Data-Driven Decision Management is possible with the use of information technology. In view of that, the HUSM nursing unit, the Centre for Knowledge, Communication and Technology (PPKT) and clinicians have worked to develop and evaluate an integrated real-time data-driven dashboard analytics known as NICE.

Methods: To develop NICE, HUSM has coordinated a team comprising of nurses from HUSM nursing unit, information technology officers from PPKT and clinicians. NICE uses the framework based on the Microsoft Power BI software. It is deployed on Microsoft Office 365 SharePoint. NICE is available of the phone, tablet and computer and retrieves data at real-time from HUSM record office and HUSM nursing information system.

Results and Discussion: NICE dashboard analytics successfully provides real-time data and enables nursing team to continuous monitor resources at HUSM on the phone, tablet or computer. The information from NICE system enables the nursing team to allocate resources such nurses placement based on demand, monitor locations of equipment and supply at each ward at any point given time. NICE speeds up the time for nursing team to respond to demand, reduces error, stress and is more convenient than the older system.

Conclusion: The NICE dashboard analytics system developed by the HUSM is efficient, user-centric and provides real-time feedback. This data-driven analytics system has significantly improved the quality of management of resources by the nursing team at HUSM.

OP2 – 10

Assessing Responsiveness of the Reporting Process for Statutory Notification in Selayang Hospital

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Introduction: Infectious diseases account for one of the top 10 principal causes of hospitalization in the public hospital in Malaysia for the last decade. The Objective of this study was to assess the responsiveness of the reporting process for the notifiable disease at Selayang Hospital from 2013 to 2018.

Methodology: This was a descriptive cross-sectional study-design, utilized both quantitative and qualitative approaches. In quantitative, all notified cases identified from hospital notification database that fulfilled the inclusion and exclusion criteria were included in the study. In qualitative, volunteered doctors from various clinical departments were recruited to participate in focus group discussion (FGD). Simple descriptive statistics including binary logistic regression and thematic analyses were used to analyse data collected for quantitative and qualitative approaches respectively.

Results: There had been two-fold increase of notification for last 6 years with overall responsiveness rate of 92%. Among 25 diseases being notified. Viral Hepatitis has the highest average length of delay account for 24.7 days (± 61.2 SD). Factors like the busy working environment, and too many information needed to fill in the form, were identified as the constraining factors for statutory notification process during FGD.

Discussion: Uncommon diseases fall under 7-days notification were mostly attributed to the chronic stage which often be regarded as non-urgent to be notified.

Conclusion: This study recommended that policy need to be communicated and to undergo continuous adaptation like implementing online notification to improve and enhance the notification process quality.

Keywords: Selayang Hospital, Statutory Notification, Communicable Disease

PP - 01

The Effectiveness of Big Data Analytics in Human Resource Management for Teaching Hospitals: A Case Study in UMMC

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Big data analytics is the process of examining large data sets with a variety of data formats to uncover useful information for business decision making. Big Data Analytics in human resource management is commonly known as people analytics. The collected people data is essential in solving operational and business issues. It usually refers to the use of many data sources to evaluate and enhance practices including but not limited to employee performance, training and development, recruitment, talent management and overall business performance.

The big pool of data can be very useful especially in assessing employee productivity, the impact of training on employee performance, interest area of employees based on performance, and more. This could help the human resource manager to make more accurate decisions and recruit top talent for the future. A good human resource management is a big advantage in ensuring sustainable development of a business.

University Malaya Medical Centre (UMMC) was previously recruiting staff based on academic qualification rather than their talent and interest. This is a faulty approach that has been practiced for decades in Malaysia which does not really portray one's potential, especially in civil sector. The problem with this approach is that, staffs are evaluated based on their academic background, leaving them chances to work only for specific job without knowing their best ability. In a long term, employees will be losing motivation and no longer performance-driven. UMMC is currently assessing the potential of an employee not just by their academic qualification. Talent and interest are also well-thought-out as key factors in enhancing work performance and moreover, placing the right person at the right place. Rationally, this approach does help in encouraging staff to work stress-free based on their interest. Hence, improving individual work performance and reducing disciplinary issues due to demotivation.

This area is evolving with many benefits it has to offer. Teaching hospitals in Malaysia as a whole should see the potential of this approach and work hand-in-hand in enhancing human resource management to grow together and lead the medical education in Malaysia.

PP – 02

CKD Nurse Educator Outcome in a Tertiary Teaching Hospital

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Introduction: Preparation for long term RRT encompasses patients with well-decided options, well-prepared access and elective initiation of therapy with matured functioning accesses. To study the effectiveness of CKD & Pre-Dialysis Education given by CKD Nurse Educators in preparing patients with Stage 5 CKD for long term Renal Replacement Therapy (RRT).

Methods: This is a retrospective study that included all Stage V CKD patients who had attended the CKD Nurse Educator teaching sessions at a tertiary teaching hospital from January 2017 to December 2018. Patients' demographic details, causes of CKD and co-morbidities were documented. The clinical outcomes were the informed RRT decisions and access at dialysis initiation

Results: Out of 320 patients attending CKD Nurse Educator teaching sessions in 2017-2018, 142 (44.4%) were females with median age of 40 to 70. 151 (47.1%) were malays, 145 (45.3%) were Chinese and 24 (7.5%) were Indians. 193 (60.3%) were Diabetes Mellitus, 110 (34.3%) were Hypertensive while the balance were multifactorial. From the cases referred, 210 (65.6%) deciding for HD, 20 (6.25%) deciding for CAPD, 3(0.94%) Palliative and only 2(0.63%) for Pre-emptive transplant. 85 (26.3%) are still undecided on RRT options. Out of the 160 patients who were initiated on RRT, for HD , 147 (92%) were initiated via temporary dialysis catheters whilst only 8 (5%) used a mature arteriovenous fistula and 5(3%) initiated peritoneal dialysis with a Tenckhoff catheter. In maintaining haemoglobin levels, 213(66.5%) were prescribed with Erythropoietin therapy while the remaining 54 (16.8%) were prescribed with hematenics and 53 (16.5%) were in close monitoring of HB levels.

Conclusion: Pre-Dialysis and CKD Education has paved the way for a more practical approach towards a more structured long term RRT planning. This is reckon through the total numbers of patients attending CKD Nurse Educator's session and proceeding with the directions of plan base on individualised treatments plans. It is observed that a significant number of patients were initiated on dialysis using dialysis catheters. The underlying reasons being that majority of the declining eGFR of patients were unable to withstand the duration of access maturation causing urgent initiation of RRT despite a maturing access. The current practice of early referrals to CKD Nurse Educators for prompt planning and preparation should be adopted.

PP – 03

Drug Utilization Review in Patients Who Had Fall Incidents at a Teaching Hospital

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Background: The most common problem of injury in older patients is falling. There are around 50% of old age people experiences fall and results in minor injuries such as bruises, abrasions, laceration; and around 10% of all falls causes major injuries including intracranial injuries and fractures. Drugs play a major role in fall incidents and some class of drugs affects patients' mental and postural stability. Hence, a study was aimed to review the drugs prescribed in older patients with at least one episode of fall incidents.

Method: A retrospective study was carried out at a 1000 bedded teaching hospital using electronic big data system to record patients' information. Statistical calculations were made on the collected data for the number of fall, severity, drugs offended, management and outcome of fall.

Results: Among the 135 patients admitted for treatment, 69 were male and 66 were female. Almost 57% (n=77) of the population are older than 60 years of age and have had at least one co-morbid conditions. Many of fall incidents have occurred during their inpatient period and at the time of using toilets and at bedside. Most (42%) of the fall incidents were moderate to severe and sadly one patient died due to large subdural hematoma and intra-parenchymal bleeding secondary to fall. Corticosteroids (36%), diuretics (27%), antihypertensives (26%), antidiabetics (25%) and other class of drugs (45%) were commonly prescribed in the patients, these drugs are given either alone or in combination with other drugs. These drugs have high impact on fall incidents as it may lower the blood volume, blood pressure and blood sugar; and it may in turn cause postural instability. Most of the fall incidents (64%) where noticed in patients who had diuretics plus antihypertensives (26%), antihypertensives plus antidiabetics (22%), antihypertensives plus antidiabetics plus antihyperlipidemic agents (18%) and corticosteroids (15%) concurrently and at irregular dosing interval.

Conclusion: Close monitoring of prescription drugs and its complications are of at most important to prevent future fall incidents. Hence, a structured medication review is warranted in an emergency basis to make the drugs safer to the patients.

PP – 04

Implementation of Paperless Routine QC Forms

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Selection of Opportunities for Improvement:

1. To eliminate manual recording of daily QC data and reduce paper usage
2. To increase efficiency and effectiveness of routine QC
3. To provide visibility and monitor an input of QC data in real time
4. To have an organize data storage of QC results

Key Measures for Improvement:

Number of forms that have been filled in a day.

Process of Gathering Information:

Retrospective data collection of number of filled QC forms by Radiographer at Digital Radiography examination rooms between January to December 2018.

Analysis and Interpretation:

Data collection showed one hundred and sixty eight (168) papers have been used to print QC forms in 2018.

Strategies for Change:

To convert the current QC forms to an electronic format and provide a structured instruction to user.

Effect of Change:

1. Decrease printed QC forms in paper by 50 percent.
2. 100 percent efficient and effective of data input in electronic QC forms
3. Full-fledged performance monitoring of QC data by physicists
4. Zero physical storage needed to keep the QC forms

The Next Step:

To extend implementation of digital QC forms to other modalities such as Computed Tomography (CT) Scan, Magnetic Resonance Imaging (MRI), Angiography, Ultrasound and Mammography.

PP – 05

Leak Test of Radiation Protective Equipment (RPE)

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Selection of Opportunities for Improvement:

1. To inspect lead aprons/thyroid shield/gonad shield/ovarian shield/goggle for damage to comply with the requirements of hospital accrediting organizations.
2. To detect a leak/breach in the internal matrix of lead aprons/thyroid shield/gonad shield/ovarian shield/goggle
3. To eliminate the misused of RPE at workplace.
4. To increase effectiveness of training or briefing on the care of RPE .
5. To have an organize data compilation of RPE integrity results.

Key Measures for Improvement:

1. Inventory assets and updates of RPE at workplace.
2. Schedule of RPE testing periodically .
3. The method of monitoring the usage of RPE.

Process of Gathering Information:

- i. Retrospective data collection on the number of RPE tested and stored at workplace for routine usage.
- ii. Number of RPE rejected in a year .
- iii. Frequency of inspection base on time schedule.

Analysis and Interpretation:

Data collection on the total of existing RPE , new supply and rejected from 2014 till 2018. Survey on the frequency of testing , safe care briefing and inspection on RPE at workplace .

Strategies for Change:

- i. To maintain the integrity of RPE condition and increase awareness of safe care on RPE at workplace.
- ii. To improve the tracking system of RPE assets using software.

Effect of Change:

1. Decrease rejection of RPE in a year by 90 percent.
2. 100 percent efficient and effective of tracking RPE asset using electronic system.
3. Full-fledged performance monitoring of rejected data by physicists

The Next Step:

To extend implementation of rejection control on RPE assets to other healthcare institutions using irradiating apparatus and radioactive source in their healthcare services.

PP – 06

Improving the Process of Data Management of Unmarried Mother Cases at the Department of Medical Social Work (DMSW), University Malaya Medical Centre (UMMC), Kuala Lumpur

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Background: The rapid growth of economic and industrial development in Malaysia is not in line with human development, looking at the perspectives of adolescents and youth social problems in the country. Out of wedlock pregnancies are one of the issues referred to the Department of Medical Social Work (DMSW), University Malaya Medical Centre. Increased number of cases throughout the years remain challenge to healthcare providers including hospital social workers. DMSW is fully committed to assist individuals referred as unmarried mothers.

Justification: Data collection through non-standard interview sessions has its own disadvantage especially in term of information variation, records and documentation. This project will focus to improve on guided developed questionnaires which consist on opinions of different specialities to ensure standardized, consistent and competence interviews among the officers at the DMSW.

Objective: The proposed quality improvement project is to improve on the data management process at the DMSW in term of data collection, record writing and documentation.

Measurement: The project use a guided questionnaire created using specific social parameters.

Methods: All cases of unmarried mothers referred by the doctor are interviewed and managed according to the proposed guidelines. Data prior to this project will be obtained and compared with the post-project data using the guided questionnaire.

Duration: The project had been ongoing from April 2019 and is expected to complete by September 2019.

Expected Results :

1. The quality of the interview sessions will be improved.
2. Issues of variability of information, records and documentation will be resolved.
3. The discrepancy between the data collected from interviews and the data recorded will be minimized.

PP – 07

Risk Reduction on Staff Exposure for Handling Unknown Radioactive Patient

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Selection of Opportunities for Improvement:

1. To control unnecessary radiation exposure to staff public and environment from unknown radiation in compliance with regulation.
2. To enable staff determine an optimum action to handle the situation without relying on third party/outsource.
3. To have an accessible systematic module for radiation detection and constructed command.

Key Measures for Improvement:

1. Radiation exposure awareness among staff from different profession.
2. Radiation detection from unknown source.
3. Established hierarchy of command related to coordination of the exposure situation.

Process of Gathering Information:

1. Report of radioactive patient arrival at any clinic to radiation safety personnel .
2. Investigation on action done following the establish instructions by radiation protection officer. (RPO)

Analysis and Interpretation:

1. Report of radiation exposure and occupancy involves at initial process.
2. To observe the steps taken accordance to the established work instruction.
3. No details information regarding current report in e-document.
4. Time constrained for patient to be isolated from public.

Strategies for Change:

1. Established a suitable internal hierarchy of command on handling radioactive patient at arrival counter .
2. Awareness of handling the radiation hazard according to the type of radiation exposure risk.

Effect of Change:

1. Radioactive patient is handled by non-radiation worker staff without having any fear about the radiation exposure limit.
2. The principle of controlling the radiation external exposure is used efficiently among staff.
3. Early detection of the unknown radioactive patient.
4. Obtained a real time data and detail information directly from e-document

(patient folder).

5. Radiation monitoring to radioactive patient can be done from according to the risk level.

The Next Step:

1. To ensure the personnel incharge of radiation monitoring can access to e-document system for easier action and proper communication platform with other healthcare practitioner.
2. To ensure the radiation exposure is well control among staff .
3. To ensure the related authority receive a proper report of incident in compliance with regulations

PP – 08

Safe Design Concept For Radioactive Waste Disposal in UMMC.

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Selection of Opportunities for Improvement:

1. To control radioactive waste disposal in compliance with regulation.
2. To enable radioactive waste disposal without relying on third party/outsource.
3. To have an accessible system for radiation monitoring and waste surveillance.

Key Measures for Improvement:

1. Radiation exposure readings of radioactive waste before disposal.
2. Scheduled radioactive waste disposal.
3. Established data of information on disposal.

Process of Gathering Information:

1. Radioactive waste disposal and radiation exposure monitoring has been done manually.

Analysis and Interpretation:

1. Manual monitoring of radiation exposure and waste disposal is a time-consuming process.
2. Manual radioactive waste disposal gives radiation exposure to staff and contractor.
3. No details information regarding current situation in septic tank.
4. Time constrained for waste disposal due to maintenance service contract.

Strategies for Change:

1. Established a stable SCADA system for radioactive septic tank.

Effect of Change:

1. Radioactive waste is within the radiation exposure limit before disposal.
2. Reduce time and cost for monitoring and disposal activity.
3. Early detection of any issue or problem in radioactive septic tank.
4. Obtained a real time data and detail information directly to computer.
5. Surveillance and disposal of radioactive waste can be done from the system.

The Next Step:

1. To ensure the SCADA system is connected through local area network (LAN) for easier maintenance of system.
2. To ensure SCADA system is stable for a long time period.

PP – 09

Cost-Effectiveness and Cost-Utility Analysis of Colorectal Cancer Genetic Testing: A Study Protocol

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Introduction: Colorectal cancer (CRC) remains the second leading cause of cancer related death in the world. Approximately 3–5% of CRC are associated with hereditary cancer syndromes. Individuals who harbour germ line mutations are at an increased risk of developing early onset CRC as well as extra colonic tumours. Genetic testing can identify these genes that cause these colon cancer syndromes. Early detection will lead to provide targeted prevention strategies and surveillance for the CRC patients and their family. Hence, this study aim to determine cost-effectiveness analysis of CRC genetic testing.

Methods and design: This study will use cross-sectional design in order to determine the cost-effectiveness and cost-utility analysis of CRC genetic testing in comparison with the usual screening method of CRC from the provider's perspective. Measures on effectiveness and costs of both interventions will be obtained by simple random sampling in 3 general hospital, enrolling 256 patients between 18 and 85 years old with a diagnosis of CRC. Effectiveness measures are: CRC case prevented and CRC death prevented. Utility measures will be calculated from the EQ-5D-5L. The analysis will be performed from a provider perspective. The cost-effectiveness analysis will be conducted with a Markov model.

Ethics and dissemination: Ethical approval was obtained through all participating hospitals. Results will be disseminated through peer-reviewed publications and scientific presentations. Results of the cost-effectiveness and cost-utility of CRC genetic testing will also be disseminated to the National University of Malaysia.

Conclusion: We hope to demonstrate the cost-effectiveness and cost-utility of CRC genetic testing, see an improvement in the patients' quality of life and be able to report a decrease in the costs. If the intervention is cost-effectiveness and cost-utility, it could be applied to CRC screening program.

PP – 10

Patient Safety Attitude among Healthcare Workers : A Systematic Review

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Introduction: Good patient safety culture in healthcare facilities are indicated by the better the patient safety attitude among the healthcare providers. A safe culture that is targeted at reducing errors can be further engineered into daily work practices. By improving safety culture in healthcare facilities, medical error will be reduced, the better outcomes of treatment served to patients and more resources will be saved.

Methods: Electronic searches was performed using the two search engines which are Ovid and PubMed by using specific keywords related to assessment, patient safety attitude and healthcare providers. We included studies that were using Safety Attitude Questionnaire as an assessment tool to measure patient safety culture in their healthcare facilities. We independently verified that the studies met the inclusion criteria and critically assessed the quality of the studies.

Decisions: 12 studies met our inclusion criteria. From the review we identified that working condition and perception of management are seen as a serious issue which needs to be improved. This composite is defined as the extent to which staff feel that there is no proper channel for them to direct questions regarding patient safety, difficulty of discussing errors and also the lack of culture of working environment to learn from errors. Other than that, working condition is also related towards staffing and also training of new personnel in the working area.

Conclusions: There is a need to promote patient safety culture as a strategy for improving the patient safety internationally. Improving patient safety culture should include all stakeholders, like policymakers, healthcare providers and those responsible for medical education. This review was limited only to English language publications. The varied version in which the SAQ was used may have influenced the areas of strengths and weaknesses as healthcare workers' perception of safety culture may differ.

PP – 11

An Evaluation Study to Compare Time of Endoscopy and Outcome in Gastric Cancer Detection between Open Access Endoscopy and Conventional Referral Endoscopy in Hospital Tuanku Jaafar Seremban

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Introduction: Gastric cancer is a huge public health burden. Delay in diagnostic endoscopy procedure causes further delay in gastric cancer diagnosis. Open access endoscopy is a direct referral system from general practitioner for endoscopy without prior specialist consultation. In the past, patients are referred for endoscopy via conventional referral endoscopy, whereby they are consulted to specialist prior given appointment for endoscopy. This study aims to compare time of endoscopy and outcome in gastric cancer detection between open access endoscopy (OAE) and conventional referral endoscopy (CRE) among patient suspicious of gastric cancer in Hospital Tuanku Jaafar Seremban.

Methodology: A retrospective cross-sectional study was conducted from January to December 2016. A total of 227 patients were included into the study. Time of endoscopy is defined as the average time taken from the patient's first visit to primary health care centre until endoscopy is done. Outcome of endoscopy is defined as endoscopic findings, which is categorized into normal, benign, precancerous and cancer, based on histopathology findings.

Decision: For CRE group, the median time of endoscopy is 68 days, while for OAE group, the median time of endoscopy is 15 days. The time of endoscopy in OAE is significantly shorter as compared to CRE (p-value <0.005). Outcome of endoscopy showed in CRE group, there are 1(0.6%) patient detected to have gastric cancer, as compared to in OAE group, there are 2(3.8%) patients detected to have gastric cancer. There is no significant difference between the outcome of endoscopy between CRE and OAE group (p-value 0.324). Elderly patients have significant shorter time of endoscopy as compared to younger patients. Patient with medical history of hypertension and diabetes mellitus also have a shorter time of endoscopy.

Conclusions: OAE is an effective referral system which allows a significant shorter time of gastric cancer detection with similar outcome.

PP – 12

A Systematic Review on Impact of Hospital Cluster Management

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Introduction: Many hospitals are turning to cluster relationships to gain the benefits of diversification without the troubles of increased capital costs and management conflicts. The goal of healthcare clusters is to provide a continuum of care to a defined geographic region through integration of referral and payment systems.

Methodology: Systematic review method in current study is based on PRISMA guidelines. We searched for literature by using database from three search engine which are PubMed, Ovid and Google Scholar.

Data extraction: We extracted data on study characteristic, characteristic of hospital and study outcome that consist of financial or scale economic, consolidate services, performance and satisfaction. Two -hundred and ninety-one papers were identified as relevant for data extraction, in total, 14 studies fulfilled our pre-defined inclusion and exclusion criteria for analysis.

Result of data synthesis: Delivering hospital services care mainly measured as technical and functional in many dimension. Hence, the opportunity to measure scale of efficiency and effectiveness of hospital clusters is crucial to optimal productivity and to manage a fair allocation of resources. The performances of clusters hospital were based on Data Envelopment Analysis (DEA) and outcome in utilization of resource with lower costing.

Conclusion: Hospital clusters is alternative ways in order to delivery healthcare services with better clinical outcome. We found a little difference in these dimension as mostly DEA is being used as a basic model to generate contextual dimensions. Based on their priorities and objectives, may lead to contribute to improve healthcare services and quality in lower costing. Benefits of cluster hospital are more in financial/economic scale, delivering physician services that becoming high demand nowadays, provide more jobs satisfaction among staff and better performance of healthcare services post clustering.

PP – 13

Balanced Scorecard Model Development As a Performance Measurement System For a Teaching Hospital in East Cost of Malaysia : A Research Protocol

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Introduction: Balanced Scorecard (BSC) is one of the powerful and practical tools to evaluate the performance of an organization including healthcare system. It comprised expended set of performance indicators by adopting multidimensional perspectives to help achieving organisation's mission. The main aim of this study protocol is to develop Balanced Scorecard as Performance Measurement System for a teaching hospital.

Methods: A cross sectional study adopting Delphi Method will be conducted. First step, the literature review for identification of the most common indicators used in Balanced Scorecard will be applied. Then, a Delphi Method will be adopted by selecting expert panellist to answer the questionnaire in getting the consensus for grouping the indicator into four BSC perspectives. Afterwards, the secondary data collection on the performance for the selected indicator in BSC will be carried out to measure the performance of this teaching hospital in a year duration.

Expected Outcome: Using this method, the consensus for grouping the indicators into four BSC Model will be determine based on four criteria by Vantamay, 2015 which are: mean > 3.51, median > 3.50, ratio of median and mode <1.00, and IQR <1.50. The final BSC Model will be presented using a strategic map as a graphical presentation.

Conclusion: According to literatures, BSC helps the organizations to measure their performance in a comprehensive approach using multidimensional aspect including financial perspective, customer perspective, internal processes perspective as well as learning and growth perspective.

PP – 14

DATA MONITORING AND TARGETED INTERVENTION REDUCES THE INCIDENCE OF THE CATHETER-RELATED BLOODSTREAM INFECTION

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Introduction: Catheter-related bloodstream infection (CRBSI) remains an important cause of preventable healthcare associated infection. Prevention of CRBSI requires strict adherence to central venous catheter bundle care. Continuous education among healthcare worker has been proven to play an essential role in sustaining the knowledge and the clinical skill which later contributes to the compliance to the central venous catheter bundle care. While the effectiveness of conventional educational system is limited, simulation-based education and training prove its ability to reinforce best practices among the staff in a realistic setting. This study showed the effectiveness of the conventional and the simulation based-educational system in their ability contribute to the reduction in the prevalence of CRBSI.

Methodology: A hospital-wide data on the prevalence of CRBSI was closely monitored. Series of interventions were done. Every series start with an interactive pre-training assessment on the knowledge and practices of the HCW on the central venous catheter bundle care. Subsequently the HCW were exposed to theory session which include lectures, video, demonstration and followed by hybrid simulation education activity. Following that, the post intervention assessment was performed. Post intervention prevalence of CRBSI was measure and compared

Results: The theory and practical for post-test central venous catheter bundle care compliance increased tremendously. Majority of the candidate love the approach very much. Prevalence of CRBSI reduce remarkably.

Conclusion: A close data monitoring and a continuous knowledge and practical assessment is mandatory for a successful intervention in prevention of CRBSI.

PP – 15

Using Blood Requisite and Blood Usage Data for Strategic Planning of Blood Collection: A Way to Prevent Wastage

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Introduction: Food and Drug Administration has limited storage of refrigerated red blood cells to 42 days. Stored blood degrades in various ways long before that six-week limit, and the changes may be harmful to patients who receive older blood. Wastage refers to any blood component or product which is discarded rather than administered to a patient. This can occur for a number of reasons and a certain level of blood product wastage is acceptable to ensure products are available when required for patients.

Methodology: A retrospective study was conducted in Transfusion medicine unit (Tmu), Hospital Universiti Sains Malaysia (USM) to analysed data on the blood collection, request, usage and expiry in January 2011 untill December 2018.

Decision: There was a total of 101204 units of blood collected and 92716 units of blood was transfused within 8 years period. 938769 blood requisition forms received by the TMU during the study period. Patients admitted to Hospital USM showed increasing in trend, however the trend of blood usage was slowly decreasing. Blood collected was always more than usage. Data on expired blood were collected and were recorded as 1568 units (1.5%). Our blood expiry rates was 1.5% and Pusat Darah Negara (PDN) has set a wastage rates of less than 2.5%. Blood wastage was due to blood expiration was noted to be increasing in trend. Similar findings were seen in other studies, where expired blood units being major cause of wastage. Regular audit of blood demand, proper documentation and adopting successful donation strategies, will reduce the rate of expired blood.

Conclusion: Wastage of blood in hospitals is a universal issue and should be addressed with easy and inexpensive interventions that can reduce wastage of blood. Blood bank need to plan its requirement judiciously and avoid unnecessary wastage. Ultimately it will result in decrease in the workload, cost, errors and risks related to transfusion, and finally increase customer satisfaction.

PP – 16

In Patient and Outpatient Satisfaction Level at a Tertiary Teaching Hospital in Kuala Lumpur

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Introduction: Patient satisfaction survey is a meaningful and essential sources of information in identifying gaps and in developing an effective action plan for quality improvement in healthcare organizations. The main objective of the survey was to measure patient satisfaction level of Hospital Canselor Tuanku Muhriz.

Methodology: This patient satisfaction evaluation study using a descriptive cross-sectional design. The study was conducted by the KL Campus Quality Division in February 2018 for Medical, Orthopedic, Ophthalmology, ENT Clinics ,and Medical and Surgical Wards.

Decision:

Outpatient Satisfaction Level

The satisfaction level of all clinics studied was higher than the standard set of > 85.0%. The highest level of outpatient satisfaction was the Ophthalmology Clinic with a total of 96.6% , the lowest level was at the ENT Clinic, a total of 94.1%. Patient satisfaction of the Orthopedic Clinic was 96.4% and the Medical Clinic was 96.2%. Orthopedic Clinics and ENT Clinics reported lower levels of patient satisfaction for the environmental factor which is 84.1% and 81.5%. The satisfaction levels by category are 99.6% Staff Service, 98.1% Medical Officer service, Counter service was 94.9%, environmental was 88.7% and for overall of 99.4%.

Inpatient Satisfaction Level

The highest level of inpatient satisfaction was at the Surgical Ward with a total of 97.7% and the Medical ward with a total of 92.1%. The lowest category of inpatient satisfaction level was in the Environmental of 93.9% in surgical ward and 82.6% in medical ward. Result of inpatient satisfaction levels by category are 99.5% Medical Officer service, 93.9% Counter service, 92.2% Staff Service, environmental was 86.9% and for overall of 98.2%.

Conclusion: All clinics and wards showed high level of satisfaction above the standard set. Over all inpatient and outpatient are very satisfied with the services of the counters, doctors and hospital staff. However environmental factor requires attention for improvement.

PP – 17

Increasing the Effective and Compliance to Hand Hygiene Practices Through Continuous Health Education at the Hospital Universiti Sains Malaysia

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Introduction: Unclean hands are the most important source of spreading of infections in healthcare facilities. While the knowledge about the importance of hand hygiene is very good, their best practices and the compliance to it are still poor. We aimed to develop effective hand hygiene (HH) practices and increase the hand hygiene compliance among HCWs by improving their knowledge, attitude and practices through a continues structured health education.

Materials and methods: A year-long project was conducted at Hospital Universiti Sains Malaysia. This included a baseline survey, intervention by promoting standard HH practices and hand hygiene compliance through classrooms, road show and hands-on bed side training, and a post intervention survey. Pretest-posttest was conducted with preformed questionnaire and observation checklist during pre and post intervention surveys was performed.

Results: Multiple hand hygiene continuous education classes were done. A- week long hand hygiene roadshow and a scheduled bed side hand hygiene education were performed. The post intervention hand hygiene compliance audit showed a remarkable increment.

Conclusions: The project outcomes signify that active hand hygiene promotion improves the effective hand hygiene practices and increase the hand hygiene compliance among HCWs. The results emphasize the necessity of continuous education and advocacy in improving hand hygiene compliance to promote excellency in infection prevention and control.

PP – 18

In-Patient Satisfaction Level and its Associated Factor for a Teaching Hospital in the East Coast of Malaysia

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Introduction: Patient's view is becoming an important tool for monitoring and evaluating the healthcare quality which lead to better quality of care. Patient satisfaction survey is one of the approaches in getting patient feedback on healthcare quality.

Methodology: A cross-sectional study was conducted from January to February 2019 in a teaching hospital in East Coast of Malaysia. 550 respondents were required based on two proportion formula calculation. Multistage sampling was applied, 13 out of 39 wards were randomly selected based on three disciplines, 1) medical discipline ward, 2) surgical discipline ward and 3) obstetrics and gynaecology discipline. 42 respondents proportionate to wards discharge were selected by systematic random sampling. A Malay validated HCAHPS questionnaire was used. Multiple logistic regression was used to identify the significant associated factor with satisfaction level.

Decision: A total of 547 respondents were involved in the study whereby 61.6% were female, 85.9% were less than 60 years old and most were married (73.1%). Only about a quarter had tertiary education. More than 60% of respondents had negative experience (lower box) in all patient experience domain. 57.6% of the respondents had high satisfaction level meanwhile 64.5% of the respondents willing to recommend this teaching hospital to others. The communication with nurse, communication with doctor and environment of care were the three significant factors associated with high satisfaction level.

Conclusion: This study provides excellent opportunities for targeted quality improvement by commencing the initiatives to improve staff-related items and environment of care component.

PP – 19

Cost Analysis of Laparoscopic Versus Open Appendectomy in Hospital Canselor Tuanku Muhriz

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Introduction: Open appendectomy (OA) has been the gold standard for treating patients with acute appendicitis but in recent years, laparoscopic appendectomy (LA) had resulted in reduced hospital stay, lower incidence of wound infection, faster return to normal work activities, shorter postoperative ileus, less postoperative pain and better cosmetic results. Nevertheless, LA may be still controversial because of longer operative time, higher risk of postoperative intra-abdominal abscesses and higher costs as compared to OA. The higher cost is particularly important factor for developing nations like Malaysia because of limited budgets for hospital expenditures.

Methodology: Retrospective cross-sectional cost analysis study was conducted for OA and LA. Casemix database was obtained from January to July 2017 for patients undergone OA and LA. Patients' medical records were later attained from the Medical Record Department to verify the procedure undergone, treatment indication, and resources utilised throughout the hospital stay. Relevant information was collected from Human Resource and Finance Departments in HCTM to enable the costing calculation that consist of both capital and recurrent cost.

Decision: Total of 37 patients were chosen. More than two thirds (70%) underwent LA, with younger mean age (29.3 years old) compared to OA (47.7 years old). OA resulted in longer mean hospital stay (4.1 days) compared to LA (3.1 days). OA had higher total cost per procedure (RM2941.38) compared to LA (RM2717.27).

Conclusion: The total cost of performing LA was lesser than OA contributed by shorter length of stay, cheaper cost in terms of building, emolument, overhead cost, utility, consumable, laboratory and imaging and recurrent cost. However, OA showed lesser cost for equipment, total capital cost and medications. Cost estimates based on clinical pathway will give more accurate estimates of the cost for each treatment procedure.

PP – 20

Evolution Of Laboratory Critical Values Reporting In Tertiary Teaching University Hospital Usm

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Introduction: Critical values are defined as extreme abnormal laboratory tests results which could be life threatening if treatment is not initiated immediately. Communication of these results are important for patient safety. The aim of this study was to evaluate retrospectively the current notification of critical values via LIS as to the previous manual notification in terms of rate and efficiency.

Methodology: This was a retrospective study conducted from 2015 to 2018 evaluating the current protocol against the old protocol. All data obtained from the manual records (2015-2016) and in-house LIS (2017-2018) were reviewed. The critical value results notification reported by routine laboratory were based on the limits set by Ministry of Health Malaysia which was <30 minutes. Total number of notifications, time for the notification and magnitudes of critical value were reported.

Decision: In 2015 and 2016, the critical values notification via phone yielded 0.04% and 0.05% out of the total laboratory tests respectively and in 2017 and 2018 the values yielded 0.28% and 0.61%. The notification time set <30 minutes in 2015 and 2016, achieved 100% however in 2017 the mean (SD) notification time <30 minutes was 10.9 (0.4) min for low critical values and 9.0 (1.8) min for high critical values. In 2018 the mean (SD) notification time <30 minutes was 9.9 (0.8) min for low critical values and 8.5 (1.7) min for high critical values. There was no change in the magnitude of critical results notification (sodium, potassium and bilirubin) throughout the 4 years reviewed.

Conclusion: The current notification of critical values via LIS was appropriate with better detection and efficient. Nevertheless, there are some limitations that hamper the achievement of notification of critical values <30 minutes to 100%. Alternatives were proposed for a proper and precise evaluation of the current protocol.

PP – 21

Patients' Characteristics and Outcomes Analysis of Copd Readmissions In HCTM

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Introduction: Chronic pulmonary obstructive disease (COPD) is one of the most prevalent non-communicable diseases worldwide. Recently, COPD inpatient admissions represented a significant economic burden, accounting for over half of direct medical costs. Since the prevalence of COPD admissions in Malaysia is 448,000 cases including readmissions per year, it would reflect the economic burden and quality of care of COPD management.

Methodology: This study investigated COPD readmissions in Hospital Canselor Tuanku Mukhriz (HCTM), one of the teaching and tertiary hospitals in Kuala Lumpur. A retrospective study on Casemix database of COPD admissions for 2016 and 2017 were done extracting 321 readmissions involving 270 patients. They were analysed for characteristics of patients, severity of admissions, comorbidities and average length of stay (ALOS).

Result: The mean age for COPD patients was 70.89 (\pm 9.46) years old with 79.6% male patients and majority of patients had readmissions following index admission from January 2016. There were significant association between the severity of COPD admissions and ALOS and number of comorbid (both p value <0.05).

Conclusion: This study found that patients with higher COPD admission severity had more readmissions, more comorbidities and longer ALOS which would translate to more cost during the episode of care. Future study on care pathway for COPD is recommended to improve the quality of in order to reduce readmission.

PP-22

Compliance Towards Private Healthcare Facilities & Services Act (PHFSA)1998 Among Private Clinic

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Introduction: Private Healthcare Facilities and Services Act (PHFSA) 1998 (Act 586), is a formulation of public policy for private general practitioners (GP) and their facilities to comply for ensuring quality of healthcare services delivered. Cawangan Kawalan Amalan Perubatan Swasta (CKAPS) is the implementor and enforcer of the PHFSA. As part of the regulations, all private clinics need to be registered with the CKAPS before operating. Consequently, the monitoring of compliance is done through post registration visits also known as pasca. The visit is made compulsory within one year of the clinic registration date. This is one of the key performance indicators (KPI) of the state health director. During the inspection, the evaluation is based on three forms consisting of 194 items. Currently, there is no efficient system to monitor the private clinic's compliance towards the regulations. Therefore, this study aims to determine the compliance rate among the private clinics and to identify the non-compliance items to the regulations.

Method: Statistical process control (SPC) tool is used to determine the compliance rate to the regulations. A state in Malaysia is randomly picked to demonstrate the study. Three years data (2016-2018) were collected and tabulated into Microsoft Excel for analysis. The non-compliance items were determined based on the compliance score.

Results: Mean average compliance rate to the regulations was only 85% (range: 48%-99%). Top non-compliance items identified were absence of staff register, fee schedule, vector control arrangement and infection control notification system. Some clinics are unable to exhibit staff duty roster, patient's rights and staff identification. Half of the clinics that provide vaccination did not comply to cold chain maintenance guideline.

Conclusion: CKAPS to focus on private clinic's compliance towards regulations instead of focusing in achieving number of clinics inspected as stated in current KPI.

PP – 23

Determination of the Validity of the Video Head Impulse Test (vHIT) among Malaysian Healthy Adults

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Video head impulse test (vHIT) is one of objective balance test a clinical head to evaluate the vestibular systems specifically vestibulo ocular reflex (VOR). The VOR is the reflex mechanism that carries out the function of gaze stabilization which is one of the most important functions of the balance system. Main aim of this study is to determine the test retest reliability of the otometrics video head impulse test (vHIT) among healthy adults aged 18 to 35 years (mean age of 22.51 years). This was a repeated measures study that recruited 51 young adults (102 ears, 33% were males and 67% were females). After screening by using Modified Malay Version Vertigo Symptom Scale (MMVVSS), the participants underwent vHIT testing for the first session and then the test was repeated again for the second session within 1 to 2 weeks. The vHIT was carried out according to the standard protocol and the head of the participants were rotated in the different planes which was lateral, anterior and posterior. The results showed that the lateral canals have high gain compared to anterior and posterior canals in session 1 and session 2. Then, there is no significance difference ($p>0.05$) between VOR gain of session 1 and session 2 for each semicircular canals except for the left lateral. The right lateral showed the highest correlation which is 0.746 while right anterior showed the lowest correlation which is 0.545. However, the overall canals revealed moderate to high correlation (0.5 to 0.7). In conclusion, vHIT is a good test to determine the vestibular function by measuring the VOR gain of each canals.

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Preoperative Anxiety among Patients at a Teaching Hospital

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Background and aims: Preoperative anxiety can increase intra-operative risks and delay post-operative recovery. This study aimed to determine the prevalence of preoperative anxiety and its associated factors.

Materials and methods: A total of 432 elective surgical patients aged 17 years above were recruited via convenience sampling. The day before surgery, they were given a questionnaire consisting of the patient's demographic data and the Amsterdam Preoperative and Information Scale (APAIS). The APAIS comprised of items assessing preoperative anxiety and patient preference for anaesthesia and surgical information. An APAIS score of ≥ 11 categorised the patient as anxious.

Results: The prevalence of preoperative anxiety was high at 97.7% and 94.4%, before and after the anaesthetic visit respectively, ($p < 0.001$). A reduction in the mean APAIS score (19.93 ± 4.88 vs 17.17 ± 4.82) was seen after the anaesthetic assessment, ($p < 0.001$). Preoperative anxiety was present among the female patients ($p < 0.001$), and patients with no chronic illness ($p < 0.001$), no history of hospital admission ($p < 0.012$) nor previous surgery ($p = 0.035$). Other factors associated with preoperative anxiety included patient age ($p < 0.001$), education level ($p < 0.001$), method of hospital payment ($p = 0.001$) and employment status ($p < 0.001$).

Conclusion: The prevalence of preoperative anxiety among patients of this study is high. The preoperative anaesthetic visit significantly reduced the prevalence and the APAIS score. Factors associated with preoperative anxiety include female gender, a negative history of chronic illness, hospitalisation and surgery, patient's age, education level, method of hospital payment and employment status.

Keywords: Preoperative care, anxiety, anaesthetic

Internet Gaming Disorder and its Association with Sociodemographic Distribution, Depression, Anxiety and Stress Among Undergraduate Students at Universiti Kebangsaan Malaysia

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Background and aims: Internet gaming disorder (IGD) is included in Section III of Diagnostic and Statistical Manual of Mental Disorders (DSM-5) as a condition for further study. This cross-sectional study aimed to establish the rate of IGD and its association with sociodemographic characteristic, depression, anxiety and stress among undergraduate students at Universiti Kebangsaan Malaysia(UKM).

Materials and methods: A total of 411 students from randomly selected faculties completed the study via web survey. The online questionnaire comprised Internet Gaming Disorder Scale-Short-Form (IGDS9-SF) and the Depression, Anxiety, Stress Scale (DASS21).

Results: The rate of IGD among the UKM undergraduate students was found to be 52.8%. Using hierarchical multiple regression, age ($\beta = -0.09$, $p < 0.05$), gender ($\beta = -0.40$, $p < 0.001$) and stress ($\beta = 0.23$, $p < 0.05$) were found to be significant predictors of IGD. Meanwhile, academic performance, depression and anxiety were not significant predictors of IGD.

Conclusion: These findings highlight the risk factors of IGD and its adverse association with psychological distress. Further studies and intervention emphasizing on preventive strategies are important to address the issue.

Keywords: DSM-5, Internet, problematic gaming, prevalence, psychological distress

Assessing the Accuracy of Radiology Trainees in Interpreting Pre-Operation Temporal Bone High Resolution Computed Tomography in Cochlear Implant Candidates in Universiti Kebangsaan Malaysia Medical Centre

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Background and aims: Temporal bone high resolution computed tomography (HRCT) is the preferred modality for imaging workup of cochlear implant candidates as it depicts precisely the complex inner ear anatomy. HRCT should be performed, and radiologists should establish the correct diagnosis for clinicians to plan the potentially surgical intervention. The study aimed to assess the accuracy of radiology trainees with different levels of experience in interpreting HRCT images.

Materials and methods: A prospective cross-sectional study was conducted among 50 radiology trainees comprising Year 1, 2, 3 and 4. Data collection was done within an hour using a form and files comprising 15 HRCTs images of normal, single or multiple abnormal findings. Six choices of inner ear abnormalities were listed in the form. Final interpretation from a senior radiologist was the gold standard in this study.

Results: A total of 50 radiology trainees enrolled in the test with 6 (12%) first year, 12 (24%) second year, 12 (24%) third year and 20 (40%) fourth year. Trainees comprised 26 (52%) male and 24 (48%) female. Mean score among trainees was $58.0 \pm 14.4\%$. The highest score obtained was 90.0% and the lowest score was 26.7%. There was a statistically significant difference in accuracy in interpreting temporal HRCT between radiology trainees from different levels of experience ($p < 0.05$). The most difficult inner ear anomaly to be identified was incomplete partition detected by only 3 (6%) trainees. However, the most commonly missed anomaly was internal auditory canal stenosis in which 29 (58%) missed the diagnosis.

Conclusion: Interpretation in pre-operation Temporal HRCT in cochlear implant patients can be influenced by the level of experience among radiology trainees. Therefore, more Ear, Nose, and Throat (ENT) radiology training should be implemented for early intervention in severe to profound sensorineural hearing loss patients.

Keywords: Inner ear, computed tomography, hearing loss, trainees

Association of Coronary Artery Calcium Scoring in Plain Computed Tomography (CT) Cardiac with Type 2 Diabetes Mellitus

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Background and aims: Type 2 diabetes mellitus (T2DM) is an established risk factor for coronary heart disease. Coronary artery calcium (CAC) is a highly specific feature of coronary atherosclerosis. CAC scoring (CACS) has emerged as a widely available and consistent means of assessing risk for major cardiovascular outcomes. This study aimed to determine the association of T2DM with coronary artery calcium using CACS.

Materials and methods: A cross-sectional study was conducted in Universiti Kebangsaan Malaysia Medical Centre (UKMMC). A total of 82 patients with T2DM referred for cardiac CT from January 2010 until July 2019 were included. The images were retrieved from Picture Archiving and Communication System, and the Agatston scores were calculated. The diabetic histories of each patient were traced from the medical record unit, and the relevant parameters were recorded. The statistical analysis used include Spearman correlation, Mann-Whitney U Test and ANOVA test.

Results: Out of 82 patients, there were 51 males (62.2%) and 31 females (37.8%). The mean CACS for male was 644.3 ± 1093.1 while the mean CACS for female was 277.7 ± 675.8 . The maximum CACS for male and female was 5178 and 2797, respectively. The mean of CACS among patients was 505.7 ± 968.9 with the highest score being 5178. All patients were under treatment with the mean duration of 10.3 ± 6.1 years. The longer duration of T2DM was significantly associated with higher CACS ($p=0.05$). Diabetic treatment with oral hypoglycaemic agents (OHA) produced significantly lower CACS compared to insulin ($p=0.017$). HbA1c and fasting blood sugar which indicate glucose control did not show any significant findings.

Conclusion: CACS can be influenced by duration and types of diabetic treatment. OHA is found to be cardio protective in type 2 diabetes mellitus patients. Level of glucose control did not have a significant impact on CACS.

Keywords: Coronary atherosclerosis, cardiac imaging technique, hypoglycaemic agent

Effects of Virgin Coconut Oil and Palm Tocotrienol on Renal Oxidative Stress in Postmenopausal Rat Model Fed with Heated Palm Oil Diets

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Background and aims: Consumption of repeatedly heated palm oil is associated with oxidative stress and is known to be harmful to kidneys. Virgin coconut oil (VCO) and tocotrienol (TT) are reported to possess antioxidant, renoprotective and anti-inflammatory properties. This study aimed to investigate the effects of VCO and TT on renal oxidative stress parameters and kidney histological changes in postmenopausal rats, fed with repeatedly heated palm oil.

Materials and methods: Fifty-six female Sprague-Dawley rats (200-250g) were randomly divided into seven equal sized groups. The sham group was fed with normal rat chow. The remaining groups were ovariectomised and fed with 15% five-time-heated palm oil (5HPO) and 2% cholesterol. Apart from the control group, the rest of the groups were treated with either mono or combination therapy of VCO in varying doses and TT which were administered orally: Groups V1 (VCO 1.43 ml/kg), V2 (VCO 4.29 ml/kg), TT (TT 30.00 ml/kg), VT1 (combination of VCO 1.43 ml/kg + TT 30.00 ml/k) and Group VT2 (combination of VCO 4.29 ml/kg + TT 30.00 ml/kg). After 24 weeks of treatment, the rats were sacrificed and the kidneys were collected for biochemical and histological analysis.

Results: No significant differences ($p > 0.05$) were observed for malondialdehyde (MDA), nicotinamide adenine dinucleotide phosphate (NADPH) oxidase and nitric oxide levels among all groups. Heme oxygenase-1 activity was significantly reduced ($p < 0.05$) in TT and VT2 compared to V1 and V2. Moreover, the treatment with V2 showed significant reduction ($P < 0.05$) in tissue necrosis compared to the control group and treated with V1 or VT1.

Conclusion: VCO and TT, whether administered alone or in combination, managed to reduce some of the harmful effects of repeatedly heated palm oil consumption in postmenopausal rats given high-cholesteroldiet.

Keywords: Vitamin E, renoprotective, ovariectomized

Safety Attitude Assessment among Health Care Personnel in a Teaching Hospital

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Background and aims: Patient safety culture is important to ensure better healthcare performance. This study aimed to assess the perception of safety attitudes among doctors and nurses in a teaching hospital, provide a profile of their domains of safety attitude and correlate their attitudes with multiple factors.

Materials and methods: This was a cross-sectional study utilising the Safety Attitude Questionnaire (SAQ). This study recruited 160 doctors and 304 nurses at a tertiary teaching hospital in Kuala Lumpur Malaysia.

Results: Response rate was 58.0%. Job satisfaction (73.4 ± 17.6) and perception of management (56.1 ± 12.9) received the highest and lowest mean score, respectively. Doctors exhibited positive attitudes towards stress recognition (57.5%), job satisfaction (46.3%), teamwork climate (36.3%), safety climate (28.1%), working condition (25.6%), overall patient safety culture (16.3%) and perception of management (9.4%). Meanwhile, nurses exhibited positive attitudes towards job satisfaction (74.3%), teamwork climate (45.1%), working condition (41.1%), safety climate (39.5%), stress recognition (28.3%), overall patient safety culture (12.8%) and perception of management (10.9%). The doctors ($p = .001$) were 0.08 times less likely to have a positive response on job satisfaction (OR .08, CI .02 to 0.4). Respondents who attended safety culture training ($p = .025$) were 0.6 times less likely to score a positive response on stress recognition domain (OR 0.6, CI 0.3 to 0.9).

Conclusion: Group-specific interventions that target specific domains are necessary to improve the safety culture among doctors and nurses. Intervention should be done and focused on doctors since nurses have better perception of patient safety culture.

Keywords: Perception, medical error, doctors, nurse

Association between Abnormal Oral Glucose Tolerance Test and Pregnancy Outcomes

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Background and aims: Gestational diabetes mellitus (GDM) is associated with adverse maternal and neonatal outcomes. We aimed to investigate the relationship between abnormalities of oral glucose tolerance test (OGTT) and pregnancy outcomes.

Materials and methods: This was a retrospective study of women with GDM, who delivered in Universiti Kebangsaan Malaysia Medical Centre over the five-year period. The diagnosis of GDM was based on NICE guideline (fasting glucose ≥ 5.6 mmol/L, two-hour glucose ≥ 7.8 mmol/L). The patients' demographic data, OGTT results and pregnancy outcomes were analysed.

Results: A total of 1105 women were included for final analysis. The proportion of women with abnormal fasting and two-hour glucose were 12.9% and 95.2% respectively. Majority of women had single abnormal OGTT value (91.9%) whilst the remaining 8.1% had both abnormal values. Only 12.4% of women required treatment for GDM with metformin and insulin. Women with fasting hyperglycaemia were five times more likely to require treatment than those with normal fasting glucose (odds ratio [OR]: 5.47, 95% confidence interval [CI]: 3.64-8.24, $p < 0.001$). Two-hour glucose derangement was associated with diet control (OR 3.67, 95% CI 2.00-6.73, $p < 0.001$). Both abnormal OGTT values increased the risk of insulin treatment by four-fold (OR 4.50, 95% CI 2.65-7.66, $p < 0.001$). There was no significant relationship between abnormal OGTT values and mode of delivery or preterm birth. Fasting hyperglycaemia and both abnormal OGTT values carried significant greater risk of gestational hypertension and neonatal hypoglycaemia amongst our cohort. There was no significant association between abnormal OGTT and foetal macrosomia, shoulder dystocia, neonatal jaundice or respiratory distress syndrome.

Conclusion: Fasting hyperglycaemia and both abnormal OGTT values were associated with more severe GDM, which warranted treatment and carried increased risks of pregnancy complications. Close glucose monitoring in pregnancy and early treatment initiation are essential for favourable pregnancy outcomes.

Keywords: Gestational diabetes, gestational hypertension, hyperglycaemia

A Cross-Sectional Study of the Prognostic Significance of PTEN Protein in Endometrioid Endometrial Adenocarcinoma

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Background and aims: Endometrial carcinoma is one of the most common gynaecological malignancies in developed countries. Mutations in the Phosphatase and Tensin Homolog (*PTEN*) tumour suppressor gene, *K-ras* oncogene and microsatellite instability are the most frequent early molecular genetic alterations in endometrioid adenocarcinoma. This study aimed to determine the significance of PTEN protein expression in endometrioid endometrial carcinoma (EEC) in correlation with tumour characteristics.

Materials and methods: In this cross-sectional study, 30 paraffin-embedded tissue blocks with EEC in a 5-year period (January 2014-December 2018) were retrieved from the Histopathology Laboratory in Universiti Kebangsaan Malaysia Medical Centre (UKMMC). International Federation of Gynecology and Obstetrics (FIGO) staging system was used to stage the disease. Patient's characteristics were traced using their medical records. Immunohistochemistry (IHC) for PTEN biomarkers on the prepared paraffin block samples was performed. Data were statistically analysed using SPSS with P value of <0.05, indicates significant.

Results: Among 30 samples of EEC, 14 (46.7%) showed positive PTEN protein expression while 16 (53.3%) were negative. The mean age was 62.00 ± 9.51 years old, while mean Body Mass Index (BMI) is 27.28 ± 7.16 kg/m². There was no significant difference between age ($p=0.27$, 95% CI: -10.98 to 3.21) and BMI ($p=0.67$, 95% CI: -4.30 to 6.58) with PTEN protein expression. Positive and negative PTEN protein expressions were not significantly associated with ethnic ($p=1.00$), stage ($p=0.91$), grade ($p=0.85$), survival ($p=1.00$). There was no significant correlation between PTEN protein expression with CA-125 level ($p=0.47$) and survival ($p=1.00$).

Conclusion: This study concluded that PTEN protein expression does not correlate significantly with the stages and grades of EEC. Thus, PTEN protein expression is not prognostically significant to be used in clinical practice yet.

Keywords: Endometrial cancer, PTEN protein, immunohistochemistry, tumour staging, tumour grading

Comparison between Portable Non-Mydriatic Fundus Camera and Non-Portable Non-Mydriatic Fundus Camera in Detecting Diabetic Retinopathy

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Background and aims: Diabetic retinopathy (DR) screening is commonly performed by dilated fundus examination and fundus imaging. Screening can also be done by using non-portable non-mydriatic fundus camera. This study aimed to determine the reliability of portable non-mydriatic fundus camera by comparing the sensitivity and specificity of portable and non-portable non-mydriatic fundus camera against dilated fundus examination in detecting diabetic retinopathy.

Materials and methods: A cross-sectional study was carried out on diabetic patients attending Ophthalmology Clinic in Universiti Kebangsaan Malaysia Medical Centre for DR screening and follow up. A total of 154 diabetic patients were purposely recruited. Images from 237 eyes were obtained with the portable and non-portable fundus camera of central field without dilatation. Then, dilated fundus examination (DFE) was carried out as diagnostic reference by a medical officer. Images obtained were graded by two masked ophthalmologists. Sensitivity and specificity to detect DR with the portable and non-portable non-mydriatic fundus camera was calculated and compared to DFE.

Results: In this study, there were 71.3% subjects with no DR, followed by mild non-proliferative diabetic retinopathy (NPDR) of 15.6%, moderate NPDR of 8%, severe NPDR of 5.1%. Grader 1 and grader 2 had a sensitivity of 47.1% and 52.9%, specificity of 97% and 98.2% in detecting DR using portable non-mydriatic fundus camera respectively. For non-portable, non-mydriatic fundus camera, grader 1 and grader 2 had a sensitivity of 64.7% and 67.6%, specificity of 92.9% and 94.7% in detecting DR. The inter-rater agreement using portable and non-portable non-mydriatic fundus camera in detecting DR was 0.718 and 0.776 respectively.

Conclusion: Non-portable non-mydriatic fundus camera is superior to portable non-mydriatic fundus camera in DR screening.

Keywords: Portable non-mydriatic fundus camera, non-portable non-mydriatic fundus camera, diabetic retinopathy, screening

Physicochemical Characterization of Bilayered Composite Natural Biomaterial as a Potential Wound Dressing

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Background and aims: The optimum aim for wound to heal should serve a great impact on the quality of life. Thus the production of an ideal wound dressing is widely on the track, to eliminate certain drawbacks, including to promote tissue regeneration and prevent a bacterial invasion. This study aimed to develop a bilayer composite bioscaffold from natural-based resources for wound dressing.

Materials and methods: The bilayer hybrid bioscaffold was fabricated out from the combination of ovine tendon collagen type I and palm tree-based nanocellulose. The bioscaffold was post-cross-linked with genipin. The physical characteristics were evaluated based on its microstructure, pore size, porosity, water-uptake, retention capacity followed by degradation behaviour and mechanical strength. The chemical analysis was performed by the Fourier transform infrared spectrophotometry (FTIR), X-ray diffraction (XRD) and energy dispersive X-ray spectroscopy (EDX).

Results: Results showed a uniform interconnected porous structure with optimal pore size, good porosity, high water uptake capacity (>1500%) and suitable mechanical properties. The degradation process was more than 7 days. Further analysis with FTIR demonstrated interaction between collagen and cellulose while XRD showed smooth wavy wavelength consistent with amorphous material of the scaffold.

Conclusion: In conclusion, the fabricated bilayered composite bioscaffold with appropriate physico-chemical and mechanical properties has a high potential as a skin wound dressing.

Keywords: Collagen, nanocellulose, composite bioscaffold, wound dressing

Effects of Honey on Corneal Wound Healing: A Systematic Review

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Background and aims: Corneal wound healing involves complex events that pose continuous challenges in promoting rapid and effective healing. The chief setback of current treatment is the side effects of preservatives and the development of antimicrobial resistance. Leading to an increased concern to seek alternative treatment using natural products. The preference of honey in this study as a natural product is due to its natural biochemical properties and abundance. This review aimed to highlight the effects of different types of honey on in-vivo and in-vitro corneal wound healing models.

Materials and methods: A comprehensive literature search was performed in four electronic databases of published literature consisting of PubMed, Medline & Ovid, Scopus and EBSCOhost. The keywords used consist of (1) honey AND (2) cornea* AND (3) heal* OR proliferate*, inflammat*, migrat*, differentiat*. Articles written in English and published from year 2000 till June 2019 were included.

Results: The merged data was assessed using PRISMA guidelines. Initial search included a total of six hundred and twenty-eight studies. Eight studies met our criteria and were included in this review. Six of the studies were done in-vitro and two others were in-vivo. The honeys used in the studies were Acacia, Gelam, Tualang and wildflower honey. All eight studies showed positive effects of honey on corneal wound healing by reducing inflammation and promoting proliferation, migration, and differentiation due to its anti-inflammatory, antibacterial, and antioxidant properties.

Conclusion: This review established the prospective development of honey as an effective alternative or adjunct treatment for corneal injury. Extensive studies should be done on the method of administration, mechanisms and clinical outcome of honey on corneal wound healing.

Keywords: Natural, ocular, injury, treatment

A Study on the Mortality and Morbidity Outcomes in Neck of Femur Fracture among the Elderly in a Tertiary Hospital in Malaysia

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Background and aims: Surgical intervention has been shown to reduce mortality and morbidity in elderly patients with neck of femur fractures. However, most information comes from Western studies and information regarding our local population is limited. The majority of surgical patients also had delayed operative interventions due to various factors. This study aimed to determine the outcomes of morbidity and mortality among the elderly managed surgically and conservatively following neck of femur fracture within the first five years of trauma.

Materials and methods: Database of all patients with neck of femur fracture older than 50 years old admitted to Universiti Kebangsaan Malaysia Medical Centre (UKMMC) from January 2012 to January 2017, were reviewed. Those who fulfilled the inclusion criteria of having a single, isolated neck of femur fracture from trivial trauma were included in the study. Patients were categorized according to the interventions and were assessed in terms of length of stay, post trauma ambulatory status, mortality and complications. Mortality data was obtained from Jabatan Pendaftaran Negara Mortality Data Matching Service. Patients who were still alive were assessed functionally using the Oxford Hip Score via phone interviews.

Results: Preliminary results showed patients treated surgically had significantly lower length of stay, better ambulatory outcome, lower mortality rate and rate of complications compared to patients treated conservatively. Those who had surgery also had better functional outcome based on Oxford Hip Score. The percentage of the one-year mortality rate for patients treated surgically and conservatively are still being analysed.

Conclusion: Patients with neck of femur fracture should be treated surgically as they have improved outcomes and quality of life.

Keywords: Femur, fracture, hemi-arthroplasty, total hip replacement, conservative treatment

Caffeine Intake And Its Association With Mental Health Among Medical Students In Universiti Kebangsaan Malaysia Medical Centre

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Background and aims: Caffeine (1,3,7-trimethylxanthine) consumption among students is known to increase alertness and energy, as well as to alleviate stress. There has been an increase of caffeine consumption amongst young adults. Currently, there is no study regarding caffeine consumption and its influence on mental health among Malaysians. We aimed to determine the relationship of caffeine consumption with depression, anxiety and stress among medical students.

Materials and methods: A cross-sectional study was conducted among medical students in the Faculty of Medicine, Universiti Kebangsaan Malaysia. Data were collected via online survey using two questionnaires, namely the semi-quantitative Food Frequency Questionnaire on Caffeine Intake and Depression, Anxiety and Stress Scale (DASS-21).

Results: A total of 262 medical students completed the survey. The prevalence of depression, anxiety and stress was 9.2%, 16.8% and 1.1%, respectively. Majority of students (98.5%) consumed caffeine from coffee, tea, soft drinks, energy drinks and chocolate drinks/food. The median daily caffeine consumption for all students including non-consumers was 67.1 mg/day, with a median of 67.99 mg/day among caffeine consumers. There was a significant association between race and anxiety ($p=0.038$) in which the Malay students had the highest prevalence (21.1%), followed by Indian (16.1%), other races (15.4%) and Chinese students (3.8%). There was no association between caffeine consumption and mental health status among medical students in this study.

Conclusion: Caffeine consumption does not influence mental health of medical students in this study. Anxiety is the most prominent mental-health problem among them. A programme tailored to medical students, in recognising symptoms of a mental-health problem should be conducted so that early intervention can be carried out.

Keywords: Caffeine, 1,3,7-trimethylxanthine, mental health, medical students

The Practice of Complementary and Alternative Medicine among Patients with Type 2 Diabetes Mellitus in a Tertiary Medical Centre

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Background and aims: Complementary and alternative medicine (CAM) were a favoured treatment chosen by the locals to reduce blood-sugar level. The aim of this study was to observe the prevalence of use of CAM among patients with type 2 diabetes mellitus with regard to their respective socio-demographic features and the blood-sugar level in these patients.

Materials and methods: A cross-sectional study was conducted in Universiti Kebangsaan Malaysia Medical Centre (UKMMC) using simple random sampling. There were 329 type 2 diabetic patients who participated in this study. A self-administered questionnaire on socio- demographic information and reason of usage of CAM was used to collect data with obtained consent.

Results: The prevalence of CAM used was 37.9%. Malays (68.0%) were the most frequent users, followed by Chinese (16.0%) and Indians (14.0%). Female (56.0%) were more likely than male (44.0%) in using CAM and is significant ($p=0.038$). Regarding the types of CAM, herbal and dietary supplements (77.2%) were the most highly used, followed by chiropractic/massage (13.4%), tai chi/yoga (5.5%), ayurveda/acupuncture (3.1%), and the least were reiki (0.8%). According to the level of education of these patients, patients who had a level of education of secondary school, used CAM the most (50.4%), next was tertiary level of education (28.0%), followed by primary school (18.4%), and finally patients with no education background (3.2%), but it was not significant ($p=5.704$). Majority (81.4%) of the participants who practiced CAM had abnormal HbA1c level. However, there was no relationship between practice of CAM and the HbA1c level ($p=2.940$).

Conclusion: This study indicated that patients with type 2 diabetes mellitus do not practice CAM. In addition, usage of CAM among patients with type 2 diabetes mellitus is not effective in reducing serum HbA1c level of the patients.

Keywords: Alternative medicine, type 2 diabetes mellitus, blood HbA1c protein

The Effects of Mixed Tocotrienol and Tocopherol From Palm Oil on the Healthspan and Lifespan of *Caenorhabditis Elegans*

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Background and aim: Vitamin E is well-known to be a potent fat-soluble antioxidant. Free radicals, a product of oxidation plays a part in shortening the lifespan and increasing frailty contributing to poorer health span. In this study, palm tocotrienol-rich fraction (TRF) was used to identify its effects on the healthspan and lifespan of *Caenorhabditis elegans* (*C. elegans*) which share common gene sequence with humans.

Materials and methods: For lifespan, the nematodes were treated with different concentrations of TRF (0 microgram - 200 microgram). The number of surviving nematodes in each concentration (N=30, duplicate) was counted daily under a light microscope. Two parameters were used to determine the healthspan, namely locomotion, and thermotolerance. The nematodes were divided into 3 groups (N=10, duplicate) and treated as control, Tween-80 (vehicle), and TRF-treated, respectively. The result was taken on adult Day 4 and adult Day 12 post-treatment using image J for locomotion whereas, in thermotolerance, the number of surviving nematodes were counted after exposure to 37°C.

Results: TRF treated *C. elegans* showed a significantly longer lifespan compared to control (P = 0.003). TRF-treated group (50µg/ml) had the highest mean lifespan of 23.5 days, which was significantly higher as compared to control, 18.5 days (P = 0.002). However, the locomotion was similar between all groups. In the thermotolerance assay, the survival of day 4 and day 12 TRF-treated nematodes was significantly higher compared to control (P= 0.046). Besides, Tween 80 also showed similar results as TRF when compared to control. However, no difference was found between TRF and Tween 80 treated nematodes.

Conclusion: TRF prolongs the lifespan and increases the thermotolerance of *C. elegans* without improving the locomotion of the worms as they age.

Keywords: Vitamin E, locomotion, thermotolerance, aging, oxidative stress.

A Cross-Sectional Study of Immature *Aedes* Abundance in a Residential College in Cheras, using Ovitrap with NPK Fertiliser as Attractant

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Background and aims: Dengue is among the important arboviral infections in the world transmitted by *Aedes* mosquitoes, especially *Ae. aegypti* and *Ae. albopictus*. The main objective of this study was to investigate the abundance of immature *Aedes* mosquitoes and meteorological factors, which caused its fluctuation in a residential college in Cheras.

Materials and methods: A total of 30 Mosquito Larvae Trapping Devices (MLTD) were used as ovitraps to collect mosquito larvae. These ovitraps were filled with nitrogen, phosphorus, and potassium (NPK) 5:5:5 organic fertiliser solutions as oviposition attractant and placed indoors and outdoors. Weekly samplings were conducted over 8 weeks and numbers of larvae were recorded. Species of larvae were identified using a stereo microscope or light microscope.

Results: In total, 2,152 *Aedes* larvae were collected consisting of *Ae. aegypti* and *Ae. albopictus* with a percentage of 14.36% and 85.64% larval abundance respectively. The mean number of indoor *Ae. aegypti* larvae per ovitrap (1.72 ± 0.38) exceeded the larvae found outdoors (0.86 ± 0.20). Meanwhile, the mean number of outdoor *Ae. albopictus* per ovitrap (9.28 ± 1.28) was higher than those found indoors (6.08 ± 1.00). There was a significant difference between indoor and outdoor larval abundance ($p=0.008$). Weekly Ovitrap Index throughout the study ranged from 30.00% to 93.33%. Furthermore, it was shown that larval abundance was directly correlated with temperature ($r=0.476$; $p=0.233$) and inversely correlated with relative humidity ($r=-0.476$; $p=0.233$).

Conclusion: Utilisation of ovitraps and NPK fertiliser solution to collect *Aedes* larvae is not only economical, but also provides a sustainable method for dengue vector surveillance. Meteorological and ovitrap data can be integrated into predictive modelling of dengue transmission risks. However, future studies with wider coverage using these ovitraps and attractant are needed to produce more promising outcomes for the surveillance of *Aedes* mosquitoes.

Keywords: *Aedes*, weather, ovitrap, MLTD, NPK fertiliser

Parental Awareness on the Risks Faced by their Children's Internet Usage

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Background and aim: Children nowadays have unlimited access to the Internet that could possibly harm them. Thus, this research aims to determine the parental awareness and action on the risks faced by their children's Internet usage and their association with the socio- demographic factors.

Materials and method: In this cross-sectional study, a total of 421 respondents with children aged 5-18 years old have been recruited to complete a 16-item modified validated questionnaire. Statistical analysis used were descriptive statistic and Chi-square test.

Results: The prevalence of parental awareness on the risks faced by their children's Internet usage in sample population was determined by the parents' worry. The three risks most parents worried about their children were that they might see sexually or violently explicit images on the Internet (n=411, 97.6%) and via mobile phone (n=408, 96.9%) followed by their children might become isolated from other people if spending too much time online (n=388, 92.2%). In terms of parental action, the largest proportion of parents (n=265, 73.4%) said that their child was not allowed to give out personal information and only a small percentage of parents do not allow their child to download or play music (n=67, 18.6%) and films (n=79, 21.9%). However, there was no significant association between parental awareness and action with socio-demographic factors.

Conclusion: This survey indicates that parents are aware about the Internet risks faced by their children. However, the low prevalence in some of the parental actions implies that further actions need to be taken to a safer and more effective use of the Internet in children.

Keywords: Parental, awareness, Internet, social media, children

The Significance of Antinuclear Antibody Titration and Pattern in Diagnosis of ANA-Related Autoimmune Rheumatic Diseases

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Background and aims: Antinuclear antibody (ANA) is usually associated with underlying autoimmune diseases, particularly in some rheumatic diseases that are collectively known as ANA-associated rheumatic diseases (AARD). However, ANA can also be detected in healthy individual. The aim of this study was to determine the correlation between ANA titration and pattern in diagnosis of AARD.

Materials and methods: A retrospective study was conducted involving 105 patients with positive ANA from 1st January 2018 until 31st December 2018. ANA titration and pattern were recorded for each patient. The relevant clinical data was collected from patient's clinical notes taken from Medical Records Department.

Results: The mean age of patients was 54 years \pm 16.79 years. Majority of the patients were female (84 versus 21). Eighteen patients were finally diagnosed as AARD with 14 of them were diagnosed as systemic lupus erythematosus. ANA titration of equal or more than 320 was noted to be significantly correlated with diagnosis of AARD ($p=0.001$). In terms of ANA pattern, homogeneous pattern was found to have significant association with the diagnosis of AARD ($p=0.01$).

Conclusion: ANA titration of 1:320 or more and homogeneous pattern was found to be important in determining the diagnosis of AARD.

Keywords: Antinuclear antibody, rheumatic diseases, systemic lupus erythematosus

The Effects of Kelulut Honey on Mitochondrial Bioenergetics and Phenotypic Characteristics in Autism Lymphoblastoid Cell Line

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Background and aims: There are growing studies associating autism-spectrum disorders with mitochondrial dysfunction and oxidative stress. However, little attention was given on the benefits of antioxidant intervention on mitochondrial function in autism. Therefore, this study aimed to determine the effects of kelulut honey (KH) as an antioxidant on mitochondrial bioenergetics and morphological characteristics in autism by using lymphoblastoid cell line (LCL) as a model.

Materials and methods: LCL derived from autism children (ALCL) and non autistic sibling (NALCL) was used to compare their mitochondrial membrane potential (MtMP), complex V (CV) activity, and mitochondrial morphological characteristics. The ALCL was treated with optimum dosage of KH (40µg/mL). MtMP was measured using JC-1 MtMP Flow Cytometry Assay Kit whereas CV activity measured by Electron Transport Chain CV Assay kit. Meanwhile, mitochondrial morphological characteristic was processed and viewed under scanning electron microscope (SEM).

Results: MtMP analysis showed a significant higher MtMP in ALCL compared to NALCL ($p < 0.05$). However, MtMP in KH-treated ALCL reduced significantly compared to untreated ALCL ($p < 0.05$). KH-treated ALCL also showed a significant lower in CV activity compared to untreated ALCL ($p < 0.05$). However, there was no significant difference in CV activity between ALCL and NALCL ($p > 0.05$). Scanning electron micrograph of isolated mitochondria from ALCL showed distortion with presence of blebs, depression, ridges and furrows throughout the longitudinal length of the mitochondria. However, NALCL and KH-treated ALCL showed oval-shaped mitochondria with smooth outer mitochondrial membrane without any distortions.

Conclusion: ALCL showed higher MtMP and different morphological characteristics compared to normal cells. However, CV activity between ALCL and NALCL showed no significant difference. Treatment with KH was able to restore the mitochondrial bioenergetics (MtMP and CV activity) and normal mitochondrial morphology in ALCL.

Keywords: Autism, honey, mitochondria, complex V, membrane potential

Cardiovascular Screening for Detection of Risk Factors for Premature Coronary Heart Disease and Sudden Cardiac Death among Universiti Kebangsaan Malaysia Students

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Background and aims: Coronary artery disease (CAD) is the most common pathology among autopsy cases of sudden cardiac death (SCD) in Malaysia. Recently, there has been an increase in incidence of individuals below age 50 presenting with acute coronary syndrome (ACS). This study examined the prevalence of risk factors for premature CAD and SCD and predicted the 30-year cardiovascular disease (CVD) risk among students of Universiti Kebangsaan Malaysia.

Materials and methods: Respondents were selected through convenient sampling, and an online questionnaire on demographics and CVD risk factors was taken. Later, health screening was conducted whereby body mass index (BMI), blood pressure, fasting blood glucose and total cholesterol levels were measured. Physical examination and electrocardiography were also done. The 30-year risk for CVD was calculated using Framingham BMI-based risk score.

Results: A total of 166 respondents were screened for CVD risk factors, aged 20 to 28 years with mean age of 22.2 years and 22.3% were males. Of the CVD risk factors, 39.1% were either overweight or obese, 36.1% had positive family history for premature CAD, 23.5% had dyslipidaemia, 18.1% had elevated fasting blood glucose and 9.6% had hypertension. The median 30-year hard and full CVD risk was 1% and 2%, respectively. Electrocardiogram abnormalities were found in 19.3% of the respondents, the commonest being frontal plane axis deviation and ST segment depression. Univariate analysis revealed a significant association between obesity ($p < 0.001$) and hypertension ($p < 0.001$) with 30-year CVD risk. No significant association was found between electrocardiogram abnormalities ($p = 0.159$) and the 30-year CVD risk.

Conclusion: Hypertension and obesity are significant risk factors, which correlate with the 30-year CVD risk among young individuals. Electrocardiogram abnormalities did not yield significant correlation with the 30-year CVD risk. Young individuals with pre-existing risk factors should be followed up and monitored closely.

Keywords: Cardiovascular diseases, electrocardiography, obesity, hypertension

Factors Affecting Quality of Life among Parents of Children with Learning Disabilities

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Background and aims: Having children with learning disabilities (LD) contributes greatly to the quality of life (QOL) of the parents. This study examined the factors affecting the QOL among parents of children with LD.

Materials and methods: A cross-sectional study was conducted among 380 parents of children with LD in online support groups. Sociodemographic profile, Parental Stress Scale (PSS), and Quality of Life (WHOQOL-BREF) were obtained.

Results: Parents of children with LD had good quality of life across all 4 domains-physical, psychological, social relationships, and environmental with median score of 69 (IQR=25), 69 (IQR=19), 69 (IQR=25), and 69 (IQR=19), respectively. There was significant association between gender and psychological health; male parents had higher quality of life with median score of 75 (IQR=25), $p=0.034$. Malay parents had significant higher QOL in environmental domain with median score of 69 (IQR=20.5), $p=0.013$. Being married was significantly associated with good QOL in social relationships domain with median score of 69 (IQR=25), $p=0.016$ and environmental domain with median score of 69 (IQR=19), $p=0.026$. Parents with tertiary education had significant higher QOL in physical, psychological and environmental domain with median score of 56 (IQR=20.5), 56 (IQR=25) and 63 (IQR=31) with $p=0.001$, $p=0.023$ and $p=0.003$, respectively. Household income groups had significant association with all 4 domains with $p<0.0001$, $p=0.001$, $p=0.004$ and $p<0.0001$, respectively. Only 9.5% of parents reported high-stress level. Parental stress had significant fair negative correlation with all 4 domains; physical ($p<0.0001$, $r=-0.392$), psychological ($p<0.0001$, $r=-0.432$), social relationships ($p<0.0001$, $r=-0.414$), environmental ($p<0.0001$, $r=-0.421$).

Conclusion: Parents who were female, non-Malays, single, having lower education level and high parental stress tend to have low QOL. Hence, social support and intervention should be focused towards these groups to improve their QOL in supporting their children with LD.

Keywords: Fathers, mothers, stress, quality of life, learning disabilities

Direct Medical Cost of Coronary Heart Disease and its Associated Factors in Universiti Kebangsaan Malaysia Medical Centre

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Background and aims: Coronary heart disease is the biggest contributor to the total death of non-communicable disease in Malaysia. The incidence has increased drastically over the past decades. This study aimed to determine the direct medical costs of coronary heart disease and its associated factors in Universiti Kebangsaan Malaysia Medical Centre (UKMMC).

Materials and methods: A retrospective study utilising secondary data from Casemix Unit, UKMMC was conducted among patients hospitalised for myocardial infarction (MI) and angina pectoris in 2018. The direct medical cost was measured based on the tariff (sum of costs incurred per patient) provided in Casemix data, comprising of medical ward fees, laboratory and radiological investigations, procedures, and medications. Associated factors, which influenced direct medical cost were determined, such as gender, age group, comorbidities, cardiovascular-related procedures, severity of illness and baseline lipid profile at admission.

Results: Among the sample size recruited (n=1317), 26.7% was known to have hyperlipidaemia prior to admission. Patients with angina pectoris accounted for the majority of admission (62.2%) and the remainder (37.8%) was myocardial infarction. The total direct cost of treating CHD events in 2018 in UKMMC was higher for angina patients (MYR 2,101,169.71) compared to MI patients (MYR 2,053,757.36). However, the average cost of treating MI patients was higher (MYR 4,124.01) compared to angina patients (MYR 2,565.53). Associated factors that were found to significantly affect the direct medical cost were male gender (p<0.001), age group above 40 years old (p=0.001), greater number of comorbidities (p<0.001), the type of cardiovascular-related procedures underwent (p<0.001), length of stay (p<0.001), and severity of illness (p<0.001).

Conclusion: Direct medical cost of CHD in 2018 incurred by UKMMC was substantial. A thorough assessment and management of patients' modifiable risk factors in clinical setting would assist to reduce the patient's medical costs.

Keywords: Economic burden, angina, myocardial infarct

To Evaluate the Clinical and Radiological Outcome of Selective Fusion In Lenke I and Lenke V Adolescent Idiopathic Scoliosis

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Background and aims: The Lenke classification developed since 2001 provides a reliable guide in selective fusion procedure, a known surgical intervention of scoliosis. This research aimed to study the outcome of selective fusion in Lenke I and Lenke V in terms of radiological and clinical findings.

Materials and methods: A retrospective study was conducted in Universiti Kebangsaan Malaysia Medical Centre (UKMMC) involving all Lenke I and Lenke V Adolescent Idiopathic Scoliosis (AIS) patients intervened by selective fusion from January 1, 2007 till December 31, 2017. Data collection was done by one-off basis using socio-demographic questionnaire and validated Malay version of Oswestry Disability Index (ODI). Patients' radiological findings for pre-operative and post-operative were retrieved from the medical record unit.

Results: Pearson correlation analysis showed poor positive linear correlation between the corrective rate of major curve and minor curve ($r=0.239$). The prevalence of patients who achieved the stable and satisfactory sagittal profile with a normal kyphosis angle (10° - 40°) was 80%, post-operatively. The mean score for ODI was 1.29 (Standard deviation [SD] = 0.508) which falls under the category of minimal disability.

Conclusion: Selective fusion is a better option for surgical intervention of scoliosis as evidenced by improvement of Cobb's angle post-operatively regardless of the ODI data collected. Hence, further studies should be conducted to evaluate other possible factors that may influence the functional outcome despite a successful selective fusion.

Keywords: Adolescence, scoliosis, Lenke Classification, Oswestry Disability Index (ODI), Cobb's angle

Improving Diagnostic Ability and Confidence in Otoscopy through a Web Based Learning Platform: A Prospective Interventional Study

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Background and aims: Otoscopy is an important clinical skill to master in the undergraduate medical curriculum. This study investigated the effect of a new web-based learning platform for otoscopy among final year medical undergraduates in Universiti Kebangsaan Malaysia Medical Centre (UKMMC).

Materials and methods: A new web-based learning platform for otoscopy was introduced to final year medical undergraduates who have completed a formal three-week posting in otorhinolaryngology. A total of 45 subjects who participated in the learning platform were included in this prospective interventional study. All of them answered questionnaires on level of confidence (LC) and completed online questions on diagnostic ability (DA) at three different timelines during the study: prior to intervention (T1), after intervention (T2) and 4 months following the intervention (T3).

Results: LC scores were significantly higher between T1 and other time lines measured: T1 vs T2 and T1 vs T3 respectively ($p < 0.05$). DA scores were significantly higher in between T1 and other timelines measured: T1 vs T2 and T1 vs T3, respectively ($p < 0.05$). LC and DA scores continued to improve at T3 with scores significantly higher when compared with scores at T2 ($p < 0.05$).

Conclusion: Subjects' level of confidence in performing otoscopy and diagnostic ability showed sustained improvements at 4 months with this intervention. We conclude that this otoscopy web-based learning platform compliments the teaching and learning of otoscopy among final year medical undergraduates.

Keywords: Otoscopy, web-based learning, medical education

Profiling of Patients With Onychomycoses and Dermatormycoses in Universiti Kebangsaan Malaysia Medical Centre: 2015 to 2018

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Background and aims: Onychomycoses and dermatormycoses are common infections. Profiling of positive cases offers valuable information in managing these cases. The main objective was to determine the prevalence of onychomycoses and dermatormycoses from 2015 to 2018. The specific objectives were to determine the profile of patients with onychomycoses and dermatormycoses, with respect to medical comorbidities and to identify the fungi responsible according to the patient profiles.

Materials and methods: In this retrospective study, a total of 756 fungal culture results of skin scrapings (SCs), skin biopsies and nail clippings (NCs) from the year 2015 to 2018 were collected. A total of 572 cases were positive. However, 128 cases were irretrievable and 31 were duplicate cases. Medical records of the 413 positive cases were requested and their respective comorbidities and supporting information were obtained.

Results: The mean age was 55.8 (\pm 19.1) years. There were 212 males (51.3%) and 199 (48.2%) females. The ethnicity consisted of 223 Malays (54.0%), 129 Chinese (31.2%), 52 Indians (12.6%), and 9 (2.2%) others. Majority of positive cases were from SCs (48.2%), followed by NCs (43.3%). Positive cases from skin biopsies were mostly *Talaromycesmarneffeii* (21.4%) and *Sporothrixschenckii* (21.4%). Majority of cases (90.8%) were positive for up to two organisms. The main genera of fungal organisms isolated in SCs and NCs were *Aspergillus*, *Candida*, *Penicillium*, *Trichosporon*. The genera isolated predominantly from SCs were *Trichophyton*, *Microsporum* and *Cladosporium*, while *Fusarium* was isolated predominantly from NCs. Out of the 142 diabetics, only 21 (14.8%) had solely diabetes, while the remaining 121 (85.2%) had diabetes and other comorbidities.

Conclusion: Profiling of cases had debunked the assumption that diabetes alone increases the risk for onychomycoses and dermatormycoses. Treatment of these fungal infections, especially moulds, would need revisions as they may be resistant to currently used antifungal agents.

Keywords: Fungal, skin, nails

Studying of Potential Role of Dental Pulp Stem Cells Conditioned Medium for Odontoblastic Differentiation of Wharton's Jelly Mesenchymal Stem Cells

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Background and aims: Dentures are commonly used to replace damaged teeth. However, it causes complications such as denture irritation and infection of implanted artificial tooth. Therefore, regeneration of functional bioengineered tooth using autologous or allogeneic alternative differentiated cells sources are thought to have a great potential in the future. This study investigated the potential of dental pulp stem cells (DPSCs) conditioned medium for odontoblastic differentiation of Wharton's jelly mesenchymal stem cells (WJMSCs).

Materials and methods: WJMSCs and DPSCs were isolated from healthy donors with informed consent. The DPSCs derived from healthy adult permanent first molars were cultured at high confluence prior to conditioned medium collection. The WJMSCs were cultured in six different treatments, with varying ratios of culture media to DPSCs-conditioned medium. MTT assay was used to measure the rate of proliferation of WJMSCs, while immunocytochemistry (ICC) double staining was utilised to detect the expression of dental matrix protein 1 (DMP- 1). The deposited calcium was detected and analysed via Alizarin-Red Staining (ARS).

Results: It was found that the proliferation of WJMSCs cultured under the mixture of complete medium & DPSCs conditioned medium was significantly lower than the control; presumably the cells started to exit proliferative state prior differentiation. In 14 days of induction, the cells in all treatment groups showed osteoblastic-like morphology. Calcium compound deposits were observed at day 7, 10 and 14 of differentiation suggesting that DPSCs conditioned medium could lead to osteoblastic/odontoblastic differentiation. However, none of the treatments showed DMP-1 expression at proteomic level.

Conclusion: In conclusion, DPSCs conditioned medium appeared as a potential odontoblastic induction approach for WJMSCs. To further investigate the stimulatory effects by DPSCs conditioned medium, specific signalling pathway need to be elucidated to enhance the differentiation efficiency.

Keywords: Odontoblast, Wharton's Jelly, mesenchymal stem cells, conditioned medium, dentures

Comparison Between Multiple Mini Interview and Panel Interview Based on Medical Students' Academic Performance and Characteristics

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Background and aims: The current practice of medical students' selection includes non- cognitive components such as interview and psychometric test in addition to academic components. This is due to the increasing numbers of applicants with excellent pre-university qualifications that exceed the places offered by medical schools. Multiple studies done showed mixed outcome, in terms of their future performances and characteristic. This study was to compare the academic performance and characteristics of medical students selected through the multiple mini interviews (MMI) and panel interview (PI).

Materials and methods: This cohort study was done among undergraduate medical students of Faculty of Medicine, Universiti Kebangsaan Malaysia Medical Centre (UKMMC) that underwent a selection process either through MMI or PI. An online questionnaire was distributed among the students which include students' demographic data, their academic results and personality test based on Big Five Theory.

Results: From 379 respondents, 52.2% was selected through MMI and 47.8% through PI. Female students comprising of 71.5% of the total respondents while 28.5% were male students. There was significant difference between the pre-university CGPA of students selected through MMI compared to PI ($t=2.803$, $p=0.005$). However, there was no significant difference between the students from MMI and PI in terms of Year 1 CGPA ($t=1.366$, $p=0.173$). Openness ($t=1.789$, $p=0.074$) and extraversion ($t=1.967$, $p=0.050$) personality traits showed significant differences between the MMI group compared to the PI group.

Conclusion: MMI may able to select medical students with higher pre-university performance compared to PI. However, this study showed that there were no differences in academic performance in Year 1 as there might be other factors that contribute to this finding. In terms of personality, MMI was able to select students with a higher degree of openness and extraversion traits that may assist them in their future education.

Keywords: Academic performance, school admission criteria, personality trait

Perception of Emergency Care and Length of Emergency Department Stay among Admitted Patients from the Semi Critical Zone Emergency Department Universiti Kebangsaan Malaysia Medical Centre: A Cross-Sectional Study

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Background and aims: Over the years, emergency departments (ED) are under growing pressure to provide care for more patients, resulting in overcrowding, longer waiting time and boarding of admitted patients. All these factors may contribute to patient dissatisfaction towards the service or care provided. Patient satisfaction and feedback are important tools used to evaluate and improve the healthcare system. This study aimed to explore the admitted patient's perception of emergency care received during their stay in semi-critical zone of a tertiary university hospital ED.

Materials and methods: A cross-sectional study was conducted among patients who presented to ED semi-critical zone, and were admitted to the general wards from 10th July 2019 to 28th August 2019. Data was collected using Emergency Department Patient Experience of Care (EDPEC) questionnaire. The outcomes measured were patient satisfaction towards ED length of stay (LOS), communication and treatment as well as the association between patient satisfaction and ED LOS.

Results: A total of 319 patients were recruited for this study. Median ED LOS was 9.38 hours (IQR 7.02, 12.75). The average mean score of patient perceptions towards waiting time, communication and treatment are 72.73, 54.83 and 42.72, respectively. Overall, 80.3% (n= 256) were satisfied, and 19.7% (n= 63) were unsatisfied with emergency care provided. About 93.7% of patient dissatisfaction occurred when the waiting time was 7 hours or more (n=59). ED LOS was significantly associated with patient satisfaction ($p=0.006$).

Conclusion: This study showed that patient's satisfaction level is related to the ED LOS and communication with the healthcare personnel with regards to the emergency care received. Efforts should be taken to reduce the admission time and improve the ED personnel to patient communication skills in order to provide a better care for the patients.

Keywords: Emergency department, patient satisfaction, length of stay

Comparison of Von Willebrand Factor Antigen Levels in Different Age Groups, Gender and Ethnicity in a Malaysian Population

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Background and aims: Von Willebrand factor (VWF) is crucial in blood coagulation, and its deficiency causes von Willebrand disease (VWD). Determination of normal reference range of VWF antigen levels (vWf:Ag) for local population is important to correctly diagnose VWD. This study aims to determine the vWf:Ag in different age group, gender and ethnicity among local population.

Materials and methods: Blood samples of 2.5ml were collected from 101 healthy individuals aged between 18-80 years in local population of all ethnicity. The age group was categorised into 18-40, 41-60 and 61-80 years old. The vWf:Ag levels were measured using Enzyme Linked Immunosorbent Assay (ELISA) method.

Results: The result showed that the mean vWf:Ag for all the subjects was $75.78 \pm 31.17\%$. The mean vWf:Ag was 66.99 ± 22.75 for the age group between 18 to 40 years, $71.72 \pm 31.06\%$ for 41 to 60 years and $88.52 \pm 35.03\%$ for 61 to 80 years. The mean vWf:Ag for male subjects was $76.62 \pm 35.50\%$, whereas female subjects was $75.41 \pm 29.32\%$. For ethnicity, Malay had mean value of $73.40 \pm 30.94\%$, Chinese had $87.82 \pm 29.72\%$, Indian had $88.90 \pm 54.16\%$, and meanwhile others had $63.38 \pm 38.44\%$. The comparison of the mean values between age groups indicated significant difference ($p < 0.05$) while gender and ethnicity were not statistically significant ($p > 0.05$).

Conclusion: The study showed that the mean of vWf:Ag level increased with age in our population. The mean \pm SD of vWf:Ag for all subjects showed values that differ from the universal normal range used in the interpretation of VWD suggesting the need to change the normal range for our population. Thus, this study serves as a preliminary data of von Willebrand factor profiles among the Malaysian population.

Keywords: Von Willebrand factor, coagulation factor, Von Willebrand disease, blood coagulation disorder

Admission Pattern and Outcomes of Elderly Patients Attending the Emergency Department of Urban Tertiary Care Hospital, Kuala Lumpur

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Background and aims: Elderly patients utilise the emergency department (ED) frequently. However, little is known regarding the pattern of ED admission that has focused on Malaysian elderly population. The current study aimed to evaluate the pattern of admission and outcomes of elderly patients attending ED of a university teaching hospital in Kuala Lumpur, Malaysia.

Materials and methods: A retrospective cross-sectional study was conducted over two months from July to August 2019 analysing of all elderly patients aged 60 years and above who attended the ED, Universiti Kebangsaan Malaysia Medical Centre. The data was retrieved from the carbon copies of ED clerking notes during January 2018. Variables collected included age, socio-demographics, clinical characteristics, and disposition outcomes. The study excluded transferred patients from other hospitals and patients with no documentation of disposition status. Multivariate logistic regression was performed to evaluate variables predicted for hospital admission.

Results: A total number of 1499 elderly patients were included. The median age of the patients was 71.00 (IQR 13.00) years old. The admission rate was 52.80%. The ED length of stay for admitted patients was 8.3 hours (IQR 9.70) hours as compared to non-admitted patients, 2.3 hours (IQR 4.40), $p < 0.001$. From multivariate regression analysis, factors significantly associated with admission were elderly patients age 70-79 years (OR 1.69, CI 1.24-2.30), urgent triage acuity (OR 0.53, CI 0.38-0.75), underlying diabetes (OR 1.31, CI 1.04-1.65), underlying malignancy (OR 1.82, CI 1.18-2.80), underlying renal disease (OR 1.67, CI 1.21-2.31) and patients presented with shortness of breath (OR 1.54, CI 1.16-2.04), fever (OR 1.37, CI 1.02-1.84) and chest pain (OR 1.56, CI 1.05-2.32).

Conclusion: Increase in admission rate among elderly patients causes a significant burden to public healthcare services. Therefore, service improvements need to occur consistently to ensure that healthcare needs of elderly patients are met.

Keywords: Admission, emergency health care, geriatric

Patient-Related Factors Affecting Patency of Brachiobasilic Fistula in Universiti Kebangsaan Malaysia Medical Centre

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Background and aims: As the population of patient that requires haemodialysis are expanding, many patients experience difficulty in maintaining a patent arteriovenous fistulas (AVF) access. Hence, brachiobasilic fistula (BBF) creation as a secondary vascular access for haemodialysis has become a common clinical practice. The study aimed to review our experience with transposed BBF and investigate on patient-related factors that influence the patency.

Materials and methods: A retrospective observational study was conducted in Universiti Kebangsaan Malaysia Medical Centre (UKMMC) using convenient sampling. Patients who underwent creation of BBF between January 2014, and December 2017 were analysed. Details on demographics, co-morbidities, and complications from surgery were recorded through patients' records and database. Data was analysed with Kaplan-Meier estimate and Log-Rank test of significance.

Results: A total of 169 patients were recruited in the study. Of these, 45.6% were males and 54.4% were females. The mean age was 61.1 years. A total of 61.5% of patients had history of previous fistula creation. Risk factor profiles were diabetes mellitus (DM) in 65.7%, hypertension in 84%, gout in 5.9%, coronary artery disease (CAD) in 17.8% and cerebrovascular accident (CVA) in 4.1%. Of these, 71.9% had no operative complication. Commonest complication was wound infection (7.5%), followed by haemorrhage or hematoma (6.8%), thrombosis (5.5%), stenosis (2.7%) and pseudoaneurysm (1.4%). Primary and secondary patencies were at 50.5% and 50.7% at 1 year and 46.2% and 43.2% at 2 years, respectively. There were no significant association of patient-related risk factor with primary and secondary patency of transposed BBF.

Conclusion: In conclusion, BBF remains a great option for challenging patients with relatively good patency and low operative complication rate. We emphasize that creation of vascular access in haemodialysis patient remains a continuous challenge for the vascular surgeon and the nephrologist.

Keywords: Arteriovenous shunt, comorbidity, vascular surgical procedures, patency

The Prevalence and Risk Factors of Chronic Scar Pain after Lower Segment Caesarean Section in Universiti Kebangsaan Malaysia Medical Centre

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Background and aims: Chronic scar pain (CSP) after surgery is often neglected. Lower Segment Caesarean Section (LSCS) is one of the commonest surgeries nowadays. However, the prevalence of CSP post LSCS in Malaysia was not well understood. This study aims to determine the prevalence, characteristics, and risk factors of CSP after LSCS in Universiti Kebangsaan Malaysia Medical Centre (UKMMC).

Materials and methods: In this cross-sectional study, a total of 268 women who had undergone LSCS in UKMMC from March to May 2018 were identified. These candidates were interviewed to answer a questionnaire via phone call. Subsequently, the prevalence and risk factors of CSP post LSCS were analysed using SPSS.

Results: A total of 205 (76.8%) responded to the phone call interview. Among these respondents, 32.2% had CSP post LSCS. CSP was more prevalent in respondents with pre-existing pain elsewhere prior to LSCS ($p < 0.001$) and those who had additional procedures performed due to intra-operative complications ($p = 0.038$). Other demography and peri-operative conditions showed no association with CSP. However, household income was significantly related, whereby the M40 group had a higher prevalence (40.9%) compared to others ($p = 0.001$). Social and cultural factors, including confinement practice showed no association with CSP. Among the 66 respondents who reported CSP post LSCS, majority described the pain as intermittent and sharp. On average, the pain started three months after LSCS. As high as 75.8% of them had pain limited to the scar with an average pain score of 2.95. The CSP interfered their daily activities in all aspects. However, only 10.6% had sought treatment, and none had consulted a pain specialist.

Conclusion: CSP after LSCS is very common, those who are affected need to be identified so that early referral to pain specialists can be made.

Keywords: Chronic pain, caesarean section, postoperative pain