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Study on In-depth Accident Investigation For Advanced Automatic Collision Notification System in Japan

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Background and Objectives: In Japan, 3,694 people (within 24 hours) were killed on roads in 2017. Comparing the number in 2016, it was decreased by 210 deaths and was the lowest number statistically counted by National Police Agency since 1949. However, there was still 1,000 deaths behind against the government target in 2020. Methods: Since 2000, Automatic Collision Notification called HELPNET have been in operation. In case of accidents, vehicles connected to HELPNET Call Center and sent GPS data of the collision spot. Since Nov. 2015, in addition of HELPNET, Advanced Automatic Collision Notification called D-Call Net was started by HEM-Net. Not only GPS data, but also EDR data are transmitted to HELPNET Call Center. Using them, the newly developed decision algorithm based on ITARDA accident data predicts occupant injury level. A HEMS doctor examines the result and go to the accident spot to treat injured occupants as soon as possible. Results: ITARDA started a joint research with HEM-Net on in-depth accident investigations of D-Call Net cases in order to pick up subjects of this system and to evaluate the decision algorithm. D-Call Net in-depth investigation was carried out at ITARDA Tokyo office with support of National Police Agency. ITARDA investigated about 60 cases for these 3 years. In this paper, some accident cases among them were introduced and studied. Conclusions: For D-Call Net system itself, the biggest issue was a waiting time for landing at a rendezvous point (R/P). This study revealed that another R/P will be needed for rapid treatment. To evaluate the decision algorithm, using all cases investigated, Under Triage rate and Over Triage rate were examined. Over Triage rate was satisfied the world target, however, Under Triage rate could not be evaluated because of lack of severe injured cases. This study should be continued to store the cases.

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Prediction of Quezon City EMS Personnel on Extremity Fracture Amongst the Trauma Patient Brought in at East Avenue Medical Center

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Background and Objectives: Different levels of EMS personnel exist in the Philippines. With no standard training or staffing requirements, it is always a problem in the country to start a national protocol that everyone can follow most especially in ambulance diversion protocols. East Avenue Medical Center receives many trauma cases daily being a trauma hospital and a government hospital as well. To determine how well QC EMS personnel predict extremity fracture amongst trauma patient they brought in at EAMC. • To determine percentage correctly diagnosed with fracture; • To determine the sensitivity and specificity of EMS personnel in predicting fracture; • To determine the factors associated with EMS personnel’s ability to diagnose fracture; • level of training of EMS personnel; • years in service of EMS personnel; • injuries seen to the patient. • mechanism of injury. Methods: Aside from PATOS data form, a separate questionnaire will be given to the EMS staff to get the level of training, years of service, prediction of EMS personnel and result of x-ray. Study population will be Quezon City EMS personnel that will bring trauma patients to EAMC. Exclusion: QC EMS volunteer group; Sampling Technique: systematic sampling; Outcome Variables: Mismatch; Statistical Analysis: Logistic Regression. Results: None at the moment. Conclusions: The study aims to be a guide in the training curriculum of EMS personnel. It will also helps the administrator in coming up a protocol when it comes to fractures whether patient can go directly to a trauma hospital or to an orthopedic center.

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Development & Effect of a Trauma Simulation Training Program For Emergency Residents

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Background and Objectives: Advanced Trauma Life Support® course has employed a variety of simulation modalities to improve trauma care worldwide. Since that time, a variety of strategies, techniques and courses have emerged. It is utmost important to assess trauma care performances through best evidence-based practice. The objective of this study was to develop and assess emergency residents to enhance their competencies in managing major trauma patients. Methods: Full-day course was developed by the Education Committee of the Korean Society of Emergency Medicine using Kern’s 6-step approach. Flipped learning was applied, where lecture was provided through online pre-recorded lectures, and group discussion on site to test the participants’ knowledge competencies. Scenario-based simulation exercise involved managing major trauma patients. Warming-up scenario was performed in the beginning of the course to assess the participants’ baseline competencies. Four different scenarios were consecutively performed for repetitive practice and mastery learning, and then ended with final scenario assessment. Post-survey questionnaire was used to evaluate the course and assess the perception changes of the participants. All pre-to-post differences within subjects were analyzed with paired t tests. Minimal passing score (MPS) was decided using modified Angoff method. Results: Total of 138 residents participated in nine separate courses. The competencies for major trauma care improved from pre-to post-course (51.1% to 85.1%). The difference was statistically significant (p<0.05). MPS for the assessment was 75%. Overall course satisfaction in average for expectation, time, delivery method, and contents were 9.0, 8.6, 9.6, and 8.8, respectively. Conclusions: There needs to be assessment methods to recognize gaps of systems in place for trauma care. Scenario-based simulation can be an ideal tool for this purpose. Although this was only a single-day intensive course, we were able to assess the development of competencies by mastery learning and flipped learning method.

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Injury Patterns and Interaction with Near-side and Far-side Passengers in Motor Vehicle Side Collisions

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Background and Objectives: The objective of this study is to determine how the injury pattern and interaction between near and far side occupants in motor vehicle side collisions is different. Methods: This study was conducted as a retrospective study. We have determined that the first column of the CDC (Collision Deformation Classification) code is 09-11 or 02-04 as a side collision. We have defined passengers only when there are passengers in the same row. We analyzed data of side collision registered in KIDAS (Korea In-Depth Accident Study) database from Jan 2011 to Jul 2017. Results: ISS (Injury Severity Score, median [IQR]) of the near side occupants was 5 [2-13], which was higher than the 3 [2-9] of the far side occupants (p<0.05). The rate of serious injury (> AIS3) in thoracic injury and lower limb injury in near side occupants were 46.8% and 22.0%,which was higher than 30.2% and 4.5% in far side occupants (p<0.05). The median of head injuries in the absence of a passenger was 2 [1-2], which was higher than 1 [1-2] in the presence of a passenger (p<0.05). However, when only the far side occupants was analyzed, the median of abdominal injuries in the presence of a passenger was 1.5 [1-2], which was higher than 1 [1-1] in the absence of a passenger (p<0.05). The multiple logistic regression showed that severe injury in the side collision was 2.5 times higher in near side collision than in far side collision (p<0.05). Conclusions: The near-side occupant has a higher severity of chest and lower limb injury than the far-side occupant in motor vehicle side collisions. The severity of head injury is higher in the absence of a passenger regardless of the near and far side collisions, and the severity of abdominal injury is higher in the presence of a passenger in the far side collisions.

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Is a Higher Body Mass Index Protective Against Mortality From Gunshot Wounds?
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Background and Objectives: Penetrating trauma to the chest and abdomen is a major cause of traumatic death. We have previously seen patients with a larger body mass index (BMI) do well after sustaining gunshot wound (GSW) injuries that did not penetrate the central chest or abdominal cavities. This study aimed to determine if patients with higher BMIs with isolated GSWs to the chest or abdomen were less likely to have a longer Intensive Care Unit (ICU) stay, or suffer mortality in the immediate post-GSW period than patients with a lower BMI. Methods: We conducted a retrospective review of our trauma registry for patients seen between June 2012 and June 2017 who sustained GSW injuries to the chest, abdomen or pelvis. Only patients with completed BMI data were included. We divided these patients into those with a BMI of 25 or greater and those with a BMI of 24.9 or less. Independent samples t-test, ANOVA, Pearson’s correlation and P-values were calculated. Results: There were 2,715 total GSW cases in the trauma registry for patients seen between June 2012 and June 2017 that met criteria. 528 of these cases had complete BMI data. There was no association between BMI and mortality (p=0.230). We also found no association between BMI and ICU stay (r=0.067, p=0.123). There was likewise no association between BMI and ISS (r=-0.049, p=0.263). There was also no association between BMI and EMS time-on-scene (r=0.062, p=0.153). There were only 14 suicide patients in this subset, and there was no significant difference in BMI between these patients and non-suicidal patients (p=0.215). Conclusions: In patients who sustained GSW to their chest or abdomen, we found no association between BMI and ICU length of stay or in-hospital mortality.

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The Efficacy of Modified Focused Assessment with Sonography For Trauma
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Background and Objectives: Focused assessment with sonography for trauma (FAST) is routinely used in evaluating the patients with major trauma. After primary survey, the existence of hemoperitoneum or hemopericardium must be searched with FAST. Traditionally, hemopericardium can be assessed through the subcostal approach with the round probe for the abdomen. However, the satisfying images (4 chamber view) can be hardly obtained with this approach. Methods: This was a prospective, single-center study of an academic tertiary medical center. When we perform the FAST to the patients, traditional FAST (subcostal approach with the round probe) was performed. During the FAST examination, we recorded the consumed time, numeric rating scale (NRS) for pain, success rate of the satisfying images. After then, we used the round probe like echo probe. The round probe is positioned beside the left nipple with the probe marker opposite-sided (modified FAST) like the parasternal long axis view of echocardiography. Finally, existence of hemopericardium was confirmed with the echo probe. We compared the consumed time, NRS, success rate of the satisfying images. Results: Consumed time was shorter (45.3 vs. 80.5 sec, p<0.001) and the pain score was lower (0.4 vs. 4.6, p<0.001) when used the modified FAST compared to the traditional FAST. The satisfying images were obtained in 6 cases (20%) with the traditional FAST. When applying the modified FAST, satisfying images were obtained in 28 cases (93.3%). Conclusions: The modified FAST is more accurate for the detection of hemopericardium. The pain was less severe and the consumed time was shorter.

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Dynamic Simulation Modelling of Trauma in a UK Emergency Department: a Novel Quality-Improvement Collaborative Study
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Background and Objectives: In preparation for the first Welsh Major Trauma Network, emergency department (ED) response to trauma requires evaluation. Using engineering principles and simulation models, this study will assess trauma care efficiency in a UK-based ED. Methods: Prospective data was collected over a 3-month period (Dec-Feb 2018) in the ED of a large university teaching hospital in South Wales, UK. The inclusion criteria included any patient over 18 years presenting to an ED area (Resuscitation, Majors, Minors, Streaming and Ambulatory) that could be followed prospectively from point of admission to discharge. Data included ‘longitudinal’ information (patient journeys) and ‘horizontal’ information (staffing levels and system breaches). Analysis included statistics and computer-generated patient flow models. Results: Forty-two (38.9%) trauma cases were compared with 66 non-trauma cases. Average time in the department for trauma was 278 minutes (n=66, SD2(6.4) vs. 199 minutes for non-trauma (n=42, SD 29.6; p=0.050, 95% CI (0.143-157.6)). Inter-area analysis revealed longer waits for trauma patients at assessment and investigation. Median time for trauma patient assessment in Streaming was 163 minutes (n=2, IQR 137.5-188.5) compared to non-trauma assessment at 37 minutes (n=9, IQR 25.0-53.0; p=0.034). Streaming also revealed longer radiology waits for trauma of 160 minutes (n=2, IQR 155.5-164.5) than for non-trauma at 27 minutes (n=6, IQR 24.0-48.8; p=0.044). Process charting revealed that minor and major trauma patients are managed with similar high efficiency, but major trauma patients experience more review and discharge delays. Conclusions: Overall trauma care in the Welsh ED appears efficient. Delays are more evident in major trauma and occur at the latter stages of a patient’s journey. Variation exists between trauma and non-trauma process times in Resus and Streaming, which should be investigated further. ED efficiency data has wider implications for healthcare management and patient care.

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Fluid Resuscitation and Mortality among Trauma Patients Presenting to a Teaching Hospital in Rwanda
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Background and Objectives: Injuries cause significant morbidity and mortality in sub-Saharan African countries such as Rwanda. These burdens may be compounded by limited access to intravenous (IV) resuscitation fluids such as crystalloids and blood products. This study evaluates the association between fluid resuscitation and mortality outcomes at the University Teaching Hospital-Kigali (UTH-K), the primary trauma receiving center in Rwanda. Methods: Data were abstracted using a structured protocol for a random sample of Emergency Department (ED) patients treated between 2013 and 2016. Non-trauma and those under 15 years of age were excluded. Data collected included demographics, clinical presentation, mechanism of injury, type of fluid resuscitation received and facilities-based mortality. The primary outcome of interest was facility-based mortality. Descriptive statistics were used to explore characteristics of the population. Kampala Trauma Scores (KTS) were calculated and used to control for injury severity. Magnitudes of effects were quantified using multivariable regression models to yield adjusted odds ratios (aOR) with 95% confidence intervals (CI). Results: From the random sample of 1,630 cases, 991 trauma patients were studied. The median age was 32 [IQR 26, 46] and 74.27% were male. ED fluid resuscitation was given to 50.1% of patients with 43.59% receiving crystalloid and 6.46% crystalloid and blood transfusions. The median KTS score was 13 [IQR 12, 13]. After controlling for KTS score, age, and time period mortality likelihood was increased in those that received crystalloid (aOR=6.59, 95% CI 1.98, 21.95, p=0.002) and blood plus crystalloid (aOR=10.14, 95% CI 2.37,43.36, p=0.002) as compared to trauma patients not treated with IV resuscitation fluids. Conclusions: Injured ED patients treated with IV fluids and blood products had higher mortality, which may be due to unmeasured confounding factors or properties of the therapies provided. These findings suggest a need for further studies regarding fluid resuscitation in trauma populations in Rwanda.

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Association Between Shockable Rhythm Conversion and Outcomes in Patients with Out-of-hospital Cardiac Arrest and Initial Non-shockable Rhythm, According to the Cause of Cardiac Arrest
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Background and Objectives: Shockable rhythm conversion is associated with good neurologic prognoses in patients with out-of-hospital cardiac arrest (OHCA) and an initial non-shockable rhythm. We investigated whether conversion to shockable rhythm is associated with good neurologic outcomes, according to the cause of cardiac arrest. Methods: We conducted a nationwide, population-based, cohort study including OHCA data of the Korea Centers for Disease Control and Prevention database during 2012–2016. The primary outcome was good neurologic outcome at hospital discharge, defined as a cerebral performance category score of 1 or 2. We analysed the effect of conversion to a shockable rhythm for outcomes according to cause of cardiac arrest. Results: Of 114,628 patients with an initial non-shockable rhythm, 25,042 (21.8%) experienced conversion to a shockable rhythm; 83,437 (72.8%) had cardiac arrest due to medical cause and 31,191 (27.2%) due to non-medical cause. After adjustment for confounders, for medical causes, adjusted odds ratios (ORs) of conversion for survival to discharge and good neurologic outcome were 1.459 (95% confidence interval [CI] 1.344–1.583) and 1.789 (95% CI 1.586–2.019), respectively. For non-medical causes, the ORs of conversion for survival to discharge and good neurologic outcomes were 0.950 (95% CI 0.769–1.173) and 0.644 (95% CI 0.572–1.114), respectively. Conclusions: In a nationwide OHCA database cohort, patients with an initial non-shockable rhythm who converted to a shockable rhythm had better neurologic outcomes than did without conversion. However, in patients with OHCA due to a non-medical cause, conversion was not associated with better outcomes.
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Examination of Cases of Out-of-hospital Cardiac Arrest in Older People Transported to Tertiary Emergency Medical Institution in Osaka
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Background and Objectives: In Japan, the aging of population is progressing remarkably, and as a result elderly people who are emergency transported by out-of-hospital cardiac arrest are increasing, but consideration on the actual condition of out-of-hospital cardiac arrest of elderly people is poor. To study the patient background and outcome of elderly patients out-of-hospital cardiac arrest carried to tertiary emergency medical institution in Osaka Prefecture. Methods: 4636 cases of cardiogenic out-of-hospital cardiac arrest of 18 years or older who was transported to tertiary emergency medical institution in Osaka prefecture from June 2012 to December 2016. The subjects were divided into four groups of (1) 18 to 64 years old, (2) 65 to 74 years old, (3) 75 to 84 years old, and (4) 85 years old or over, and examined the patient background and survival outcome . The primary endpoint was the neurological outcome after 30 days [Cerebral Performance Category Scale (CPC) 1 to 2]. Results: The breakdown of the 4 groups was as follows: (1) 1,290 patients (27.8%), (2) 1,102 patients (23.8%), (3) 1,420 patients (30.6%), and (4) 824 patients (17.8%). The neurological outcome after 30 days (CPC1, 2) was (1) 207 patients (16.0%), (2) 96 patients (8.7%), (3) 60 patients (4.2%), (4) 7 patients (0.85%). When multivariate analysis was conducted with a confounding factor against a good neurological outcome after 30 days, age increase was significantly a factor of poor prognosis (p<0.001). Conclusions: We studied cases of out-of-hospital cardiac arrest in the elderly who were transported to tertiary emergency medical institution in Osaka Prefecture. Further examinations are needed for the elderly patients who are out-of-hospital cardiac arrest. Corresponding Author: Fumiko Nakamura (whomeco.68@gmail.com)

Apnoic Oxygenation Was Associated with Decreased Desaturation Rates During Rapid Sequence Intubation in Multiple Australian and New Zealand Emergency Departments
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Background and Objectives: Rapid sequence intubation (RSI) in patients with critical illness or injury carries significant potential complications, with the incidence of desaturation being the most common. The technique of Apnoic Oxygenation (ApOx) has been demonstrated to reduce the incidence of desaturation although evidence of benefit has been conflicting. Aim: The aim of this study was to compare the incidence of desaturation between patients who received ApOx, as recorded in the Australia and New Zealand Emergency Department Airway Registry (ANZEDAR) study. Methods: We investigated the data from ANZEDAR (n=3,710) which was collected over 24 months. This study is a retrospective analysis of prospectively collected ANZEDAR database of patient demographics, indication of intubation, oxygenation devices and techniques and patient complications from 43 EDs. To evaluate the effect of ApOx on patient desaturation, we fitted a binomial logistic regression model. Results: Applying the selection criteria to the ANZEDAR database 2,519 intubations were analyzed, 1,669 (66.3%) patients received ApOx while 850 (33.7%) did not. Desaturation in the ApOx cohort was 10.4% compared to standard care 13.7%. ApOx had a protective effect for desaturation (OR = 0.72 95% CI 0.54-0.97). Each intubation attempt was associated with increased risk of desaturation (OR = 2.06 95% CI 1.32-3.22). When a difficult airway was anticipated OR of desaturation was 1.89 (95% CI 1.35-2.48). Conclusions: Conclusion: This multicentre study using data collected in real world practice, provides evidence supporting the use of ApOx to reduce the incidence of desaturation in ED RSI. ApOx is a pragmatic intervention utilising readily available equipment. The greatest benefits are seen in the anticipated difficult airway failing first intubation attempt –thus we support the use of ApOx in all ED patients requiring RSI.
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Time to Epinephrine Treatment Is Associated with the Risk of Death in Children Who Achieve Sustained ROSC After Traumatic Out-of-hospital Cardiac Arrest
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Background and Objectives: The benefits of early epinephrine for non-traumatic out-of-hospital cardiac arrest (OHCA) children have been reported; however, in traumatic OHCA, the benefits of early epinephrine remain unclear. Since the volume-related pharmacokinetics of epinephrine may differ vastly between hemorrhagic shock (HS) and non-HS conditions, beneficial and harmful effects from non-selective adrenergic stimulation may be enhanced upon early administration. In this study, we aimed to analyze the outcomes of children with traumatic OHCA (with HS or non-HS) according to different timing to epinephrine. Methods: This was a multiple-center retrospective study (2003-2014). Children with traumatic OHCA who received epinephrine during resuscitation were included. All children were classified into HS and non-HS groups. Demographics, patient outcomes, hemodynamics after sustained return of spontaneous circulation (ROSC) and survival durations were analyzed and correlated with different timing to epinephrine (Minutes: Early<15, intermediate 15-30, late>30) in both groups. Cox regression analysis was used to identify risk factors for mortality. Results: A total of 509 children were included. The majority were HS OHCA (n=348, 68.4%). Early epinephrine was implemented in 131 (25.4%) subjects. Early epinephrine increased the chance of sustained ROSC in both the HS and non-HS group (both p<0.05), but was not related to survival or improved neurologic outcomes. However, early epinephrine in the HS group led to increased cardiac output but more metabolic acidosis and lower urine output (all p<0.05). Cox regression analysis showed increased risk of death only in this specific group (HS plus early epinephrine, HR: 5.22, 95% CI: 2.45-11.2). Conclusions: Early epinephrine increased the likelihood of sustained ROSC in children with traumatic OHCA (both HS and non-HS group). As for children with traumatic OHCA and HS, early epinephrine had enhanced beneficial effects (increased cardiac output) but also harmful effects (lower urine output and more metabolic acidosis), ultimately resulting in increased risk of death.

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Rapid sequence intubation (RSI) in patients with out-of-hospital cardiac arrest (OHCA) or cardiac arrest due to cardiogenic out-of-hospital cardiac arrest of 18 years or older, (2) 65 to 74 years old, (3) 75 to 84 years old, and (4) 85 years old or over, was performed in 2,519 cases from 2012 to 2016. The primary endpoint was the neurological outcome at hospital discharge, defined as a cerebral performance category score of 1 or 2. The incidence of desaturation (SpO2 < 90%) was compared between patients who received ApOx and those who did not. Desaturation rates were lower in the ApOx group, with an adjusted odds ratio of 0.72 (95% CI 0.54-0.97). Each intubation attempt was associated with an increased risk of desaturation (OR = 2.06 95% CI 1.32-3.22). When a difficult airway was anticipated, the odds of desaturation were 1.89 (95% CI 1.35-2.48). Conclusions: This multicentre study using real-world data collected in a national database provides evidence supporting the use of ApOx to reduce the incidence of desaturation in ED RSI. ApOx is a pragmatic intervention utilising readily available equipment. The greatest benefits are seen in the anticipated difficult airway failing first intubation attempt - thus we support the use of ApOx in all ED patients requiring RSI.

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Impact of Age-Adjusted Charlson Comorbidity on Hospital Survival and Short-Term Outcome of Patients with Extracorporeal Cardiopulmonary Resuscitation

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Background and Objectives: ECPR has gradually come to be regarded as an effective therapy, but the hospital mortality rate after ECPR is still high and unpredictable. The present study tested whether age-adjusted Charlson comorbidity index (ACCI) can be used as an objective selection criterion to ensure the most efficient utilization of medical resources. Methods: Adult, ECPR at our institution between 2006 and 2015 were included. Data regarding ECPR events and ACCI characteristics were collected immediately after the ECMO setup. The primary endpoint was survival to hospital discharge. The second endpoint was the short-term (2-year) follow-up outcome. A total of 461 patients included in the study were grouped into low (ACCI 0-3) (240, 52.1%) and high ACCI (ACCI 4-13) (221, 47.9%) groups. The median ACCI was 2 (IQR: 1-3) and 5 (IQR: 4-7) for the low and high ACCI groups, respectively. CPR-to-ECMO duration was comparable between the groups. Results: Hospital survival rate: 55.5% died on ECMO support. 44.5% were successfully weaned off ECMO, but only 138 patients (29.9%) survived to hospital discharge (32.1% and 27.6% in low and high ACCI group, p=0.291). Multivariable logistic regression analysis revealed CPR-to-ECMO duration and a CPR cause of septic shock to be significant risk factors for hospital survival after ECPR (p=0.043 and 0.014, respectively), whereas age and ACCI were not (p=0.334 and 0.164, respectively). The 2-year survival rate after hospital discharge for the 138 hospital survivors was 96% and 74% in the low and high ACCI groups, respectively (p=0.002). Conclusions: High ACCI before ECPR does not predict a poor outcome of hospital survival. Therefore, ECPR should not be rejected solely due to high ACCI. However, high ACCI in hospital survivors is associated with a higher 2-year mortality rate than low ACCI, and patients with high ACCI should be closely followed up.

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Delta Neutrophil Index as an Early Predictive Marker of Severe Acute Pancreatitis in the Emergency Department

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Background and Objectives: Early prediction of severe acute pancreatitis (SAP) is important to reduce morbidity and mortality. The delta neutrophil index (DNI) has been used to investigate inflammation and infection. However, no previous studies have evaluated whether the DNI is useful as an early predictor of progression to SAP. Methods: Patients with AP admitted to the emergency department at Wonju Severance Christian Hospital from January 2012 to August 2016 were retrospectively evaluated. The DNI was initially investigated at admission and its ability to predict SAP was compared to that of other inflammatory markers. Multivariable logistic regression analysis was used to identify predictors of SAP. Results: Of the 209 patients included, 13 were classified as having SAP. DNI was significantly higher in the SAP group than in the mild to moderately severe AP group. DNI was positively correlated with the Atlanta classification and bedside index of severity in AP. A multivariable logistic regression analysis showed DNI was an independent predictor of early SAP detection (odds ratio 1.122, 95% CI: 1.045-1.205, p=0.001). DNI showed the highest predictive value for SAP among the biomarkers evaluated. Conclusions: DNI measured during ED admission is potentially useful as an adjunctive marker to predict SAP.

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Characteristics Predicting Clinically Severe Diverticulitis in the Emergency Department Where Right Colon Diverticulitis is Dominant

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Background and Objectives: Practice guidelines of diverticulitis have been developed in countries where right colon diverticulitis is dominant and there is limited information considering right colon diverticulitis. The goal of this study is to identify clinical characteristics and risk factors of clinically severe diverticulitis in a population where right colon diverticulitis is dominant. Methods: Retrospective chart review of patients diagnosed diverticulitis in the emergency department from 2013 to 2017 was performed. Clinically severe diverticulitis was defined as any cause of death, ICU admission, surgery or invasive intervention because of diverticulitis and 7 or more hospital days before discharge. To identify risk factors for clinically severe diverticulitis, we used multivariable binary logistic regression. Subsequently we searched for risk factors for clinically severe disease including patients with right colon diverticulitis only. Results: We analyzed 337 patients with 63 patients in the clinically severe group. Patients with older age (odds ratio [OR]=1.047, 95% confidence interval [CI]=1.019-1.076), left sided disease (OR=4.158, 95% CI=1.336-12.938), complications observed on CT (OR=2.987, 95% CI=2.911-16.340), symptom of anorexia (OR=6.515, 95% CI=1.934-21.948), rebound tenderness on physical examination (OR=2.726, 95% CI=1.217-6.105), high ALP (OR=1.017, 95% CI=1.006-1.029), CRP levels (OR=1.124, 95% CI=1.061-1.191) were at higher risk of clinically severe diverticulitis. Right colon diverticulitis was separately analyzed results were similar excluding anorexia (OR=3.718 95% CI=0.965-14.322, p=0.056). Conclusions: Among patients diagnosed diverticulitis in the ED, patients with old age, left colon disease, distinct complications on CT, anorexia, rebound tenderness on physical examination, high ALP, and high CRP levels are at risk of clinically severe disease.

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Derivation of an Emergency Prediction Model For Mortality: a Prospective Study

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Background and Objectives: Practice guidelines of diverticulitis have been developed in countries where right colon diverticulitis is dominant and there is limited information considering right colon diverticulitis. The goal of this study is to identify clinical characteristics and risk factors of clinically severe diverticulitis in a population where right colon diverticulitis is dominant. Methods: Retrospective chart review of patients diagnosed diverticulitis in the emergency department from 2013 to 2017 was performed. Clinically severe diverticulitis was defined as any cause of death, ICU admission, surgery or invasive intervention because of diverticulitis and 7 or more hospital days before discharge. To identify risk factors for clinically severe diverticulitis, we used multivariable binary logistic regression. Subsequently we searched for risk factors for clinically severe disease including patients with right colon diverticulitis only. Results: We analyzed 337 patients with 63 patients in the clinically severe group. Patients with older age (odds ratio [OR]=1.047, 95% confidence interval [CI]=1.019-1.076), left sided disease (OR=4.158, 95% CI=1.336-12.938), complications observed on CT (OR=2.987, 95% CI=2.911-16.340), symptom of anorexia (OR=6.515, 95% CI=1.934-21.948), rebound tenderness on physical examination (OR=2.726, 95% CI=1.217-6.105), high ALP (OR=1.017, 95% CI=1.006-1.029), CRP levels (OR=1.124, 95% CI=1.061-1.191) were at higher risk of clinically severe diverticulitis. Right colon diverticulitis was separately analyzed results were similar excluding anorexia (OR=3.718 95% CI=0.965-14.322, p=0.056). Conclusions: Among patients diagnosed diverticulitis in the ED, patients with old age, left colon disease, distinct complications on CT, anorexia, rebound tenderness on physical examination, high ALP, and high CRP levels are at risk of clinically severe disease.

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**Dynamic Computed Tomography, Prior to Colonoscopy, For Colonic Diverticular Bleeding**

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**Background and Objectives:** Colonic diverticular bleeding is one of the most critical causes of lower gastrointestinal bleeding. Due to continuous bleeding, blood pressure sometimes falls and massive blood transfusion is needed. Identification of the source of colonic diverticular bleeding is very important to treat and it is often difficult because diverticulums are usually multiple and temporarily in the condition of hemostasis. We investigated whether dynamic computed tomography (CT) on arrival at the hospital, prior to colonoscopy, is helpful to identify and treat colonic diverticular bleeding in our emergency and critical care center. **Methods:** We conducted a review of the data of 46 patients who were diagnosed as having colonic diverticular bleeding between July 2010 until August 2018. The patients consisted of 33 males and 13 females, with an average age of 70.0 years. Dynamic CT had been performed on arrival on 46 of 46 patients (n=40), and they were divided into two groups according to whether extravasation was detected (extravasation group, n=14) or not (non-extravasation group, n=26) with CT. **Results:** The interval time between hemorrhagic stool and Dynamic CT in the patient of extravasation group (median 4.25 hours) was significantly shorter in that of non-extravasation group (median 8.5 hours). The identification rate of the source of colonic diverticular bleeding by the first colonoscopy was 79% in the extravasation group and 38% in the non-extravasation group. **Conclusions:** To identify and stop colonic diverticular bleeding by colonoscopy, earlier performance of dynamic CT in the patient on arrival, prior to colonoscopy, is recommended.

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**FS_MED_01_06**

**Enteral Feeding in High-flow Therapy For Infants with Bronchiolitis: Secondary Analysis of a Randomized Trial**

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**Background and Objectives:** Nasal high-flow oxygen therapy is increasingly used for respiratory failure in infants with bronchiolitis. It is unclear if children receiving high flow can be safely fed enteraly. **Methods:** We performed a preplanned secondary analysis of a multi-center, randomized controlled trial of 1,472 infants aged <12 months with bronchiolitis and an oxygen requirement. Children were assigned to treatment with either high-flow or standard-oxygen therapy with optional rescue high-flow. For a subgroup we assessed how children on high-flow therapy were hydrated and fed; intravenously (IV), via bolus or continuous nasogastric tube (NGT) or orally. Secondary outcomes included adverse events while receiving enteral feeding. **Results:** 505 patients (mean age 5.8 months, female 186 [36.8%]) on high-flow via primary study assignment (n=408), or as rescue therapy (n=97) were included. While on high-flow, 15 of 505 (3.0%) received only IV fluids, 360 (71.3%) received only enteral feeds, and 93 (18.4%) received both IV and enteral feeds. 453 infants were enteral fed at some stage during their treatment on high-flow. Of these, 90 (18.5%) received NGT bolus, 217 (43.0%) NGT continuous, 118 (23.4%) both bolus and continuous, 32 (6.3%) received only oral feeds and 171 (33.9%) a mix of NGT and oral feeds. None of the patients receiving oral or NGT feeding on high-flow sustained pulmonary aspiration (0%; 95% Cl 0% to 0.8%); one patient had a pneumothorax (0.2%; 95% Cl 0% to 1.2%). **Conclusions:** In children with bronchiolitis treated with HF, enteral feeding using either oral or NGT route was safe.

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**FS_MED_01_07**

**Comparing the Predictive Accuracy of Pneumonia Severity Index and CURB65 in Patients with Community Acquired Pneumonia in a Developing Country**

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**Background and Objectives:** Community-acquired pneumonia (CAP) is a significant cause of morbidity and mortality globally, and is ten (10) times more common in developing countries. Severity prediction models such as the pneumonia severity index (PSI) and CURB-65 are used to complement physician assessment and improve patient outcome. This study aimed to evaluate the accuracy of these two tools to predict 30-day mortality and the need for ICU and HDU admission in patients with CAP. **Methods:** A retrospective observational study was conducted on patients with CAP who attended the Adult Emergency Department of a tertiary hospital in Trinidad from January 1st, 2013 to December 31st, 2013. **Results:** In total 402 patients were enrolled in the study. The 30-day mortality rate was 10.2%. There was no significant difference in the predictive accuracy of PSI (AUROC = 0.808) compared with CURB-65 (AUROC = 0.803) for 30-day mortality (p > 0.001). Both scores showed high sensitivity at low risk cut-off points (100%, PSI class 1; 100% CURB-65 score 0). CURB-65 was more specific at high-risk scores compared with PSI (86% vs. 64%). Both the PSI and the CURB65 had poor discriminatory value to predict the need for ICU and HDU admission. There was an increased risk of 30-day mortality in patients with pleural effusions (adjusted OR 7.34, 95% CI 1.84-29.32, p = 0.005) and bilateral lung infiltrates (adjusted OR 3.52, 95% CI 1.13-10.99, p = 0.030) on chest x-ray. **Conclusions:** The PSI and CURB-65 risk scores were both reliable and accurate tools used for severity classification and mortality prediction in Trinidadian patients with CAP. However, due to its simplicity, CURB-65 may be more easily applicable in the Emergency Department. Patients with pleural effusions and bilateral lung infiltrates should be considered for inpatient management because of the increased risk of 30-day mortality demonstrated in this study.

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Background and Objectives: Pulmonary embolism (PE) carries a mortality of approx. 4% and a risk of serious non-fatal adverse events (SAE) of 2.5% (approx.). There has been a move in recent years towards outpatient management of low risk PE. Previously there was only one validated risk score—the Pulmonary Embolism Severity Index (PESI). Recently a new score has been derived, the HOPPE score. Its components are blood pressure, paO2 and ECG analysis. It has had limited validation. The aims of this study were to validate the HOPPE PE risk score in ED diagnosed PE and to determine its clinical performance for the prediction of SAE. Methods: This was a retrospective observational study by medical records review conducted at Sunshine and Footscray Hospitals ED. Participants were all patients with an ED diagnosis of pulmonary embolism between 1 January 2014 and 30 June 2017. We collected data on demographics, clinical features, ECG, right ventricular function, SAE and mortality. As SpO2 is more commonly measured than arterial blood gas, we replaced paO2 with SpO2, defining the HOPPE SpO2 score. The outcome of interest was clinical predictive performance of the HOPPE-SpO2 score for mortality and SAE. Results: 206 patients were studied. In-hospital mortality was 2% and SAE occurred in 13%. With respect to mortality, the HOPPE-SpO2 score was 100% sensitive with 100% negative predictive value (NPV). Regarding SAE, HOPPE-SpO2 score was 96% sensitive with 98% NPV. Predictive performance was similar to the sPESI score. Application of the HOPPE-SpO2 score would allow 28% of patients to be treated as outpatients. Conclusions: HOPPE-SpO2 is easy to apply from data readily available in ED. It appears to have similar clinical accuracy to sPESI for both mortality and SAE. It may allow a quarter of patients with PE to be treated as outpatients.

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Impact of High Emergency Department Occupancy on Time to Physician Initial Assessment: A Traffic Theory Analysis
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Background and Objectives: Emergency Department (ED) congestion threatens quality care in most countries. ED efficiency measures traditionally use census and wait times over extended time intervals (e.g. per year, per day), missing crucial hourly variations in flow. Borrowing from traffic theory describing cars on a freeway, we calculated near-instantaneous ED measures of flux, density, and duration. Here we examined the association between stretcher occupancy and time to physician initial assessment (PIA), seeking thresholds where flux and PIA deteriorate. Methods: We used administrative data for 115,559 ED visits from April 1, 2014 to March 31, 2016 at a tertiary academic hospital. Time stamps at triage, PIA, and departure were verified and used to define two care segments: awaiting assessment or receiving care. We calculated flux (patients traversing a care segment per unit time), density (patients in a care segment per unit time) and duration (length of stay in a care segment) for each segment at 90-minute intervals with open-source software developed in-house. Graphical analysis was supplemented by regression analysis, examining PIA times of high (CTAS 1-3) or low (CTAS 4-5) acuity patients against ED occupancy (= density/staffed stretchers) adjusting for day of week, season and fiscal year. Results: Below 50% occupancy, PIA times are stable and flux increases with density, reflecting free flow. Above 50% occupancy, PIA times increase linearly and flux plateaus, indicating congestion. As PIA times further deteriorate above 100% occupancy, flow is maintained, reflecting care delivery in non-traditional spaces (e.g. hallways). An inflection point where flux decreased with increased crowding was not identified. Conclusions: ED performance can be characterized using traffic engineering techniques. Unlike jammed roadways, ED care continues despite substantial crowding. Yet congestion begins well below 100% occupancy, revealing saturated subsegmental work processes and the need for stretcher turnover. This methodology shows promise to analyze and mitigate the pervasive factors contributing to ED crowding.

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Early Warning Score2 (NEWS2) to prognosticate in-hospital mortality within 24 hours and the need of life-saving intervention at the emergency department. **Methods:** A single-center prospective observational study was conducted in Chonburi hospital, a tertiary-care center, over a month. We enrolled all adult patients admitted to the hospital. Their physiologic parameters were recorded at the beginning of treatment to the time of admission. NEWS2 was subsequently calculated into initial NEWS2 and final NEWS2. Logistic regression models and the Area Under Receiver Operating Characteristic (AUROC) quantified the association between outcomes and NEWS2. **Results:** 407 patients were enrolled to the study. For initial NEWS2, it was a better predictor for the need of life-saving intervention (RR 2.05; 95% CI 1.77-2.37, p<0.001) which the AUROC was 0.91 (95% CI 0.88-0.94, p<0.001). While final NEWS2 was a better predictor for in-hospital mortality (RR 2.07; 95% CI 1.6-2.68, p<0.001) which the AUROC was 0.94 (95% CI 0.90-0.97, p<0.05). Additionally, A final NEWS2 of 5 or more exhibited a sensitivity of 100% and a specificity of 71.9% to detect in-hospital mortality within 24 hours. Same as the initial NEWS2 of 5 or more showed a sensitivity of 90.4% and a specificity of 91.2% to predict the need of life-saving intervention. **Conclusion:** NEWS2 is a fundamental and practical tool of healthcare providers for both identifying patients at risk from clinical deterioration who may need life-saving intervention and also predicting in-hospital mortality within 24 hours.

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**Applying Lean Strategy to Reduce Turnaround Time of Laboratory Tests in Emergency Department**

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**Background and Objectives:** Emergency department (ED) physicians relied on timely lab results to confirm diagnosis, to exclude suspicion, and to avoid pitfalls. Delays in report delivery led to delayed diagnosis increased waiting time and decreased patient satisfaction. Short turnaround time (TAT) of laboratory tests can optimize ED throughout by reducing the length of stay (LOS) and improving patient outcomes. Here we implemented a lean strategy to reduce TAT of laboratory tests in ED of a tertiary care center in Taiwan. **Methods:** Retrospective analysis of ED encounters from electronic medical records was performed. Laboratory TAT data over a nine-month period were analyzed before and after the implementation of the lean methodology. Employee satisfactions regarding the lean process were also assessed. We analyzed the current state of our ED laboratory tests process using lean tools and techniques and were able to identify 6 major non-value added activities.

**Results:** The number of laboratory tests in ED of a tertiary care center in Taiwan.

**Conclusions:** The number of laboratory tests in ED of a tertiary care center in Taiwan. Improving lean tools and techniques and were able to identify 6 major non-value added activities:

- Delays in report delivery lead to delayed diagnosis increased waiting time and decreased patient satisfaction.
- Short turnaround time (TAT) of laboratory tests can optimize ED throughout by reducing the length of stay (LOS) and improving patient outcomes.
- Here we implemented a lean strategy to reduce TAT of laboratory tests in ED of a tertiary care center in Taiwan.

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**FS_ADM_01_05**

**Scribes in Emergency Medicine: a Multi-centre, Randomised Trial Evaluating the Impact of Scribes on Emergency Doctor Productivity and Patient Throughput**

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**Background and Objectives:** We aimed to evaluate the productivity and throughput changes when Emergency Physicians in Emergency Departments in Australia used scribes. This is the first multi-centre randomised emergency scribe study.

**Methods:** Setting: Five emergency departments in Victoria, Australia. Sites represented typical Australian emergency departments: public (urban; tertiary; regional referral; paediatric); private, not-for-profit. Participants: The 88 salaried participating physicians were either emergency consultants or senior registrars in their final year of training. Twelve scribes were trained at one site and rotated to each study site. Interventions: Physicians worked their routine shifts and were randomly allocated to scribed shifts (23,838 patients). Scribes increased physician productivity from 1.13 (95% CI 1.11, 1.16) to 1.31 (95% CI 1.25, 1.38) patients per hour per doctor, (15.9% gain). Primary consultations increased from 0.83 (95% CI 0.81, 0.85) to 1.04 (0.98, 1.11) patients per hour per doctor, (25.6% gain). There was no change in door-to-doctor time. Median length of stay reduced from 192 minutes (IQR 108, 311) to 173 minutes (IQR 96, 208), representing a 19-minute reduction (p<0.001).

The greatest gains were achieved by placing scribes with senior doctors at triage, the least by utilising them in subacute/fast-track regions. No significant harm involving scribes was reported. The cost-benefit analysis based on productivity and throughput gains demonstrated a favourable financial position with scribe utilisation. Trial registration-prospective registrations: ACTRN12615000607572 (pilot site), ACTRN1261600018459. **Conclusions:** Scribes improve emergency physician productivity, particularly during primary consultations and decrease patient length of stay. Further work should evaluate the role of the scribe in countries with health systems similar to Australia.

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**FS_ADM_01_06**

**Beyond Evidence of Association: How Crowding Metrics Perform as Quality Indicators, a QICA Analysis**

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**Background and Objectives:** Most Emergency Department (ED) crowding measures reflect efficiency and timeliness of care, although fewer reflect safety and effectiveness of care. Which metrics are best suited to be used as performance measures has not been determined. The Quality Indicator Critical Appraisal (QICA) Tool is a checklist that considers all attributes of a quality indicator. **Methods:** The QICA tool was used to assess crowding metrics. The evidence of associations with quality of care, the technical characteristics of the indicator (acceptability, reliability, power and precision, cost of measuring and propensity for unintended consequences) along with practicalities of data collection, responsiveness and whether the metrics reflected both ED and system performance were considered. To facilitate comparisons between metrics, an overall score was determined for each one, and this allowed a comparison of the strength of recommendations either for or against using the metrics as quality indicators. **Results:** After appraisal of each metric using the QICA tool, there was a strong recommendation that ED Length of Stay (LOS) should be used, with a conditional recommendation for using total ED Occupancy and Hospital Occupancy. There were also conditional recommendations that Time to Assessment, Boarding Time and ED Length of Stay should not be used and strong recommendations either for or against using the metrics as quality indicators.

**Conclusions:** ED length of stay is the metric associated with most quality domains and best satisfies the requirements of a good quality indicator.

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**FS_ADM_01_07**

**How Effective is Cleaning of High-touch Surfaces in the Emergency Department?**

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**Background and Objectives:** We aimed to evaluate the productivity and throughout changes when Emergency Physicians in Emergency Departments in Australia used scribes. This is the first multi-centre randomised emergency scribe study. **Methods:** Setting: Five emergency departments in Victoria, Australia. Sites represented typical Australian emergency departments: public (urban; tertiary; regional referral; paediatric); private, not-for-profit. Participants: The 88 salaried participating physicians were either emergency consultants or senior registrars in their final year of training. Twelve scribes were trained at one site and rotated to each study site. Interventions: Physicians worked their routine shifts and were randomly allocated to scribed shifts from November 2015 to January 2018. Main outcome measures: Physician productivity (total patients, primary patients); patient throughput (door-to-doctor time, length of stay); ED region physician productivity. Self-reported harms of scribes were analysed and a cost-benefit analysis was undertaken. **Results:** Data were collected from 589 scribed shifts (5,098 patients) and 3,296 non-scribed shifts (23,838 patients). Scribes increased physician productivity from 1.13 (95% CI 1.11, 1.16) to 1.31 (95% CI 1.25, 1.38) patients per hour per doctor, (15.9% gain). Primary consultations increased from 0.83 (95% CI 0.81, 0.85) to 1.04 (0.98, 1.11) patients per hour per doctor, (25.6% gain). There was no change in door-to-doctor time. Median length of stay reduced from 192 minutes (IQR 108, 311) to 173 minutes (IQR 96, 208), representing a 19-minute reduction (p<0.001).

The greatest gains were achieved by placing scribes with senior doctors at triage, the least by utilising them in subacute/fast-track regions. No significant harm involving scribes was reported. The cost-benefit analysis based on productivity and throughput gains demonstrated a favourable financial position with scribe utilisation. Trial registration-prospective registrations: ACTRN12615000607572 (pilot site), ACTRN1261600018459. **Conclusions:** Scribes improve emergency physician productivity, particularly during primary consultations and decrease patient length of stay. Further work should evaluate the role of the scribe in countries with health systems similar to Australia.

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Background and Objectives: The role of environmental surface contamination in transmitting hospital-acquired infections is well established. A total aerobic colony count (ACC) of <2.5 colony forming units (cfu/cm²) has been used as a standard for cleanliness, against which contamination should be evaluated by sampling surfaces in a targeted fashion. Touch frequency is one such targeting method shown to be associated with degree of contamination and cleaning requirements. However, this has rarely been quantified in the emergency department (ED) setting. Methods: Right-sided patient trolley-rails (Stryker Model 1037 Transport Stretcher, Stryker Corporation, Kalamazoo, MI) were identified as the most frequently touched surface by visual counting among all surfaces in the ED. We applied a standardized protocol for microbial sampling and culturing by swabbing the entire 1,120 cm² surface area of the corresponding rails on all available trolleys with standard sterile sponge swabs in the same direction before plating on tryptic soy agar with 5% sheep blood and BBLTM CHROMagar® II. All trolleys were sampled after routine wiping with Virex® II 256 using a microfibre cloth; those used by MRSA-colonised patients were additionally disinfected using Clorox. The primary end-point was total ACC. The secondary end-point was methicillin-resistant Staphylococcus aureus (MRSA) colony counts. Results: From surveillance camera footage review over a consecutive 2-hour period, right-sided patient trolley-rails constituted the highest touch frequency of 56 times per hour and the longest touch duration of 1,744 seconds per hour. All 96 patient trolley-rails in active circulation in the ED during the sampling period were included. The mean ACC was 1.18 (standard deviation 2.94) cfu/cm² (95% CI 0.012 to 0.060 cfu/cm²) but none exceeded the 2.5 cfu/cm² cleanliness threshold. Conclusions: Cleanliness of the ED, represented by a high-touch surface, may not be satisfactory.

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Predicting Inpatient Mortality at the Emergency Department

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Background and Objectives: Inpatient mortality may be avoided or alleviated by accurate risk prediction and we could allocate limited resources appropriately to high-risk patients. The objective of this study is to identify risk factors for inpatient mortality using data from ED and then use this highly-related factor to create a model which could predict future risk for patients from ED in their inpatient stay. We further used state-of-art machine learning methods for improving the model predictive power. Methods: This is a retrospective observational study using data extracted from the hospital’s electronic health records (EHR) for all patients released on or before admission during the period of interest. Logistic regression analysis shows that for each 100-unit (d.s.cm⁻⁵ or d.s.cm⁻⁵.m) increase in SVR or SVRI, 30-day mortality decreases by 8.6% (95% CI 0.8%-15.8%, p < 0.05) and 5.8% (95% CI 1.2%-10.3%, p < 0.05) respectively. Conclusions: USCOM-derived CO and SVR correlated with shock in the ED, and SVR and SVRI in particular predicts 30-day mortality. USCOM may have a role in detecting shock and risk stratification in the ED.

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Implementation of One-Hour Rule For the Boarding of Referral of Critically Ill Patients in Emergency Department

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Background and Objectives: Prolong boarding time of critically ill patients in emergency department (ED) is associated with adverse outcomes for patients and increased mortality. In 2018, Taiwan Ministry of Health and Welfare setup a regional electronic referral system in the central of Taiwan to streamline patients transfer from intensive care unit (ICU) of regional hospital to medical hospital center. Moreover, one-hour rule for boarding of the referral of ICU patients in ED was implemented. Our aim is to assess the impact of one-hour rule on ED functioning and patient outcomes. Methods: A retrospective study was conducted in a single academic medical hospital center. Patients referred from ICU of regional hospital were collected from Jan 2018 to Dec 2018. The main outcomes included ED length of stay (LOS) and 24-hour, 7-day, 14-day, and 30-day mortality were compared between achieved target patients and delay boarding patients. We also determined the hospital interventions to achieve the one-hour target. Results: Forty-one adult patients were enrolled. The mean age was 69 years old. Infectious disease (34.1%) and respiratory failure (24.4%) accounted for the majority of reasons for referral. Twenty-seven (66%) patients transferred to ICU within 1 hour of ED arrival. Compared with delay boarding group, the achieved target group had shorter ED LOS (45 minutes vs. 213.5 minutes, p < 0.001) and lower mortality rate (22.2% vs. 28.6%, p = 0.303). No significant different in 24-hour, 7-day, 14-day, and 30-day mortality between groups. Hospital interventions including active bed management before patient arrival and no requirement for laboratory test result to be complete prior to admission were used to streamline patient flow in ED.

Conclusions: Implementation of one-hour rule for the boarding of referral of critically ill patients in ED is safe and possible. Achieved the target significantly reduced ED LOS without increased mortality rate.

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Circulating Toll-like Receptors Gene Signature as Biomarkers of Sepsis in the Emergency Department

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Validation of a Biosensor Device For Vital Sign Monitoring in Septic Emergency Department Patients in Rwanda

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Background and Objectives: Sepsis is “life-threatening organ dysfunction due to dysregulated host responses to infection”. Toll-like receptors (TLRs) are proteins that play a key role in the immune system’s response to infection. Thus, TLRs may act as early markers to identify patients at high risk of sepsis. We aimed to investigate circulating TLRs gene signatures in Emergency Department (ED) patients at high risk of developing sepsis. Methods: This is single-centre, prospective study conducted in the ED of Prince of Wales Hospital, HK (July to September 2017). Patients presented with suspected infection were recruited. Blood samples were collected and buffy coat TLR mRNA levels were measured by real-time polymerase chain reaction (PCR). Beta-2-Microglobulin (B2M) was used as a control gene. Results: Among 67 patients recruited (median age 69 years, IQR:56-84; 46.3% male), we analyzed TLR gene signatures in 21 infection patients and 13 sepsis patients (regardless of whether a pathogen was detected or not). We recruited 10 inflammatory disease patient controls and 10 healthy controls (HC). Median buffy coat TLR3 mRNA levels were lower in sepsis patients compared with infection, gout and HC groups (0.26 vs. 1.67 vs. 1.15 vs. 1.25 ng/mg B2M, p<0.05). Higher TLR-7 levels were found in infection patients than in the gout and HC groups (0.46 vs. 0.28 vs. 0.30 ng/mg B2M, p<0.05), whereas lower TLR-9 levels were found in sepsis than infection and HC groups (0.015 vs. 0.034 vs. 0.025 ng/mg B2M, p<0.05). Receiver operator curve analysis of TLR-3,-7 & -9 for discriminating sepsis and non-sepsis patients (non-sepsis infection and gout groups), the areas under the curve (AUC) were 0.82, 0.61 and 0.68 respectively. The combination of TLR-3,-7,-9 gene expression demonstrated the largest AUC:0.94. Conclusions: TLRs mRNA signatures in buffy coat vary among different pathological conditions and has the potential to be an early marker to identify patients at high risk of development of sepsis. Combinations of TLR-3,-7 & -9 could further improve the diagnostic potential of the prediction of sepsis development.

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The Long-distance Interhospital Ground Transfer of Critically Ill Patients in Mongolia

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Background and Objectives: Mongolia has geographical specialty, sparse population and extreme climatic conditions, and winter temperatures -25°C to -40°C, which limits air transportation and helicopters. These regional hospitals cannot provide the specialized assistance, such as critical care due to the inadequate diagnostic tools and manpower. It is necessary to transport many patients, who are in these hospitals to the central hospitals. Objective: To assess the safety of long-distance ground interhospital transport of critically ill patients after establishment of a dedicated transport system. Methods: Retrospective, observational study. We included all critically ill patients (n=42), who were transported by our service from ICUs elsewhere in Mongolia to the main tertiary hospitals (5) in Ulaanbaatar during the 1, 5 years (2017–2018). Results: 40 critically ill patients with an average age of 48 (8-85) were included in this study. The mean transfer distance was 423 km (80-800 km). The long-distance ground transport of all cases 10 (25) is transported in the winter and the temperatures were -25°C to -40°C. The mean winter transfer distance was 487 km and eight patients who had a mechanical ventilation, vasopressors or unconsciousness were transported on average 7 hours. About 25 percent of all patients were severe unstable or mechanically ventilated, up to FiO2 0.5 in PEEP ≥ 5 cm Hg or vasopressors used. Those severe patients were transported an average of 497 km within 8.2 hours. All patients were transported successfully to the five tertiary hospitals of UB. Conclusion: It is safe to transport the critically ill patients by ground transport up to average 423 km and 7 hours driving with customized ambulance vehicles. The patient safety were secured by continuous monitoring and intensive care support delivered by the team specialized in Intensive Care Medicine.

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Pattern Recognition of Abnormal Physiology in the Emergency Department

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Background and Objectives: To develop a prototypical shape-based visual representation of physiological patterns found in chest pain, trauma and sepsis patients, and test their applicability in the clinical context. Methods: An observational descriptive cohort pilot study was performed on patients presenting to a major Australian metropolitan tertiary hospital ED with chest pain, suspected sepsis or trauma. Patient physiology (blood pressure, heart rate, respiratory rate, oxygen saturation, temperature) was plotted on radar charts and derived shapes were qualitatively compared to sets of example shapes from the MARCS Institute. Shape detection, quantitative analytical methods including cluster analysis, generalised additive model analysis and dimensionality reduction analysis were applied to verify findings. Results: In total, 885 shapes were analysed, identifying a typical ‘south-west pointing diamond shape’ across all patients with suspected sepsis, regardless of disposition and outcome. No representative shapes were found for chest pain and trauma patients but shape configuration responded to analgesia and fluid resuscitation. Conclusions: Prototype shapes were making small but important physiological differences more obvious. Dimensionality reduction methods comparing with derived shapes verifies the possibility of incorporating shape-based pattern recognition into machine learning devices. Corresponding Author: Paul Middleton (Paul.Middleton@health.nsw.gov.au)
Internal and External Validation of Li’s Pragmatic Shock: a Prospective Study

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Background and Objectives: The accuracy of diagnosing shock in the ED is generally poor and associated with poor outcomes. Li’s Pragmatic Shock (LiPS) tool has been developed to aid shock assessment but has never been validated. The aim of this study was to validate the LiPS tool. Methods: In a prospective, longitudinal study conducted in the EDs in Hong Kong and Cardiff, adult patients aged ≥18 years, were recruited. Derivation (N=108) and internal validation (N=158) sets were taken from Hong Kong and the external validation dataset (N=361) was from Cardiff. The LiPS tool, which included pH, base deficit, lactate, blood pressure, level of consciousness, skin colour and temperature, was internally and externally validated using multivariable logistic regression and bootstrapping. The primary outcome was combined 30-day mortality or ICU admission. Results: In the derivation set, the odds ratio (OR) for probable shock associated with combined outcome was 7.63 (95% CI 3.05 to 19.07); p value <0.0001; area under the receiver operating curve (AUC) 0.718 (0.623 to 0.800); Youden Index (YI) 0.44 (0.25 to 0.60); sensitivity and specificity were 60.00 (42.1-76.1) and 85.36 (73.0-91.2). In the internal validation set, the OR was 3.65 (95% CI 1.74 to 7.66); p value 0.0007; AUC 0.636 (0.554 to 0.712); YI 0.27 (0.13 to 0.44); sensitivity and specificity were 46.15 (34.62 to 63.46) and 81.00 (72.00 to 87.00). In the external validation set, the OR was 1.84 (95% CI 1.07 to 3.19); p value 0.0359; AUC 0.567 (0.509 to 0.62); YI 0.13 (0.02 to 0.26); sensitivity and specificity were 40.00 (25.00 to 60.00); sensitivity and specificity were 60.00 (42.1-76.1) and 83.56 (73.0-91.2). Conclusions: The LiPS model identified probable shock following ED attendance but accuracy was moderate.

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Determination of the Best Early Warning Scores to Predict Important Outcomes among Emergency Department Patients

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Background and Objectives: Early Warning Scores (EWS) are used to predict outcomes in patients. We aimed to determine which of 13 EWS, based on Emergen- cy Department (ED) vital sign data, best predicted important clinical outcomes. Methods: We undertook a prospective cohort study in a metropolitan tertiary-referral ED (February-April 2018). Patient demographics and vital sign data were collected while the patients were in the ED and EWS scores were calculated on each EWS criteria. Outcome data were collected after 28 days (mortality within 2, 7, and 28 days of admission; clinical deterioration within 2 days; ICU admission within 2 days; admission to hospital). Area under the Receiver Operator Characteristic curve (AUROC [95% Confidence intervals]) was used to evaluate the predictive ability of each EWS for each outcome measure. Results: Of 1,730 patients enrolled, 690 patients were admitted to the study hospital. Most EWS were good or excellent predictors of mortality at 2 days post admission. The VitalPac Early Warning Score (VIEWS) was the most strongly predictive (0.96 [0.92-0.99]). The Abbreviated ViEWS (AbViEWS) and National Early Warning Score (NEWS) were also strongly predictive (0.95 [0.92-0.98] and 0.95 [0.91-0.99], respectively). Predictive ability of mortality was generally less at 7 and 28 days post admission. No EWS performed as a good predictor for clinical deterioration (AUROC range 0.54-0.70), ICU admission (range 0.51-0.72) or admission to hospital (range 0.51-0.68). Conclusions: VIEWS, AbViEWS and NEWS were excellent predictive of mortality, especially within 2 days. No score adequately predicted clinical deterioration, admission to either ICU or the hospital.

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The Importance of International Drills of EMTs For the Expected Nankai Trough Earthquake and Tsunami

Joji Tomoika

Background and Objectives: The probability of a magnitude 8 or 9 earthquakes occurring in the Nankai Trough area within 30 years will be 70 to 80 percent. In this earthquake, it is pointed out that up to 320,000 deaths, 620,000 injured people, and more than 9.5 million evacuees may occur. At that time, can Japan rescue victims without international collaboration? Methods: According to past researches, the number of disaster medical assistance team (DMAT) in Japan which required for the Nankai Trough Earthquake is estimated to be 1,400 to 2,800. However, it is estimated that DMAT that can move immediately will be about 600 teams. Results: Thus, we should need the help of foreign medical teams from all over the world. Japan has dispatched various medical teams to disasters that have occurred abroad. But, on the other hand, we are not used to accepting international medical teams. In the Great East Japan Earthquake, there were a lot of offers for dispatching of rescue teams and medical teams from many countries, but it is hard to say that we accepted well. Eight years passed after that, the disaster medical system in Japan has been gradually reviewed, but acceptance of the medical team from abroad is still not well considered. Conclusions: For that purpose, it is necessary to establish an EMT acceptance system at the central government and to create the system that prefec- tural health care adjustment headquarters will fulfill the functions of EMT Coordination Cell (EMT-CC) and international simulations and training are essential.

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Development & Effect of a Pandemic Disaster Training Program For Healthcare Providers From Designated Hospitals For Infectious Patient

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Background and Objectives: To mitigate the threat posed by infectious outbreak, the Ministry of Health and Center for Disease Control in Korea designated hospi- tals to be responsible for managing any suspected or confirmed infectious patient. These hospitals receive mandatory training in managing infectious patients, but many of the training lack practical skills practice and pandemic preparedness ex- ercise. The objective of this study was to develop and evaluate training course to train healthcare providers from designated hospitals to enhance their competen- cies in managing emerging new infectious disease and potential outbreak. Methods: Two-day course was developed by the Center for Disaster Relief, Training, and Research in collaboration with the Korea Health Promotion Institute using Kern’s 6-step approach. The course consisted of didactic lectures, technical skills training, table-top simulation, and scenario-based simulation. Table-top simulation exercise consisted of cases involving a single infectious patient detected in the outpatient clinic and outbreak in the emergency department. Scenario-based simulation exercise involved managing a critically ill infectious patient in an iso- lated ward. Post-survey questionnaire was used to evaluate the course and assess the perception changes of the participants. All pre-to-post differences within sub- jects were analyzed with paired t tests. Results: Total of 121 healthcare providers participated in three separate courses. The competencies for pandemic prepared- ness knowledge, skills, and attitude improved from pre-to post-course. The differ- ences were all statistically significant (p<0.05). Overall course satisfaction in av- erage for expectation, time, delivery method, and contents were 9.5, 9.2, 9.4, and 9.2, respectively. Conclusions: There needs to be test and exercises to recognize gaps of systems in place for pandemic preparedness. Simulation exercises is an ideal tool for this purpose. Although this was only a two-day intensive course, this increased familiarity with workflows, tested the coordination of workflows be- tween different disciplines and allowed the identification of gaps.

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An Epidemiological Study of Disaster in Taiwan During 2009-2016

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Background and Objectives: Taiwan is prone to be influenced by many disasters. There are not only rooms for improvement but also experiences to be learned from these events. This study analyzed the injury pattern and resources utilization
of disaster victims in recent decade. **Methods:** Emergency Medical Resources Management System (EMRMS) started around 2003 under the supervision of department of health, one of its initial purposes was patient tracking and medical resources utilization for disasters/mass casualty incidents (MCIs). The reporting items, definitions, and classifications have been revised with compatible to Centre for Research on the Epidemiology of Disasters (EM-DAT) in 2009. Data in National Disaster Registry from EMRMS for disaster casualties since 2009 to 2016 were retrieved and analyzed. SAS 9.4 and Excel were used for biostatistics. **Results:** There were 902 events reported. A total of 34,949 victims including 477 deaths and 3,610 hospital admission were enrolled. In average, there were 9.4 disasters/MI ces per month. The annual morbidity for all cases was 18.5 per million. The leading types of events were food poisoning (33%), traffic incidents (31%), fire/explosion (9%), mass gathering (8%) and hazmat (7%). About 36% of the patients were sent by 119 ambulances, while the other 60% of patients were self transported. After treatment in ER, 85% patients were discharged from ER, 0.5% received surgery, 8% admitted to general wards, 2% to ICU, and 1% transferred, and 1.4% died in ER. Nearly 30% of patients in fire incidents required admission, followed by traffic (18%) and flood (14%). The aged population has higher rate for admission (19%) in comparing to adults (10%) and children (5%). **Conclusions:** Our results provide an empirical evidence on guiding the preparedness and prevention of disaster in Taiwan. The ER and hospitals should have new models for disasters/MCIs to minimize the disruption of ER operation. **Corresponding Author:** Fu-Huan Shih (fystone@ntuh.gov.tw)

**A Survey to Measure the Surge Capacity of Hospitals in New Delhi, India**
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**Background and Objectives:** Disasters and infectious disease outbreaks over the last several years have demonstrated the importance of emergency preparedness in hospitals to deal with large scale events affecting many people. The ability to respond effectively to events producing a massive influx of patients that disrupt daily operations requires Surge Capacity. Key components of surge capacity include the four S’s: ‘staff’, ‘stuff’, ‘structure’, and ‘systems.’ **Methods:** In this Survey a set of Questions asked and the inference drawn about how a well a Hospital is prepared to accept and treat a sudden surge of patients. **Results:** The data were collected from the different hospitals in New Delhi. The hospitals were randomly selected by the NDMA and it included both the Government Hospitals and Private hospitals. **Conclusions:** The Survey to measure the Surge Capacity of Hospitals in New Delhi has given a concerning result. Although there are many large multispecialty hospitals in New Delhi, yet the Surge capacity of the hospitals is very less. The hospitals are overburdened and the inflow of sick and injured patients is always on the rise. To conclude I put forward the thought that Surge Capacity concept still needs more research work and more collaboration from the public and political field in order to establish and extend the capacity of hospitals to deal with Disaster. **Corresponding Author:** Indranil Das (drindradas@gmail.com)

**Humanitarian Relief Mission For Palu Earthquake: Role of Emergency Doctors as Forward Medical Team During Disaster**
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**Background and Objectives:** A 7.4 richter scale earthquake hit Palu of Indonesia on 28th September 2018. It was one of the worst disaster that ever hit Sulawesi with more than 4,000 confirmed dead and more than 10,000 missing. Emergency response and relief effort during this phase poses huge challenges. The objectives are 1) To provide medical treatment through forward medical team and field hospital. 2) To establish mental health and psycho-social support network at ground zero. **Methods:** A team under Non-Government Organization (NGO) named IMARET, consisting of an Emergency Physician, Emergency Medical Officers and Psychiatrist flew to Palu. The team operated at ground zero for 9 days to provide medical treatment, logistic support and psychological first aid. The work was conducted in partnership with local NGO named Red Crescent Indonesia with permission of Indonesian National Board for Disaster Management. The field hospital located in district Sigi, one of the worst hit area 13 km from Palu City. Forward medical team traveled an hour and half deep into peripheries to provide medical and psychological treatment. **Results:** More than 150 patients per day visited the field hospital. Many of whom came with psychosomatic symptoms and post traumatic injuries requiring psychological and trauma first aid. Forward medical team went to multiple affected sites within 50 km radius of the field hospital and detected many untreated trauma patients with fractures who was later transferred to tertiary hospital by our team. Psychological first aid sessions conducted mainly to children and mothers with Post traumatic stress disorder symptoms (PTSD). **Conclusions:** Emergency doctors play important roles in early phase of disaster especially as Forward Medical Team as many treatment can be initiated at pre-hospital level. Knowledge and skills on psychological first aid is equally important and must be emphasized during treatment in aftermath of disasters. **Corresponding Author:** Azlan Helmy Ab Samat (azlanhelmy@ukm.edu.my)

**A Pilot Study to Evaluate the Potential of Using a CarbonCool Vest in Reduction of Heat Stress among First Responders Donned in COLD500 Decontamination Suit**
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**Background and Objectives:** Decontamination of Hazmat casualties requires donning of personal protective equipment (PPE) e.g. COLD500, to prevent cross-contamination. PPE are made from chemically-impermeable material, which inadvertently prevents heat loss by evaporative cooling of sweat. Prolonged PPE usage causes heat injury. Mitigation strategies include cooling vests with heat-absorbing gel or phase-change material. A recently-developed CarbonCool vest utilizes EMCOOLS FlexPads, based on HypoCarbon, a material comprising graphite and water, known for greater thermal conductivity than water and ice, capable of achieving cooling rates of 3.4°C/hour. This pilot study aims to evaluate the potential of CarbonCool vest in reduction of heat stress among first responders donned in COLD500 decontamination suit while carrying out moderate-intensity functional exercises. **Methods:** A convenience sample of 10 volunteer staff from the Emergency Department were recruited. Estimated core body temperature, body surface heat signature and heart rate were parameters measured as reflective effects of heat stress placed upon participants. 5 sets of moderate-intensity physical exercises were performed over a duration of 20 minutes, with intermittent short rest periods between each set of exercise. **Results:** There was a gradual increase of estimated core body temperature among trial participants without vest at T-5 min and T-20 min, 36.2 ± 0.3°C and 36.7 ± 0.4°C respectively. Trial participant with CarbonCool vest displayed a gradual reduction of estimated core body temperature at T-5 min and T-20 min, 36.0 ± 0.4°C and 35.9 ± 0.8°C respectively. The average captured estimated core body temperature among trial participants with vest was 36.5 ± 0.3°C and with the CarbonCool vest was 35.9 ± 0.6°C. **Conclusions:** These preliminary results exhibit gradual reduction and lower estimated core body temperature when trial participants are engaged in moderate physical activity whilst donned in the COLD500 Hazmat decontamination suit with CarbonCool vest. There are potential benefits in utilizing CarbonCool vest during Hazmat disaster requiring PPE, to reduce risk of heat injury among hospital staff first responders. **Corresponding Author:** Pravin Thiruchelvam (pravin_thiruchelvam@cgh.com.sg)

**Clinical Pharmacist Role: an Empowerment to Disaster Scene Management**
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**Background and Objectives:** Disaster causes chaotic environment and confusion among inter-agencies including the healthcare system. Role of clinical pharmacists in disaster setting may be useful as they may be able to prevent the drug administration error and facilitate the delivery of the drugs stock. **Methods:** We managed a mass casualty incident which occurred secondary to massive food poi-
soning secondary to an event which was conducted by district police officers during their gathering. It occurred on 1st February 2018 involving 65 casualties of Sandakan district police officers. A disaster alert was declared in our hospital and we deployed our medical team within 15 minutes post declaration to scene consisting of 2 Emergency Physicians, 6 Medical Officers, 1 clinical pharmacist, 3 Medical Assistances, 3 nurses and 8 Medical Assistance Diploma students. The triaging was based on the severity of the symptoms and patient’s clinical presentation. The registration of the patients were done by a medical assistant who keeps track of patient’s particulars. Our clinical pharmacist was placed in green zone area to cater for outpatient medical drugs dispensing. There were total of 39 patients treated at the field clinic and 4 of them were sent to the hospital for further assessment and hospitalization. We declared stand down alert at our field clinic approximately 6 hours later on the same day. Results: The placement of a clinical pharmacist at field during our mass casualty incident experience was extremely helpful. She helped us identifying the types of the medications that should be brought to the field hospital, assisted us to dilute the medications such as ORS at field hospital and took care of the floor stock of the medications at scene. Conclusions: Clinical pharmacist play a significant role in field clinic during disaster occurrence. We strongly recommend the incorporation of a clinical pharmacist in any form of disaster management and response.

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**What is the Interrater Agreement of Injury Classification When Using the World Health Organisation’s Minimum Data Set For Emergency Medical Teams?**

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Background and Objectives: In 2017 The World Health Organisation (WHO) finalised its first minimum data set (MDS) for use by emergency medical teams (EMTs) for use in disaster settings. The MDS is designed for daily reporting to facilitate disaster response co-ordination of healthcare teams. This study specifically tests the inter-rater agreement of the MDS injury classification. Methods: In April 2018, a survey containing 25 short case vignettes was sent to a select group of clinical staff registered with the UK EMT, NZMAT or AUSMAT. The 86 respondents are clinically engaged in managing injured patients and have undergone some training and/or deployment with an EMT with a view to practising in a disaster environment. Participants were asked to classify the cases according to the available options: major head spine injury; major torso injury; major extremity injury; moderate injury; minor injury; other. The primary outcome was to find the inter-rater agreement using the MDS injury categories. Secondary outcomes include: inter-rater agreement for specific injury description; and sub-group analysis of specialty/profession, different levels of clinical experience and actual disaster experience. Randolphs kappa statistic for free-marginal multi-rater data was used for analysis. Results: The kappa statistic was 0.59 [C.I. 0.49,0.69] for the whole data set, with some groups such as paramedics, doctors and those with disaster experience showing slightly higher levels of agreement, matched with increased lower limits of confidence intervals. Conclusions: The MDS injury classification shows overall inter-rater agreement approaching what would be widely considered a moderate level. The limitations of this study in its case descriptions, non-clinical environment and limited participant number must be considered. However we must also consider these results and interpret acute MDS injury reporting with caution when allocating resources during a sudden onset disaster whilst testing inter-rater agreement further.

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**Time Pattern of Presentation of Victims of High Speed Craft Marine Massive Casualty Incidents to the Emergency Department**

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Background and Objectives: The limited deck space of high speed craft (HSC) and the associated difficulty in extrication and transport of more seriously injured victims in rough sea conditions may lead to the dual wave phenomenon where the emergency department (ED) is overwhelmed by the initial wave of minor injuries, followed by the second wave of more seriously injured victims in mass casualty incidents (MCIs). We sought to evaluate the time pattern of ED presentation of victims of HSC MCI . Methods: We conducted a retrospective review of all HSC MCIs in Hong Kong and collated data from 7 EDs and the Marine Department from 2005 to 2015. We determined the time interval between the official time of the incidents and ED registration time for each victim and compared the mean time interval between those with serious trauma (ISS > 15) and those without. Results: We identified 8 HSC MCIs (Table 1) and included 473 victims (median age 43.0 years old, IQR 31-53 years old; male to female ratio 1:2.1), of whom 21 had an ISS > 15 and 11 were certified dead in the ED. The time pattern of ED presentation is shown in Figure 1. The mean time interval was significantly shorter for those victims with an ISS > 15 (162.4 min vs. 214.4 min, P = 0.012) compared with those with a lower ISS. However, most victims who presented within the first 90 minutes of the incidents had minor injuries. Conclusions: Although dual wave phenomenon was not apparent in HSC MCIs in Hong Kong, emergency physicians should not underestimate the severity of the situation based on the milder presentation of victims first arriving at the ED. Given the time lag between the incident and the arrival of victims, ED should have enough time to mobilize extra resource to cope with the anticipated surge in demand.

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**Emergency Medicine Training in Sub-Saharan Africa**

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Background and Objectives: Emergency Medicine (EM) is an emerging specialty worldwide. The first EM training programme in Sub-Saharan Africa (SSA) was founded in South Africa in 2004. Since then, further training programmes have been created both in South Africa and in the rest of SSA. The aim of this paper was to identify and characterise all EM training programmes in SSA. Methods: Information was sought via search engines and official training websites as well as by contacting EM trainees and others involved in EM training. All identified countries with EM training programmes were analysed for multiple factors including duration of training, number of training opportunities and the year the EM training programme was established. Results: EM training programmes were identified in Botswana, Ethiopia, Ghana, Kenya, South Africa, Tanzania and Uganda. These shared some similarities but also great variability. Required rotations were often similar. Variability included training duration (ranging from 18 months to four years), number of training opportunities (while most countries have only one, South Africa offers the most with four) and the year the training programme was established (the most recent being Uganda in 2016). Conclusions: EM training is currently only available in a select number of countries in SSA but more opportunities are continuously being created, making this an exciting time to be practising in SSA. Where training is offered, there is often significant variability in the training requirements. Different countries may choose to adopt training programmes that suit their individual needs and preferences. As more countries adopt emergency medicine as a specialty, there are clear benefits in exchanging lessons learned from other countries. This can be from other countries in SSA, such as at the biennial African Conference on Emergency Medicine or from further afield, such as at the International Conference on Emergency Medicine.

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**Mini-Emergency Clinical Performance Examination as a Complementary Assessment Method For Emergency Medicine Subinternship: a 3-Year Implementation Experience**

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Background and Objectives: Although mini-CEX is a well-known workplace-based assessment method for medical students or residents, it would be not feasible in a busy single-coverage emergency department (ED) and standardized assessment has been difficult in the ED. To overcome this limitation, we developed mini-
emergency clinical performance examination (EM-CPX) using standardized patients (SPs) as a complementary assessment method and have implemented into the emergency medicine (EM) subinternship. **Methods:** Two CPX scenarios (minor trauma and acute gastroenteritis) and assessment tools were developed and have been applied to the 4th year medical students participated in 4-week EM subinternship. Each CPX consisted of a 10-minute SP encounter, 5-minute ED record writing, and 10-minute feedback by the faculty and SPs. The content validity of the tools was validated by 4 emergency physicians and interrater reliability was evaluated through on-site assessment and video analysis by 2 emergency physicians. We evaluated the course achievement of the students using portfolio, self-assessment and changes in the mini-EM CPX scores at the pre-and post subinternship. **Results:** A total of 26 students participated in the subinternship for 3 years and 25 students completed the all assessment. The pre-and post-subinternship intra-class correlation coefficients were 0.824 and 0.937 for trauma case and 0.955 and 0.893 for the medical case, respectively. The self-assessed learning outcomes were significantly improved (p < 0.05 for each outcome, respectively), and the CPX scores were significantly improved after the subinternship in both scenarios (41.0 [IQR 36.5–44.0] vs. 52.0 [IQR 47.0–57.5], p < 0.001 for trauma case, and 56.0 [IQR 54.0–58.0] vs. 50.0 [IQR 47.5–52.5] p < 0.001 for medical case).

**Conclusions:** The mini-EM CPX using SPs would be a useful complementary assessment method for EM subinternship. It could be helpful for assessing the 4th year medical student’s core competency to manage the ED patients objectively in a safe environment.

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**Multi-patient Simulation with Standardized Patients in Undergraduate Medical Education**

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**Background and Objectives:** University of Calgary medical school simulations are traditionally run with one plastic mannikin for groups of 4-6 students. Cases are often emergency or resuscitation cases to highlight teamwork skills. Limitations of this simulation style include limits on patient realism, low patient-to-student ratio, and less emphasis on lower acuity cases. In July 2018, the first University of Calgary medical school multi-patient simulation, using standardized patients, was launched for second-years to provide an alternative approach to simulation training. **Methods:** Groups of 4-6 students participated in a 15-minute, 3-actor simulation, followed by a 15-minute debrief, in their “Intro to Clinical Practice” course. The scenario was a mass gathering event where students worked inside a medical tent. Patient A had anaphylaxis, Patient B sustained an ankle injury, while Patient C was dehydrated and anxious. Students practiced prioritization and teamwork skills. Students also practiced handover to each other and to EMS (one of the facilitators). Two facilitators observed and debriefed the simulation. **Results:** Post-course evaluations revealed that students enjoyed the multi-patient simulation, commenting on its ability to challenge and advance their skills, along with the benefit of improved student-to-student ratio. **Conclusions:** This educational strategy of a multi-patient simulation with actors can improve patient realism, increase individual hands-on time, and give educators the ability to insert multiple lower acuity cases within the same simulation. As well, students can learn from several cases rather than one. Finally, multi-patient simulations can help teach medical students concepts in disaster medicine and mass-gathering medicine, where ad-hoc teams must utilize teamwork and triaging skills.

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**The Use of Room Escape Games as an Alternative Teaching Strategy in Toxicology Education**

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**Background and Objectives:** Gamification is increasingly being used as an adjunct to traditional teaching strategies in medical education to increase motivation of learning and engagement. We had designed room escape games combining toxicology knowledge-based problems and clues theme. This study is to assess the impact of a toxicology-themed room escape games on satisfaction of participants in learning toxicology. **Methods:** Each student in the study received 3-hour essential toxicology teaching classes then participated in the games. They should use clues and knowledge learned from the classes to solve toxicology questions and escape from the rooms. The satisfaction and rating of this training session were collected by questionnaire at the end of the class. **Results:** Data from 22 of 42 enrolled participants (52% response rate) were available for analysis. Responses were generally very positive with an overall course rating score of 4.5 (SD ± 0.8) in 5 points scale questionnaire. As well, mostly the participants agree the effectiveness of gamification course of learning toxicology with rating score 4.5 (SD ± 0.6). The majority of participants recommend the activity to other learners, which rating 8.8 (SD ± 1.1) in 10 points scale. **Conclusions:** By combining knowledge-based problems with room escape method, via the game elements of competition, interaction, and storytelling, our feasibility study demonstrated that gamification is an effective pedagogical tool to teach toxicology. Room escape games offer a fun and engaging alternative that could be further utilized in toxicology education.

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**FS_EDU_01_05**

**Smartphone-Based Evaluations of Resident’s Performance Using the Taiwan Emergency Medicine Milestones Shift Card Tool**

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**Background and Objectives:** Taiwan Emergency Medicine (EM) Milestone Project has been implemented as part of the competency-based medical education program since 2014. However, literature regarding evaluation of performance of the project was lacking. Our study examines the usefulness of smartphone-based EM milestones shift cards in evaluation of emergency doctors’ proficiency level during their residency training. **Methods:** We developed a web-based electronic portfolio system consisting of learning resources, teaching records, curriculum standards, student feedback, mentor feedback, and different evaluation tools including the EM milestones shift cards. On every shift, instructors evaluated their residents’ competencies by ticking checklists and filling-up blanks in the EM milestones shift cards which can be accessed via their own smartphones. The results were collected over a 1-year interval, from July, 2017 to June, 2018. We analyzed the difference in subcompetency score between junior and senior residents using the Mann-Whitney U Test. **Results:** We found that 12 of the 20 subcompetencies in the EM milestone shift cards showed significant difference in scores between senior residents vs. junior residents. These 12 subcompetencies are: Patient Care (PC) 1 (Emergency Stabilization), PC2 (Performance of Focused History & Physical Exam), PC3 (Diagnostic Studies), PC4 (Diagnosis), PC5 (Pharmacotherapy), PC6 (Observation and Reassessment), PC7 (Disposition), PC8 (Task-switching), PC11 (Anesthesia and Acute Pain Management ), Professionalism1 (Professional Values), Interpersonal & Communication Skills (ICS1) (Patient Centered Communication), and ICS2 (Team Management). The results were discussed in our Clinical Competency Committee on a regular basis and comments were directed to the training. Feedback was given to the residents, instructors, mentors, program director, and the department chairman. **Conclusions:** Past literature revealed that many challenges were encountered when incorporating the EM milestones into resident assessment. Our study serves as a feasible and easily usable model for emergency departments to implement the EM milestone assessment tool using smartphones at the bedside during each work shift.

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**FS_EDU_01_07**

**Assessment and Training of Botswana Traffic Police Officers in Context Specific Basic Pre-Hospital Trauma Care**

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**Background and Objectives:** In Botswana, Traffic officers are often the first responders to Motor Vehicle Collision. The study sought to determine how officers provide pre-hospital care and determine if they retained skills and knowledge if trained in a context-specific trauma care course. **Methods:** A questionnaire-based cross-sectional survey was conducted on a sample Police Officers on past pre-hospital care training, attitudes towards providing pre-hospital care to victims, the number of RTC related deaths and injuries encountered in the last 6 months, their interventions to the victims and limitations encountered in providing care. A con-

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text-appropriate course was conducted and conducted for the officers and evaluated with a theoretical and practical pre-and post-test. **Results:** The officers attended to a median of 10 injured victims (IQR=5-20) and a median of 2 deaths (IQR=0-4) in the preceding 6 months. They generally accepted that they have a role and responsibility to provide pre-hospital care to RTC victims. Officers frequently secure accident scenes and transport injured victims to health facilities. They rarely intervene to stop haemorrhage, perform any airway manoeuvres or splint injured limbs. The major limitations to providing care were lack of first aid supplies and PPEs, lack of knowledge and skills and disruptive onlookers at accident scenes. A day context-appropriate course was developed, and officers were trained. There was a statistically significant improvement (p<0.05) in the pre-vs. post-test scores in both the theoretical and practical skills tests; 65% (SD±18.6%) vs. 92.8% (SD±10.5%) and 9.9 (SD±1.9) vs. 15.1 (SD±1.3) respectively. **Conclusions:** Traffic officers attend a substantial number of RTC related injuries and fatalities in Botswana. They have limitations to providing care and context-appropriate training of traffic officers in Botswana is promising as an additional strategy for pre-hospital care.

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**FS_NEU_01_02**

**Determing the Clinical Significance of Hearth Type Fatty Acid Binding Protein Levels in Ischemic Stroke and Stroke-like Syndromes**

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**Background and Objectives:** Stroke, the sudden death of brain cells due to lack of oxygen, caused by blockage of blood flow or rupture of an artery to the brain. The early prediction of long-term clinical outcome following ischemic stroke is important because of the high morbidity and mortality associated with stroke. There is no single biological marker for diagnosis of ischemic stroke or differentiate stroke-like syndromes. H-FABP is mainly found in the neuronal cell body and is no single biological marker for diagnosis of ischemic stroke or differentiate stroke-like syndromes. H-FABP is mainly found in the neuronal cell body and is mainly used as a valid diagnostic biomarker for stroke.

**Methods:** We reviewed 3,060 patients who referred to neurologist at a tertiary care emergency department (annual volume of 80811) over a 1-year period. We categorize the type of complaints and patients disposition. **Results:** Of the 3,060 patients analyzed in our study, the most common chief complaints were motor weakness (27.1%), mental change (14.7%), dizziness (14.5%), headache (8.8%), and seizure (7.1%). 1587 patients (51.9%) were admitted for further management. Among admitted patients, 1153 patients (72.7%) were belonged to neurologic department. The most common chief complaints for neurologic admission were motor weakness (41.2%), mental change (11.8%), headache (9.9%), seizure (8.3%), and language problem (7.9%). **Conclusions:** Patients with neurological emergency are common and diverse. It is important to know assessment process for chief complaint of neurological emergency. Emergency physician must be trained to common and urgent neurologic symptoms, such as motor weakness, mental change, dizziness, headache, seizure, and language problem.

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**FS_NEU_01_03**

**Drug Treatment of Primary Headache in an Australian Emergency Department**

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**Background and Objectives:** Choosing Wisely Australia (http://www.choosingwisely.org.au/recommendations/anza) questions the use of opioids for the treatment of migraine, while the American Headache Society recommends intravenous metoclopramide and prochlorperazine, and subcutaneous sumatriptan (Headache. 2016;56:911–40). The objective of this study was to describe contemporary drug therapy for primary headache diagnoses in an Australian emergency department (ED). **Methods:** A retrospective, chart review was conducted in an adult metropolitan tertiary-referral hospital. Patients (≥ 18 year) with a migraine, tension-type, cluster and non-specific benign headache diagnoses (ICD-10-AM codes: G43.9, G44.2, G44.5, R51) were included from 1-7-2016 to 30-6-2017. Head trauma and other neurosurgical cases were excluded. Clinical data were abstracted from electronic medical records including digital scans of medication charts. **Results:** There were 1,039 patients. The 20-39 and 40-59 year ages group constituted 56% and 29% of patients respectively and women comprised 66%. Ambulance and walk-in patients represented 35% and 65% of the sample respectively. General Practitioners referred 6% of patients. Opioids (both oral and parenteral) as first-line treatment were prescribed in 36.3% (95% CI: 33.4-39.3%) of cases (codeine 13.3%, oxycodone 17.6%, fentanyl 3.2%, morphine 2.0%). Chlorpromazine infusion (12.5 mg in 78%, 25 mg in 18%) was administered in 18%. Triptans were not prescribed in any patient. Anti-emetics were given in half of the cases (ondansetron 24.1%, metoclopramide 22.6%, prochlorperazine 4.6%, droperidol 1.3%). Patients were admitted to the ED short stay unit and in-patient ward in 28% and 7% respectively. **Conclusions:** Opioids continue to be prescribed as a first-line treatment in a considerable proportion of primary headache patients in the ED despite recommendations to the contrary. Triptan was under-utilized. Opportunities exist to optimize the drug therapy for one of the common presentations to the ED.

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**Intravenous Thrombolysis with Recombinant Tissue Plasminogen Activator Followed by Endovascular Thrombectomy in an Acute Ischemic Stroke Patient After Dabigatran Reversal with Idarucizumab**

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**Background and Objectives:** Patients under dabigatran therapy presenting with acute ischemic stroke are contraindicated for intravenous thrombolysis with recombinant tissue plasminogen activator (r-tPA) due to the increased risk of hemorrhagic transformation. Nonetheless, idarucizumab-a specific reversal agent for dabigatran-had been reported to provide better outcomes for these patients receiving intravenous thrombolysis. However, the efficacy and safety of idarucizumab in patients planned for endovascular thrombectomy have not been validated. **Methods:** We report a case of successful intravenous thrombolysis with r-tPA followed by endovascular thrombectomy after administration of idarucizumab for anticoagulation effect reversal in an acute ischemic stroke patient under dabigatran therapy. **Results:** A 71-year-old man taking dabigatran 110 mg bid was admitted with National Institutes of Health Stroke Scale (NIHSS): 9 and an left M1/M2 branches of middle cerebral artery occlusion on head computed tomography angiography. We administered 5 g of idarucizumab intravenously and then performed intravenous thrombolysis with r-tPA and endovascular thrombectomy afterwards. The patient was discharged on day 25 with NIHSS: 2 and Modified Rankin Scale: 1.

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3 and Barthel index: 65. **Conclusions:** Our case report supports the evidence that patients presenting with an acute ischemic stroke despite taking dabigatran should be evaluated for reversal by idarucizumab which can contribute to the eligibility for intravenous thrombolysis as well as endovascular thrombectomy and provide more favorable neurological outcomes. The availabilities of specific reversal agents for non-vitamin K antagonist oral anticoagulants will probably alter current managements of acute ischemic stroke.

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**FS_NEU_01_05**

Effectiveness of Combined External Ventricular Drainage with Intraventricular Fibrinolysis For Treatment of Intraventricular Haemorrhage with Acute Obstructive Hydrocephalus

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**Background and Objectives:** Intraventricular haemorrhage (IVH) patients with acute obstructive hydrocephalus (AOH) who require external ventricular drainage (EVD) have a high risk of poor outcomes. Intraventricular fibrinolysis (IVF) with low-dose recombinant tissue plasminogen activator (rt-PA) can be used to improve patient outcomes. Here, we evaluated the impact of IVF on the risk of death and functional outcomes in IVH patients with AOH. **Methods:** This prospective cohort study included IVH patients with hypertensive intracranial haemorrhage complicated by AOH that required insertion of EVD. We evaluated the risk of death and the functional outcomes at one and three months, with a specific focus on the impact of combined EVD with IVF by low-dose rt-PA (1 mg every 8 hours, maximum 9 mg) (EVD+IVF) group. **Results:** Between 2011 and 2014, eighty patients were included. Forty-five patients were treated with EVD alone (EVD group) and thirty-five received IVF (EVD+IVF group). The 30- and 90-day mortality rates were lower in the EVD+IVF group than in the EVD group (42.2% vs. 11.4%, p=0.003 and 62.2% vs. 20%, p<0.001; respectively). The Glasgow scores were significantly lower in the EVD+IVF group than in the EVD group (p ≤ 0.001) during the first 3 days and at day 7 after assignment. The 30-day good functional outcome (mRS, 0 to 3) was also higher in the EVD+IVF group (6.7% vs. 26.6%; p=0.008). However, the 90-day good functional outcome (mRS, 0 to 3) did not significantly increase in the EVD+IVF group (30.8% in the EVD vs. 51.6% in the EVD+IVF group; p=0.112). **Conclusions:** In our prospective observational study, EVD+IVF was associated with lower mortality of severe IVH patients than was EVD alone. EVD+IVF removed ventricular clots faster at the end of treatment and improved the chance of having a good functional outcome at one month; however, this result was no longer observed at three months.

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**FS_NEU_01_06**

Frothing in the Lungs-Expect the Unexpected-Neurogenic Pulmonary Edema

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**Background and Objectives:** An unexplained sudden deterioration of respiratory function owing to increased pulmonary interstitial and alveolar fluid in the absence of any obvious and definite cause of acute respiratory failure is attributed to Neurogenic Pulmonary Edema. It may be a complication in 8% to 23% of all patients with subarachnoid hemorrhage and approximately 71% of fatal cases. Many episodes are not well tolerated and resolve within 48 to 72 hours because the outcome of patients with neurogenic pulmonary edema is usually determined by the course of neurologic insult. **Methods:** We present here two case scenarios of Pulmonary Edema which had an underlying CNS pathology. Firstly, we had a 39 years old female who developed sudden onset headaches, vomiting followed by progressive dysorexia and then brought to ER in a comatose state. She had a history of left parieto-occipital AVM; cerebral bleed 15 years back. On intubation copious pink frothy sputum was aspirated. Her CT revealed a large Intraventricular bleed.

**Results:** Secondly, we had a 27 year old male presenting with history of fever and cough for the last 4 days and headache for 7 days associated with multiple episodes of vomiting. He presented to the ER with breathlessness. On arrival he was desaturating to 70% with bilateral profuse crepitant. He required noradrenaline to maintain MAP/USG and 2D ECHO were normal. Total Leucocyte Count was 44000. Chest X-ray was suggestive of Pulmonary edema. CT revealed Large aneurysm of right MCA suggestive of dissecting mycotic aneurysm. Stent assisted coil was done and patient improved and was discharged. **Conclusions:** Our cases suggest Neurogenic Pulmonary Edema could be kept in mind while evaluating a case of pulmonary edema. Hence, arrangements for prompt tackling of the situation is needed as immediate assessment and treatment of the underlying CNS pathology has good outcome and prognosis.

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**FS_NEU_01_07**

Neuroimaging Utilisation in Acute Non-Traumatic Headache Patients in Emergency Department: Significance of ‘SNOOP4’ as Red Flag Signs

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**Background and Objectives:** Non-traumatic headache (NTH) accounts up to 4.5 percent of all patients presenting to Emergency Department (ED). NTH are generally classified into 2 categories: Primary and secondary headache disorders. Differentiating secondary from primary headache disorders is very essential. SNOOP4, which stands for systemic and secondary symptoms, neurological signs and symptoms, sudden onset, onset after age 50, progressive headache, precipitated by valsalva, postural aggravation, and papilledema, is known as a mnemonic for suggesting clinicians to send neuroimaging to ruled out serious conditions. Yet, benefit of using this mnemonic in ED is not well established. This study aimed to assess the significance of SNOOP4 in detecting serious causes of NTH in adults presenting to ED. **Methods:** We conducted a prospective study of adult patients presenting to the ED of single tertiary hospital over a period of 12 months. Patients with acute NTH (equal or less than 7 days) presented at ED were included. A standard record form was used to record details of the history and physical examination findings. Patients were investigated and treated following to the existing protocols. Results were interpreted by attending radiologists. Each factor according to SNOOP4 was then evaluated for the ability to predict serious causes of NTH. **Results:** Ninety patients were included in this study with complete details obtained on 83 (92.2%) patients. 63 (73.0%) were female. Mean age was 44.5 years (IQR 27.58). Duration of headache ranged from 10 minutes to 7 days. 27 out of 83 (32.5%) had at least 1 SNOOP4 criterion. 25 (30.1%) patients had more than 1 SNOOP4 criterion. The variables closely associated with prognosis of ischemic stroke in the Chinese Population

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**Background and Objectives:** Efficient assessment of patients after ischemic stroke has important reference value for doctors to choose appropriate treatment for patients. Our study aimed to develop a new prognostic model for predicting outcomes three months after ischemic stroke among Chinese Population. **Methods:** A prospective observational cohort study among ischemic stroke patients presenting to Emergency Department in the Second Affiliated Hospital of Guangzhou Medical University was conducted from May 2012 to June 2013. Demographic data of ischemic stroke patients, assessment of NIHSS and laboratory results were collected. Based on three-month modified Rankin Scale (mRS) ischemic stroke patients were divided into either favorable outcome (mRS: 0-2) or unfavorable outcome groups (mRS: 3-6). The variables closely associated with prognosis of ischemic stroke were then entered into a stepwise logistic regression model. 51.6% in the EVD+IVF group; p=0.112).

**Conclusions:** Our prospective observational cohort study among ischemic stroke patients presenting to ED was used to establish an efficient risk model for predicting outcomes. The sensitivity, specificity, PPV, and NPV of SNOOP4 were 77.8%, 73.0%, 25.9%, and 96.8% respectively. SNOOP4 criteria shows very high NPV for excluding serious causes of acute NTH in adult patients presenting to the ED.

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**FS_NEU_01_08**

Derivation of a Prediction Rule For Unfavourable Outcome After Ischemic Stroke in the Chinese Population

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Favorable Neurological Effects of Early Endotracheal Intubation Insertion on Out-of-hospital Cardiac Arrest

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Background and Objectives: Emergency life-saving technicians (ELST) can select endotracheal intubation (ETI) in out-of-hospital cardiac arrests (OHCA) in Japan. However, the effects of ETI for OHCA has not been determined and the influence of timing of ETI remains unclear. The aim of this study was to analyze the association between ETI timing and the survival with a good cerebral function on OHCA.

Methods: We extracted patients who were performed ETI on the scene from nationwide OHCA database registered between 2014 and 2015. Total of 4789 patients with 15 to 84 years old and recorded ETI time were analyzed. Patients were divided into 3 groups using tertile of ETI time (Q1, n=1,385, 1 to 8 min; Q2, n=1,592, 9 to 13 min; Q3, n=1,387, 14 to 29 min). A multivariable logistic regression was applied to estimating of odds ratio for the return of spontaneous circulation (ROSC) rate and the good cerebral function (CPC1-2) rate. Results: The Q1 group had the highest rate of ROSC (22.5%) and CPC 1-2 (3.4%) as well as favorable neurological outcome (aOR 0.84; 95% CI: 0.75-0.93). Subgroup analysis showed the longer ALS response time was negatively associated with the chances of survival to discharge among OHCA patients with shockable rhythm receiving bystander CPR (aOR 0.84; 95% CI: 0.75-0.93) and shockable rhythm with bystander witnessed (aOR 0.85; 95% CI: 0.81-0.97).

Conclusions: The modified prognostic model, NAAP may be a better prognostic tool for predicting 3-month unfavorable outcomes for ischemic stroke than NIHSS alone.

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The Influence of Advanced Life Support Response Time on Patient Outcomes After Out-of-hospital Cardiac Arrest in Taipei

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Background and Objectives: Response time has been well recognized as a prognostic factor for patients with out-of-hospital cardiac arrest (OHCA). However, the relationship between OHCA patient survival and advanced life support (ALS) response time remained unclear. We tested the hypothesis that for adult, non-trauma OHCA patient, longer ALS response time was associated with a worse chance of survival.

Methods: We analyzed 5 years of Taipei Utstein-based registry data from non-trauma adult OHCA patients whose resuscitation had been participated by ALS. The exposure was ALS response time. EMT-witnessed arrest and ALS response time >15 mins were excluded. The primary outcome was survival to discharge, and the secondary outcome is the favorable neurological outcome (cerebral performance category 1 and 2). Subgroup analyses were based on Utstein template. Results: From 2011 to 2015, a total of 4,288 cases were analyzed. The median response time of ALS was 9 minutes (interquartile range 7 to 12). Every minute delay of any ALS response time would reduce 6% chance of survival to discharge (adjusted odds ratio [aOR] 0.94; 95% confidence interval [CI]: 0.90-0.98) as well as favorable neurological outcome (aOR 0.90; 95% CI: 0.85-0.96). Subgroup analysis showed the longer ALS response time was negatively associated with the chances of survival to discharge among OHCA patients with shockable rhythm receiving bystander CPR (aOR 0.84; 95% CI: 0.75-0.93) and shockable rhythm with bystander witnessed (aOR 0.85; 95% CI: 0.81-0.97).

Conclusions: In non-trauma adult OHCA in Taipei, the longer ALS response time was associated with the worse odds of survival to discharge and favorable neurological outcome, especially in patients with presenting shockable rhythm.

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EMS Call Centre Over-triage and the Reasons behind them in a Cape Town, South Africa Setting

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Background and Objectives: Inappropriate dispatch of urgent ambulances by call centre personnel causes an unnecessary drain on resources. How often urgent dispatches are inappropriate has not been evaluated in any lower-middle-income countries, nor have factors been assessed that contribute to these decisions. The study aims to establish rates of pre-hospital over-triage in and to assess the call centre factors around these decision-making processes.

Methods: This was a retrospective study of urgent (“lights and sirens”) ambulance dispatches made from a large public sector ambulance call centre in Cape Town. Prioritization of calls for dispatch were correlated with on-scene, ambulance crew triage prioritization, using the South African Triage Score to determine which patients were ‘over-triaged’ by the call-taker. Contributory factors were also analysed and included time of day, nature of presenting complaint; and call-taker training and experience-all of which may have affected rates of over-triage.

Results: In the course of one month in 2017, 4,169 urgent calls were assessed: of these 2,701 were over-triaged (58.48%). Over-triage was similar between day (58.02%) and night (59.11%). The most regularly over-triaged complaint was obstetric & gynaecological (84.87%) followed by motor vehicle accidents (65.70%); the lowest rate was for cardiac call-outs (47.12%). We reviewed the 38 highest workload call-takers, and
found subtle, but non-statistically significant, trends towards higher over-triage rates with higher levels of training, more years as a call-taker and more years working in the field. Conclusions: Rates of pre-hospital over-triage in Cape Town are marginally lower than those described internationally. The nature of the complaint had a strong impact on these rates, notably trauma and gynaecological issues. More experienced call-takers may tend to over-triage more frequently, however the small sample size made these findings uncertain. These findings do however suggest the potential for improvement for better efficiency without compromising patient safety.

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Patient Demographics and Call Out Patterns of Patients Using Ambulance Services and Performance of Ambulance Services in Brunei Muara District

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Background and Objectives: The purpose of this audit is to elaborate the demographic of ambulance user, category of emergency calls that requires ambulance services, and to assess the performance of ambulance services in Brunei Muara district. Methods: This was a retrospective audit study where the data was collected from January-March 2016. Primary data were collected from ambulance vehicle response sheet from Emergency Medical Ambulance Services (EMAS). Secondary data were extracted from Brunei Darussalam’s Health Information Management System (Brn-HIMS). Statistic was carried out using Excel software. Results: Of the total 1,334 emergency calls, 77% were medical related problems, followed by trauma cases in 21%, and only 2% related to obstetrics and gynaecology issues. Most of patients (52%) were brought in to emergency department were females. Majority of patients (69%) were from the age group between 13-64 years old, and only (12%) from the pediatric group (age 12 years old and below). In term of call load per shift between morning shift, afternoon shift, and night shift were 38% vs. 40% vs. 22% respectively. Twenty five percent of total ambulance calls were in category C (Not serious or less urgent cases) and only 2% categorized as R-1 (cardio-respiratory arrest cases). The performance of ambulance services were reflected by mean ambulance dispatch time (5.08±2.47 minutes) and mean ambulance response time (18.26±8.33 minutes). Conclusions: Majority of ambulance call out pattern dominated by medical related problems, involving productive age group and mostly female. Mean ambulance response time was 18±8.33 minutes with 25% of the total emergency calls were categorized as less urgent cases. Further study and audit for current practice of ambulance services is needed to formulate the best system for local setting.

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Clinical Evaluation of Carboncool Half-Body Vest on HAZMAT Decontamination Crews Wearing Personal Protective Equipment

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Background and Objectives: Personal protective equipment (PPE) are essential protective gear for first responders such as fire fighters, military responders and healthcare workers, offering necessary protection from numerous hazards. Designed to be impermeable, PPE use causes increased physiological strain and reduced thermoregulation, limiting work times, causing heat-related illnesses or even heat stroke. Use of PPE have shown to reduce physiological outcomes are needed to assess the effect of the cooling vest on a subject’s endurance to heat stress.

Results: This clinical evaluation showed that the CarbonCool cooling vest is safe and tolerable in participants wearing PPE. Further trials with sample size powered to detect physiological outcomes are needed to assess the effect of the cooling vest on a subject’s endurance to heat stress.

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A Doubled National Utstein Survival For Out-of-Hospital Cardiac Arrest Over 2011-2015 Was Associated with a Series of Prehospital Initiatives in Singapore-a 5-year Journey in Prehospital Emergency Care

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Background and Objectives: Outcomes of patients from out-of-hospital cardiac ar-
Evaluation of the Usefulness of Serum Ammonia and Clinical Scoring Systems in the Early Prediction of In-hospital Mortality in Patients with Glufosinate Poisoning

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Background and Objectives: The mortality associated with human glufosinate poisoning is high, at 6.1%-17.7%. Early high mortality risk prediction can guide physicians in the application of intensive treatment in the emergency department (ED). This study aimed to evaluate the usefulness of serum ammonia, and Sequential Organ Failure Assessment (SOFA) and Acute Physiology and Chronic Health Evaluation II (APACHE II) scores in the early prediction of in-hospital mortality in ED patients with glufosinate ammonia poisoning. Methods: A prospectively collected pesticide poisoning registry at a single academic medical center was retrospectively analyzed between May 2007 and February 2018. The initial serum ammonia level was defined as the highest serum ammonia level measured within 24 hours after ED arrival. The SOFA and APACHE II scores were calculated using data obtained within the first 24 hours after ED arrival. The patients were divided into survivor and non-survivor groups by in-hospital death status. Results: In total, 110 patients were included. Ten patients (9.1%) died in the hospital despite treatment. The median initial serum ammonia level was significantly higher in the non-survivor group than the survivor group (219 µg/dL vs. 100.5 µg/dL, p < 0.001). The SOFA scores in the survivor and non-survivor groups were 2 (0–10) and 5 (1–8), respectively (p = 0.044). The APACHE II scores in the survivor and non-survivor groups were 7 (0–28) and 16 (8–22), respectively (p = 0.001). In the multiple logistic regression analysis, adjusted for age, sex and seizures, the initial serum ammonia level was the only independent predictor. The area under the curve of the initial serum ammonia level (0.967) was significantly higher than that of the SOFA and APACHE II scores (0.900) (p = 0.046 and 0.032, respectively). Conclusions: Serum ammonia levels measured in the ED may be adjunctive markers in the prediction of in-hospital mortality in glufosinate poisoning.

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Can New Regimens Reduce Adverse Effects of NAC in Paracetamol Overdose?

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Background and Objectives: N-acetylcysteine (NAC) is effective in the treatment of paracetamol toxicity. Traditionally, intravenous NAC is administered over 21 hours in three separate bags of weight-based doses over one, four and 16 hours. However, their efficacy in treating the overdose is same as the conventional therapy. The current measures. Conclusions: Shorter, modified treatment regimens with acetylcysteine for paracetamol overdose reduce the occurrence of adverse reactions. However, their efficacy in treating the overdose is same as the conventional therapy. RCTs with large sample size are needed for more valid and generalizable findings. Comparison of different short therapies can also help in indicating the best alternative treatment to standard.

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Comparison of Clinical Characteristics in Cathinone Abused vs. Other Substance Abused Patients in the Emergency Department

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Background and Objectives: Synthetic cathinones had emerged as a main category of the new psychoactive substances during the past years. The prevalence of chemicals producing local as well as systemic effects applied topically or ingest orally were analyzed. Statistical analysis was performed using IBM SPSS version 22.0. Results: Amongst 303 patients, 76.56% were female and 23.44% were male. Mean age and range of presentation was 23.8 ± 7.8 (15–60) years, mean volume consumed 75.2 ± 38.4 (25–250) mL, and mean time to hospitalization was 8.9 ± 10.9 (1–72) hours. Significant differences in the clinical profiles, laboratory markers between patients who consumed fewer volumes and those who consumed larger volumes. Explored efficacy of methylprednisolone vs. hydrocortisone. Classical features of poisoning such as cervicofacial edema, dark-colored urine, and hepatitis appear early as in six hours, full-blown picture of poisoning occurs between 6 and 12 hours. Length of ICU stay was significantly more in patients who consumed more volume (6.19 ± 4.19 days vs. 2.42 ± 0.96 days, p < 0.0001). Conclusions: Emerging health problem with mortality when consumed in larger dose. Could be alarming to Asian countries, hair dye is an emerging alternative to pesticide poisoning because of its easy availability, low cost. Toxicity is dose dependent with increased morbidity and mortality. Recommend introducing 25 mL sachets in place of the currently available 50 mL and 100 mL.

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Hair Dye Poisoning, Decade Experience in a Territory Medical College Hospital

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Background and Objectives: Ingestion of, an emulsion-based hair dye, is in trend as a major source of suicidal poisoning following pesticides because of its easy availability and low cost. Contains paraphenylenediamine and a mixture of other
Background and Objectives: Paralytic Shellfish Poisoning (PSP) is a foodborne illness that typically develops after consumption of shellfish contaminated with saxitoxin. Within hours of eating shellfish contaminated with toxic levels of saxitoxin, victims develop gastrointestinal distress and neurological symptoms, ranging from circulatory perturbations and tingling of the extremities to ataxia, dysphagia, changes in mental status and respiratory muscle paralysis. Methods: We received 7 patients having food poisoning symptoms after having lunch together on the ship. The symptoms started after 2 to 3 hours post meal. The symptoms included adult trauma patients intubated in the pre-hospital phase or within 30 minutes of arrival in the trauma bay at two level-1 trauma centres during a two-year period. In-hospital mortality was compared for patients intubated with ketamine vs. other hypnotics. Methods: In this retrospective study we included adult trauma patients intubated in the pre-hospital phase or within 30 minutes of arrival in the trauma bay at two level-1 trauma centres during a two-year period. In-hospital mortality was compared for patients intubated with ketamine vs. other hypnotics using logistic regression with adjustment for age, gender, Injury Severity Score (ISS), shock, and prehospital Glasgow Coma Scale score (GCS). Results: A total of 343 trauma patients were included with a median ISS of 25 (17-34). The most frequently used induction agents were ketamine (36%) and propofol (36%) followed by etomidate (9%) and midazolam (5%). In 15% of cases it was explicitly stated that the patient was intubated without administration of a hypnotic and in 32 cases no information was available on the use of drugs to facilitate intubation. There was no difference in ISS or the presence of shock according to the use of ketamine vs. other agents (propofol, midazolam or etomidate), but the pre-hospital GCS was higher for patients intubated with ketamine (median 8 vs. 5, p = 0.001). The in-hospital mortality for patients intubated with ketamine was 18% vs. 26.5% for patients intubated with other agents (p = 0.14). This remained statistically insignificant in the logistic regression analysis (Odds ratio 0.67 [0.33-1.38], p = 0.28). Conclusions: In this study, we found no statistically significant difference in mortality amongst patients intubated in the initial phase post trauma with the use of ketamine compared with other sedative agents (propofol, etomidate and midazolam). Larger, prospective studies are warranted to investigate this further.

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participating sites across ANZ. We looked at the mortality rates and demographics of patients presenting to trauma centres who receive massive, super-massive and ultra-massive transfusion within 12 hours of presentation. **Methods:** The determination for critical bleeding was done using ICD-10 criteria and a coding algorithm. For patients with a multiple possible bleeding categories a hierarchy was developed to assign the most relevant category. In this classification system patients admitted with trauma diagnoses were classified as trauma cases regardless of any other diagnosis or procedures recorded. We decided to look at patients presenting to trauma centres, admitted under a trauma service whom received MT within 12 hours of presentation. **Results:** After inclusion criteria were applied there were 936 patients whom received massive transfusion within 12 hours of presentation and were admitted to a trauma centre. 77.8% were male and 22.2% were female. The average age of patients was 46.4 years and the average age of those who died was 50.4 years. The overall mortality rate was 27%, between ages of 61-70, mortality rates were 30.4%, 38% in those 71-80 and up to 50% in those >81. Sub group analysis looking at the relationship between total number of blood products transfused and mortality showed an increased mortality in those patients who received >50 blood products. **Conclusions:** Our results demonstrate that trauma predominantly affects the younger male. We found that older trauma patients whom receive MT have higher mortality rates, up to 50%. This knowledge of clinical outcomes amongst these differing groups may be used to guide clinicians in the management of these patients.

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**The Effect of Cervical Collars on Intracranial Pressure in Trauma Patients: an Updated Systematic Review**

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**Background and Objectives:** Applying cervical collar for neck immobilization for patients with potential head and cervical spine injury is the standard care worldwide for decades. There is an increasing body of evidence to support the adverse effects of using the cervical collar in neck immobilization. One of the most important concerns is that cervical collars may increase the intracranial pressure (ICP) which has detrimental effects on patients with traumatic brain injury (TBI). The objective of this review was to study the effect of a cervical collar on intracranial pressure documented in the literature. **Methods:** Medline, Embase, Cochrane Library, Google Scholar, BestBETS, NICE, SIGN guidelines, ACP journal club, and ACEP clinical policies, along with the bibliographies of the relevant articles were searched up to July 2018. Two reviewers independently assessed the eligible studies using the Cochrane Collaboration tool for assessing the risk of bias and reported the risk of bias and abstracted data using predefined data fields. **Results:** From 48 potentially relevant studies, 5 papers were included in this review (total patients = 79); 4 of them were prospective observational short series, and one was a case report. Although all studies measured ICP in the ED on adult patients with trauma (inclusion criteria), there was a significant difference in the time between the first measurements (after collar application) and the second measurement (after the removal of cervical collar). In the included studies, except for the study by Kuhnigk et al., all others reported a significant rise in the ICP after application of a rigid collar. The mean rise in the ICP was 1.64 mmHg. **Conclusions:** The studies included in this review were of limited quality and design. They do suggest minimal rise in ICP after cervical collar application; however, clinical significance of such change is not well established. (Very low-quality evidence).

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**Does Location of CT Scan Affect Mortality of Trauma Patients?**

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**Background and Objectives:** We aimed to study the factors affecting mortality of trauma patients including locations of CT scan machine in a University Medical Center of a developing emergency care system. **Methods:** This is a retrospective analysis during two consecutive years (2014 and 2015) from a University Medical Center. All adult patients (18 years and older) who received WBCT from August to November (highest trauma acuity in our setting) were included into the study. CT scan machine was located in the Radiology Department at 2014 and in the Emergency Department (ED) at 2015. Data were extracted from the hospital information system. Non-parametric statistical methods were used to compare the patients who died and survived. Backward logistic regression model was used to define factors significantly affecting mortality. **Results:** During 2014, 200 patients out of 827 (24.1%) received WBCT. During 2015, 263 patients out of 951 (27.6%) received WBCT. 416 patients were studied for outcome: 260 (67.3%) patients were males. The mean (SD) age of the patients was 43.9 (18.9) years. The mortality was 3.4% (14 out of 416). Backward logistic regression model defining factors affecting mortality was significant (Nagelkerke R2: 0.672, p<0.0001). Significant factors were ISS (p<0.0001), GCS (p=0.001). CT location showed a very strong trend for affecting mortality (p=0.054) favoring the ED location. **Conclusions:** Patients received more WBCT scan when the CT scan was located inside the ED. ISS and GCS were the main factors predicting mortality in patients who received WBCT. It is advised that CT scan machine should be located within the ED.

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**The Effect of Different Types of Helmet on Brain Injury**

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**Background and Objectives:** Effectiveness of helmets in reducing head injury in motorcyclist is well established. There is limited data regarding to which helmet types protect riders from brain injuries. The effect of helmet type on risk traumatic brain injuries during motorcycle crashes. **Methods:** In this case-control study, medical records of motorcyclists were reviewed for patient demographics, helmet types, fastest helmets, ISS, incidence of traumatic brain injuries and facial bone fracture. The outcome of interest was incidence of traumatic brain injuries between full-face helmets and other helmet types. **Results:** There were 463 patients in this study, 70 patients reported traumatic brain injury (case group) and 393 patients without traumatic brain injury (control group). Compared with motorcyclists wearing full-face helmets and other helmet types, those wearing full-face helmets were less likely to have brain injuries (OR 0.41; 95% CI 0.21-0.79). Compared helmet fasten status, fastest helmets decreased risk of brain injury (OR 0.32; 95% CI 0.17-0.62). Helmet dislodged during collision increased risk of brain injury (OR 4.19; 95% CI 2.18-8.04). **Conclusions:** Full-face helmet more likely to protect brain injuries during crash. Moreover, fastest helmet and helmet fixation while collision provided potential protection against brain injuries.

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**A New Trauma Paradigm**

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**Background and Objectives:** The demographics of Singapore, as in many industrialised nations, is changing. The population is getting older and suffering increasing co-morbidities. With this shift in our medical paradigm, needs to come a shift in our perceptions. This audit aims to highlight that our trauma triage systems need to adapt to the changes in our patient demographics. **Methods:** A retrospective audit of Major Trauma cases (Injury Severity Score >15) for 2017 was undertaken in April 2018, for patients presenting to a Major Trauma Centre in Singapore. Data from the trauma registry was reviewed and cases of elderly patients with falls were reviewed. **Results:** A total of 333 patients presented with Major trauma (ISS >15) in our institution. 193 patients had suffered falls, on this group 152 had suffered “same level” falls, ie the had fallen from a standing height. Out of the patients with falls, 68 were elderly (greater than 78 years old). 22 out of 68 patients met our trauma criteria, meaning 65% of our elderly patients with major trauma did not meet our trauma activation criteria. **Conclusions:** Our perceptions of major trauma need to change, the vast majority of our elderly patients that suffered major trauma were not picked up by our trauma activation criteria (we use standard criteria). Furthermore, the elderly population is particularly vulnerable to falling and more likely to suffer a significant injury as a consequence. Trauma triage systems should be adapted to cater for the elderly population. Our hospital has reviewed the triaging systems and adopted a lower threshold for trauma team activation for the elderly population.

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The Collaborative European Neurotrauma Effectiveness Research in Traumatic Brain Injury (CENTER TBI) Registry—the Epidemiology of TBI Presenting to 55 European Hospitals

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Background and Objectives: TBI is an important European public health currently lacking robust epidemiological information. The CENTER TBI study, aims to describe standardised TBI epidemiological parameters. Methods: Prospectively recorded demographic, physiological, injury, and outcome data were collated from the clinical records of TBI patients presenting to 55 participating centres across 18 European countries from 2015 to 2017. Patients were stratified into; the “ICU stratum” where TBI patients were evaluated and discharged from the ED post-computed Tomography (CT), the “admission (ADM) stratum” where patients were admitted to hospital post CT but not to intensive care and the “ICU stratum” where TBI patients were admitted directly from ED or other hospital to the Intensive Care Unit. Results: 18,879 TBI patients were enrolled in the registry. 48% (9,087) in the ER, 34% (6,490) in the ADM, and 17% (3,302) in the ICU stratum. The median age was 55 years (IQR 32-76) overall however, patients in the ADM strata were older (64 years [IQR: 40-81]). Patients were predominantly male (60.4% [95% CI 59.7-61.1]) overall and within each stratum. Low level falls were the commonest injury mechanism overall (38.5% [95% CI 37.8-39.2]) however, Road Traffic Collisions were commonest in the ICU stratum (36.0% [95% CI 34.4-37.7]). Patients presented with a median GCS of 15 (IQR14-15), ICU stratum patients presented with lower conscious levels (median GCS12 [IQR12-15]), 71.4% (95% CI 70.8-72.1) of all registry patient CT scans were normal except in the ICU stratum where 80.7% (95% CI 79.4-82.1) were abnormal. Survival to hospital discharge was 95.4% (95% CI 95.1-95.7) overall. Conclusions: TBI presents to European hospitals as two-diseases-low energy TBI resulting from ground level falls in conscious older patients predominates in admitted patients-high energy TBI usually occurs in younger males where impaired consciousness signals TBI requiring critical care.

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Assessment of See and Treat Clinic in the Emergency Department at Mafraq Hospital: Performance and Quality of Care Provided

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Background and Objectives: Overcrowding in emergency departments (EDs) is a global issue. See and treat (ST) clinics is implemented to evaluate and treat patients with minor complaints to achieve immediate care and patient’s satisfaction. Objective: To evaluate the performance and quality of care provided at the ST clinic in the ED at Mafraq Hospital in Abu Dhabi, U.A.E. Methods: It’s a retrospective electronic data-based analyses study. All T4 and T5 patients treated at ST clinic and other ED areas including the off-site Urgent Care Unit (UCC) between June 2016-June 2017, were included. The primary outcomes were Door to Doctor time, Door to Door time, return within 72 hours, analysis of return within 72 hours, and feedback patients treated at the clinic. The Secondary outcomes were Door to Door time, Door to Doctor time, analysis of return within 72 hours, and feedback patients treated at other ED areas and UCC. Results: 43,109 patients were enrolled. Primary outcome: The Door to Doctor time was within 30 minutes for 89% of ST clinic patients, and the Door to Door time was within 2 hours for 94% of patients. 2% of patients returned within 72 hours. Secondary outcome: The Door to Doctor time was within 30 minutes for 92% of UCC patients, and the Door to Door time was within 2 hours for 80% of patients. 4% of patients returned within 72 hours; The Door to Doctor time was within 30 minutes for 69% of main ED area, and the Door to Door time was within 2 hours for 69% of patients. 4% of patients returned within 72 hours; Thirty patients were admitted at the return visit. Conclusions: The ST clinic enhanced ED flow and contributed to reduction in ED congestion. It also provided a safe quality of care with a low return rate within 72 hours.

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Impact of EMS Assessment and Transportation on Outcomes of Patients with Acute Aortic Syndrome

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Background and Objectives: The quality of acute aortic syndrome (AAS) assessment in emergency medical service (EMS) and prehospital factors associated with survival remain unclear. Methods: Ishikawa Medical Control Council prospectively collected the data for clinical background, signs and symptoms, and 1-month survival from 2011 to 2014. Sensitivity and specificity of EMS for AAS assessment and factors associated with the outcome were analysed by multivariable logistic regression analyses. Results: Of 98,306 endogenous medical emergency cases transported by EMS, 3,838 were out-of-hospital cardiac arrest (OHCA), 2,637 of which were transported to core hospitals with high diagnostic capacity. The proportion of OHCA's due to AAS was higher in core hospitals than in other hospitals (7.3% vs. 4.3%, p<0.001). Of 22,057 non-OHCA cases with AAS-related symptoms, 330 had emergency medical technician (EMT)-assessed risk for AAS; of these, 195 had in-hospital AAS diagnosis. Of the remaining 21,727 cases without EMT-assessed risk, 166 were diagnosed with AAS. Therefore, at least 13 AAS cases/100,000 population were annually transported by our EMS with a sensitivity of 54.0% (95%CI:361) and specificity of 99.2% (21,579/21,745). EMTs assessed the risk less frequently when patients were elderly and presented with dyspnoea and syncope/faintness. Signs of upper extremity ischemia were rarely detected (6.9%) and absence of this sign was associated with lack of EMT-assessed risk. The calculation of modified aortic dissection detection risk score revealed that rigorous assessment based on this score might increase the EMS sensitivity for AAS. Multiple logistic regression analysis disclosed that Stanford type A, Glasgow coma scale ≤ 14 and admission to core hospitals performing emergency cardiovascular surgery were associated with 1-month survival. Conclusions: Survival from AAS is likely to be affected by rapid admission to appropriate hospitals providing cardiovascular surgery. A “aortic bypass” rule for aortic transportation and AAS centre should be established.

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Evaluation of A Modified South African Triage Score as A Predictor of Patient Disposition at A Tertiary Hospital in Rwanda

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Background and Objectives: Emergency Department triage processes have not been well-studied in Rwanda. The University Teaching Hospital of Kigali (UTH-K) is an urban health-center that utilizes a modified South African Triage Score (mSATS). The mSATS includes an early warning score, clinical discriminators and a color severity category. The mSATS classifies patients into five color categories to provide a standardized metric of acuity. Our objective was to evaluate if the mSATS accurately predicts patient disposition in the UTH-K ED. Methods: A retrospective review was conducted at UTH-K. Patients >15 years presenting to the ED from August 2015-July 2016 were eligible for inclusion. A random sample of cases was selected. Variables of interest included demographics, mSATS category, case type (injury or medical), and ED disposition. The likelihood of admission was evaluated based on the ED mSATS categorization using regression analysis yielding odds ratios (OR) with associated 95% confidence intervals (CI). A significance threshold of p<0.05 was used in all analyses. Results: From 1,438 cases randomly sampled the majority were male (61.9%) and the median age was 35 years. Injuries accounted for 56.7% of the cases. The likelihoods of admission for medical cases increased with increasing triage color categories: red with alarm having an OR = 7.80 (95% CI: 1.6-38.9), red without alarm OR = 3.58 (95% CI: 1.6-8.0), orange OR = 4.90 (95% CI: 2.5-9.6), and yellow OR = 3.61 (95% CI: 1.8-6.9), with statistical significance across all categories (p<0.05). For injured cases, the likelihoods of admission with increasing color category were not statistically significant (p>0.05), except for red without alarm OR = 4.63 (95% CI: 1.2-18.1, p = 0.028). Conclusions: The mSATS tool provided useful clinical guidance for hospital admission among medical cases. However in the injured, mSATS did not accurately predict disposition. To improve emergency care and triage in Rwanda, further studies are needed with a focus on trauma-specific triage systems.

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Long Term Outcome in Systemic Thrombolysis of Submassive Pulmonary Embolism: a Meta-analysis

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Background and Objectives: Massive Pulmonary Embolism (PE) accounts for 4.5% of all PE, and has a 90-day mortality rate of 52.4% compared with 14.7% for non-massive PE. Thrombolysis is an established treatment for massive PE but there is debate regarding its role for submassive PE. Multiple systematic reviews and meta-analyses have shown no statistically significant mortality benefit from systemic thrombolysis in submassive PE. However, a similar analysis for long-term outcome has not been conducted. The aim of this meta-analysis is to appraise the current evidence for the long-term benefit of systemic thrombolysis in patients presenting with acute submassive PE. Methods: A literature search was conducted from MEDLINE, EMBASE, Google Scholar, CINHAL, Cochrane Library, BestBets, BANDOLIER, and Trip databases for all randomized controlled trial (RCT) of systemic thrombolysis in submassive PE looking at long term complications after 90 days. Long-term outcomes include incidence of right ventricular dysfunction, incidence of chronic thromboembolic pulmonary hypertension (CTEPH) and incidence of recurrent PE. Results: Four relevant RCTs were identified involving 985 patients with submassive PE (including two multicentre trials). The incidence of right ventricular dysfunction/pulmonary hypertension was significantly lower in the thrombolysis group compared to anticoagulation alone (OR, 0.22; 95% CI, 0.11-0.44; p<0.0001). The incidence of recurrent venous thromboembolism was significantly lower in the thrombolysis group compared to the anticoagulation alone group. (OR, 0.14; 95% CI, 0.03-0.64; p=0.01). Conclusions: Based on the meta-analysis conducted, systemic thrombolysis in submassive PE reduces the incidence of right ventricular dysfunction/CTEPH and incidence of recurrent PE.

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Intramuscular vs. Oral Diclofenac For Acute Pain in Adults with Acute Musculoskeletal Injuries Presenting to the Emergency Department Setting: a Prospective, Double-blind, Double-dummy, Randomised

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Background and Objectives: The current study aimed to ascertain early post-medication pain reduction in participants presenting with acute musculoskeletal injuries (MSI) to the emergency department (ED) receiving intramuscular (IM) vs. per oral (PO) diclofenac. Methods: This was a prospective, double-blinded, randomised controlled -trial. Adults (18-65 years of age) presenting to the ED within 24 hours of acute musculoskeletal injuries, who had a triage pain score measured using Numerical rating scale (NRS) of at least 5 or above were enrolled in this trial. Participants were assigned (1:1) to either intramuscular (75 mg) or oral (100 mg) diclofenac group using a computer generated randomized concealed list in the blocks of six and eight. The primary objective was to evaluate and compare the proportions of IM vs. PO participants attaining a 50% reduction in pain score at 30 minutes from t0. Results: 300 participants were enrolled (150 in the IM diclofenac group and 150 in the PO diclofenac group) in the trial. The primary outcome was achieved in 99.3% (95% CI 96.3-100) in the intramuscular group and 86.7% (95% CI 80.2-91.7) in per oral group. There was an absolute risk difference of 12.7% which corresponds to a number needed to treat (NNT) of 8 cases (95% CI, 6-14) receiving IM rather than the PO diclofenac, in order to achieve one additional case of 50% pain reduction within 30 minutes of drug administration.

There were no adverse events experienced in any treatment group. Conclusions: IM diclofenac injection has relatively little advantage over per oral administration of diclofenac. Oral administration is preferable when and if clinical circumstances allow a choice in NSAID administration route.

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Going Rural and Remote: Practice Pearls For Emergency Physicians in Distant Locations

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Background and Objectives: A large segment of emergency work worldwide is practiced in rural and remote regions, not tertiary centers which are often over-represented in training. It is both challenging and fascinating work! While our training in emergency medicine unequivocally serves as our knowledge base in these locations, additional know-how and skills must be quickly acquired to not only survive, but to thrive in these challenging environments. Beyond just limited resources, additional challenges include unknown patient histories, unclear follow-up and responsibility for multiple patients with very limited or no back-up. This presentation illustrates five points to improve care and diagnosis by providers in remote regions. Methods: Through her eight years of work as a full-time rural and remote physician in Northern Canada and the deep Southern United States, the presenter has amassed practical pearls from colleagues and experience that improve patient outcomes and decrease practitioner stress. They are based on raw experience and backed by clinical practice guidelines in North America. Results: Why and how to prepare during the five minutes before the patient encounter. Being self-sufficient (with or without electricity) and what you need to have with you. Integral procedures to include in your skillset and how to alter prescribing patterns to better target the remote patient population. Sequential patient reassessment proves invaluable in decreasing sleepless nights and drastically limits the ordering of emergency ambulance flights. It can be performed anywhere, usually with great compliance from patients and endorsement from nursing. Conclusions: Remote emergency medicine will always be challenging by virtue of its remoteness and limited resources. By making small adjustments in preparation, treatment and follow-up techniques, providers can maximize their comfort level in working in these difficult locations. As these remote care environments are prevalent worldwide, these five points will resonate with a large proportion of emergency providers.

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The Impact of Emergency Interventions and Patient Characteristics on the Risk of Heart Failure in Patients with Nontraumatic OHCA

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Background and Objectives: Among patients with out-of-hospital cardiac arrest (OHCA), myocardial dysfunction is commonly noted during the early postresuscitation period. However, there has been no research on whether the likelihood of new-onset heart failure is increased during the long-term follow-up period in these patients. In this study, we aimed to analyze the impact of emergency interventions and patient characteristics on the risk of new-onset heart failure in nontraumatic OHCA patients. Methods: The Taiwanese government healthcare database contains data for 49,101 nontraumatic OHCA adult patients from 2011-2012, which were analyzed in this study. Nontraumatic OHCA patients who survived to the intensive care unit (ICU) were included as the study group (n=7,321). Matched patients (n=21,963) were recruited as a comparison group. Patients with any history of heart failure or cardiac arrest were not included in either group. All patients were followed for 6 months for the identification of new-onset heart failure. Adjustments were made for demographics, age, emergency interventions and comorbidities as potential risk factors. Results: 3.84% (n=281) of OHCA patients suffered new-onset heart failure, while only 1.24% (n=272) of matched patients in the comparison group suffered new-onset heart failure. Strong risk factors for heart failure were age (60-75 years, HR: 11.4; 95% CI: 9-14.4), medical history (myocardial infarction, HR: 2.47; 95% CI: 2.05-2.98 and cardiomyopathy, HR: 2.94; 95% CI: 1.45-5.94), and comorbidities during hospitalization (ischemic heart disease, HR: 4.5; 95% CI: 3.46-5.86). Only extracorporeal membrane oxygenation (ECMO) decreased the risk of heart failure. Most (53.6%) heart failure events occurred within 60 days after OHCA. Conclusions: An age from 61-75 years, a history of myocardial infarction or cardiomyopathy, and ischemic heart disease or infection as comorbidities occurring during hospitalization were strong risk factors for new-onset heart failure in OHCA patients. However, ECMO could decrease this risk. More importantly, most heart failure events occurred within 60 days after OHCA.

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Intraosseous Administration of Adrenaline Does Not Impair Uptake of...
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**Background and Objectives:** Intravascular (IO) catheterization is frequently used in medical emergencies, when venous access is difficult to achieve. Experimental data suggest that major hemorrhage and catecholamine administration both reduce bone marrow blood flow. To study the uptake of gentamicin as a tracer substance administered IO following adenalin administration in hemorrhagic shock and during cardiopulmonary resuscitation (CPR). **Methods:** 20 anesthetized pigs were exsanguinated by 50% of the blood volume. They then received injections of either: adenalin IO (n=5; Group 1), saline IO (n=5; Group 2), adenalin IO during cardiac arrest and CPR, (n=5; Group 3), or intravenous adenalin (n=5; Group 4). These injections were followed by an injection of gentamicin by the same route. In all animals, mixed venous antibiotic concentrations were analyzed at 5, 15 and 30 minutes after administration. **Results:** Hemorrhage with partial re-oxidation of the animals resulted in a lowered mean arterial pressure. After IO adenalin administration, within 10-20 sec. a marked increase in heart rate and blood pressure was noted in the groups with preserved cardiac activity. Mean (SD) concentrations at 5 minutes were 26.4 (2.3) mg/L in group 1, 26.6 (4.5) mg/L in group 2, 23 (4.5) mg/L in group 3 and 31.2 (12) mg/L in group 4. At 5 minutes, concentrations were not significantly different among the groups, but at 15 and 30 minutes they were higher in group 4 compared with the others (p<0.05). **Conclusions:** This study shows that IO injections of adenalin, given according to CPR protocol, does not impair the uptake of a subsequent injection of gentamin administered through the same IO needle. This study strongly indicates, that in the event of cardiac arrest, where adenalin is administered IO and there is a return of spontaneous circulation, where arrhythmias need to be treated, antiarrhythmic drugs can be administered IO at ordinary dosage.

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**Improving Experience For Discharged Ambulatory Patients From the Paediatric Emergency Department and to Create Cost Savings For the National Health Service (UK) and Families-QIP Using Nasa Techniques**

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**Background and Objectives:** Medically stable patients, who received IV antibiotics, are currently being discharged from our institution and ‘ambulated’ with an IV cannula in situ. They return daily until blood culture results become available. This has significant impact on resources and disrupts family life. Our aims were to try and create a leaner ambulating system using evidence-based recommendations on timing of antibiotic switch from IV to PO and to achieve time and cost savings for staff and patients. **Methods:** Ambulating patient lists from September 2017 to August 2018 were retrospectively looked at. Our inclusion criteria: 1) chase blood culture, if negative then change to oral, 2) chase blood culture, if negative then stop. Data was assessed using crew resource management techniques, a safety tool developed by NASA. **Results:** 1,847 ambulating events were analysed. 24.7% fulfilled our inclusion criteria. Average stay for an intravenous ‘push’ was 50 minutes. Patients returned on average twice. Almost 90% of patients could have been switched to PO on discharge. 100% of newborns fell into the ‘if negative then stop’ category and were unable to switch. Most common presentations, which could have been switched on discharge were cellulitis and ? septic children not needing admission. It was difficult to quantify how many patients required re-cannulation or experienced cannulation complications using the handover lists as the only source of clinical information. 1 patient, who fulfilled criteria for switching required re-admission due to inability to tolerate PO antibiotics. No re-admission due to clinical deterioration. **Conclusions:** Using current evidence-based recommendations on switching antibiotics from IV to PO in combination with bioavailability data for the most common antibiotics in our patients would achieve significant time and financial savings for parents and the NHS. NASA’s crew resource management techniques are a useful alternative to the commonly used SMART goal approach for QIPs.

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**Clinical Characteristics and Outcomes of Small Bowel-Small Bowel vs. Ileocolic Intussusception Diagnosed by Emergency Department Point-of-Care Ultrasound: a Retrospective Cohort Study**

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**Background and Objectives:** Point-of-Care Ultrasound (PoCUS) use in the Emergency Department (ED) allows bedside diagnosis of pathologies that previously required formal radiology consultation. Identifying intussusception is a feasible PoCUS application due to its ease-of-use and high accuracy. However, there is scant data regarding the diagnosis of small bowel-small bowel intussusception (SB-SBI) by PoCUS. The objective of this study was to describe the clinical characteristics and outcomes of SB-SBI relative to ileocolic intussusception (ICI) identified on PoCUS, comparing their clinical course and recurrence rates. **Methods:** This was a retrospective review at a single, tertiary-care, urban pediatric ED. All cases of intussusception diagnosed on ED PoCUS from November 2014 to December 2018 were reviewed. Demographics and clinical data, including presentation, type of intussusception, interventions, outcomes, and recurrences, were recorded. Interobserver agreement of the diagnosis with a second sonologist-physician blinded to the final diagnosis was calculated by Cohen’s kappa. **Results:** Thirty-five subjects were identified to have intussusception on ED PoCUS. Twenty subjects (57%) identified were SB-SBI. The median ages were 52 months (IQR 16.75 to 87.25) in the SB-SBI group and 15 months (IQR 2.75 to 30) in the ICI group (p<0.05). Two of 20 (10%) SB-SBI subjects required surgical intervention, while the rest spontaneously reduced. Fourteen of 15 (93%) ICI subjects required intervention. Cohen’s kappa was 0.78 (95% CI 0.58-0.98). **Conclusions:** SB-SBI may be recognized more frequently with the use of ED PoCUS. PoCUS can differentiate between variants of intussusception that range from a surgical emergency to a transient source of abdominal pain that may have gone otherwise unexplained. Routine use of Ed PoCUS may help clinicians triage patients with suspected intussusception and warrants further investigation.

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**Clinical Characteristics and Outcomes of Small Bowel-Small Bowel vs. Ileocolic Intussusception Diagnosed by Emergency Department Point-of-Care Ultrasound: a Retrospective Cohort Study**

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Significant Predictive Factors of the Severity and Outcomes of the First Attack of Acute Angioedema in Children
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Background and Objectives: The initial episode of angioedema in children can be potential life-threatening due to the lack of prompt identification and treatment. We aimed to analyze the factors predicting the severity and outcomes of the first attack of acute angioedema in children.

Methods: This was a retrospective study with 406 children (<18 years) who presented in the emergency department (ED) with an initial episode of acute angioedema and who had subsequent follow-up visits in the out-patient department from January 2008 to December 2014. The severity of the acute angioedema was categorized as severe (requiring hospital admission), moderate (requiring a stay in the short-term pediatric observation unit [POU]), or mild (discharged directly from the ED). The associations among the disease severity, patient demographics and clinical presentation were analyzed.

Results: In total, 109 (26.8%) children had severe angioedema, and the majority of those children were male (65.1%). Most of the children were of preschool age (56.4%), and only 6.4% were adolescents. The co-occurrence of pyrexia or urticaria, etiologies of the angioedema related to medications or infections, the presence of respiratory symptoms, and a history of allergies (asthma, allergic rhinitis, or atopic dermatitis) were predictors of severe angioedema (all p<0.05). Finally, the duration of angioedema was significantly shorter in children who had received short-term POU treatment (2.1 ± 1.1 days) than in those who discharged from ED directly (2.3 ± 1.4 days) and admitted to the hospital (3.5 ± 2.0 days) (p<0.001).

Conclusions: The co-occurrence of pyrexia or urticaria, etiologies related to medications or infections, the presence of respiratory symptoms, and a history of allergies were predictors of severe angioedema. More importantly, short-term POU observation and prompt treatment could shorten the clinical course.

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The Effect of Observation Status on Cranial Computed Tomography Rates in Children with Minor Head Trauma: the Australasian Paediatric Head Injury Rules Study (APHIRST)
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Background and Objectives: Management of children with minor head trauma often includes a period of emergency department (ED) observation to determine need for cranial computed tomography (CT). We explored the relationship between observation and cranial CT use.

Methods: This was a planned sub-analysis of a prospective observational study at 10 pediatric EDs. Children <18 years-old with Glasgow Coma Scale (GCS) scores ≥ 14 were enrolled. Clinicians documented if they planned to observe prior to CT decision. We compared median time [hours] and rate differences with the Hodges-Lehmann method. Controlling for hospital cluster effects using a generalized linear model with mixed effects, we estimated adjusted cranial CT use with multivariable logistic regression.

Results: Of 20,137 children enrolled, 19,481 (97%) had GCS scores ≥ 14 and documented observation status; 6,167 (32%) had a planned observation. Using the PE-CARN traumatic brain injury risk stratification: 19% of the very low-risk, 41% of intermediate-risk, and 66% of high-risk patients were observed. The overall cranial CT rate was 9%, and 0.8% had clinically important traumatic brain injuries (cTBI). The cranial CT rate was higher in those observed (20.5%) than those not observed (4.1%) (rate difference 16.3%, [95% CI: 15.3-17.4%]). The cTBI rate was higher in those observed (1.8%) compared to those not observed (0.4%) (rate difference 1.4%, [95% CI: 1.1-1.8%]). After adjusting for PE-CARN TBI risk group, patient, and hospital characteristics, cranial CT use was significantly associated with seizure (adjusted odds ratio 2.5, [95% CI: 1.8-3.5]), planned observation (adjusted odds ratio 3.3, [95% CI: 2.9-3.7]), intermediate risk (adjusted odds ratio 4.4, [95% CI: 3.7-5.3]), and high risk mechanism (adjusted odds ratio 23.6, [95% CI: 19.3-28.9]).

Conclusions: In a setting with a low overall cranial CT rate in children with minor head injury, planned observation, intermediate and high-risk mechanism were associated with increased CT use.

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“She’s Gone Now,” a Mixed Methods Analysis of the Experiences and Perceptions Around the Deaths of Children Who Died Unexpectedly in Health Care Facilities in Cape Town, South Africa
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Background and Objectives: The sudden death of a child is a catastrophic event not only for the family, but also for the healthcare workers involved. Confidential enquiries provide a biomedical depiction of the processes and quality of care delivered and drive improvements in care. However, these rarely include an assessment of the patients’ caregiver, their perception of the quality of care. Methods: A parallel convergent mixed methods design was used to contrast and compare medically-assessed clinical quality of care with caregiver perceptions of quality and care in a cohort of sudden childhood deaths in emergency facilities in Cape Town, South Africa.

Results: Amongst the 29 sudden childhood deaths, clinical quality of care was assessed as poor in 11 (38%) and the death was considered avoidable or potentially avoidable in 16 (55%). The main themes identified from the caregivers were their perception of the quality of care delivered (driven by perceived healthcare worker effort, empathy and promptness), the way the family was dealt with during the final resuscitation, and communications at the time of and after the death. Ten (35%) caregivers were predominantly negative about the care delivered, of whom four received fair clinical quality of care, 13 (49%) of caregivers had predominantly positive experiences, one of who received poor clinical quality of care. Conclusions: Caregivers’ experiences of the healthcare service around their child’s death are influenced largely by the way healthcare workers communicate with them, as well as the perceived clinical effort. This is not always concordant with the clinically assessed quality of care. Simple interventions such as protocols and education of healthcare workers in dealing with families of a dying or deceased child could improve families’ experiences at a time when they are most vulnerable.

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Exposure and Confidence with Critical Non-airway Procedures: a Global Survey of Paediatric Emergency Medicine Physicians
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Background and Objectives: Children rarely experience critical illness, resulting in low exposure of emergency physicians (EPs) to critical procedures. Our primary objective was to describe senior EP confidence, most recent performance and/or supervision of critical non-airway procedures. Secondary objectives were to compare responses between those who work exclusively in PEM and those who do not, and to determine whether confidence changed for selected procedures according to increasing patient age. Methods: Survey of senior EPs working in 96 emergency departments (EDs) affiliated with the Pediatric Emergency Research Networks (PERN). Questions assessed training, performance, supervision, and confidence in 11 non-airway critical procedures, including CPR, vascular access, chest decompression and cardiac procedures. Results: Of 2,446 physicians, 1,503 (61%) responded to the survey. Within the previous year, only CPR and insertion of an intraosseous needle (IO) had been performed by at least 50% of respondents: over 20% had performed defibrillation/DC cardioversion. More than 50% of an intraosseous needle (IO) had been performed by at least 50% of respondents: over 20% had performed defibrillation/DC cardioversion. More than 50% of an intraosseous needle (IO) had been performed by at least 50% of respondents: over 20% had performed defibrillation/DC cardioversion.
of respondents had never performed or supervised ED thoracotomy, pericardiocentesis, venous cutdown or transcutaneous pacing. Self-reported confidence was high for all patient age groups for CPR, needle thoracocentesis, tube thoracotomy, IO insertion and defibrillation/DC-cardioversion. Confidence levels increased with increasing patient age for central venous and arterial line insertion. Respondents working exclusively in PEM were more likely to report being at least somewhat confident in defibrillation/DC-cardioversion, IO insertion, and central venous line insertion in particular age groups; however, they were less likely to be at least somewhat confident in ED thoracotomy and transcutaneous pacing. **Conclusion:** CPR and IO insertion were the only critical non-airway procedures performed by at least half of EPs within the previous year. Confidence was higher for these procedures, and needle and tube thoracotomy. These data may inform the development of continuing medical education activities to maintain pediatric procedural skills for emergency physicians.

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**FS_PED_01_08**

Lignocaine/phenylephrine Nasal Spray Does Not Reduce the Pain and Distress of Nasogastric Tube Insertion in Young Children Compared to Placebo: a Randomized Controlled Trial

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**Background and Objectives:** Nasogastric tube insertion (NGTI) is a painful and distressing emergency department procedure. Although commonly used in adults, there is little information on the effectiveness of a local anesthetic agent to be at spray for this procedure in children. The study objective is to compare the efficacy of a proprietary preparation of lignocaine/phenylephrine nasal spray to placebo for pain and distress associated with NGTI in young children. **Methods:** Prospective, randomised, controlled, double-blind superiority trial of intranasal lignocaine-phenylephrine or 0.9% sodium chloride placebo in a convenience sample of 100 children aged 6 months to 5 years undergoing NGTI. Parents, observers, and those inserting the nasogastric tube were all blinded to the intervention. The primary outcome was pain/distress, measured with the Face, Legs, Arms, Cry and Consolability (FLACC) rating scale. Secondary outcomes included observer and parent ratings of pain and distress using a visual analog scale (VAS). Scores were compared using the Wilcoxon rank-sum test, while categorical outcomes were compared using the Chi-squared test or Fisher’s exact test as appropriate. **Trial registration:** ACTRN12614000929695. **Results:** There was no difference in median FLACC score at time of NGTI (9 [IQR 7–10] for lignocaine/phenylephrine vs. 9 [IQR 8–10] for placebo; p = 0.21), or at any other time during the procedure. Median parent-rated VAS for pain 4.5 [IQR 1.8–6.6] for lignocaine/phenylephrine and 4.5 [IQR 2.7–6.4] for placebo; p = 0.72. There was no difference in any other secondary outcomes. **Conclusions:** Lignocaine/phenylephrine nasal spray does not reduce pain and distress associated with nasogastric tube insertion in young children compared to placebo.

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**FS_CCM_02_04**

Study of Relationship Between Procalcitonin Level and the Severity of Sepsis

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**Background and Objectives:** Procalcitonin (PCT) plays a supporting role in diagnosis of sepsis for the critical patients. We usually measure PCT level in the case of suspected sepsis in the Emergency Department. We investigated relationship between PCT level and the severity of sepsis. **Methods:** In this study, we enrolled 198 patients who were diagnosed with sepsis at the Department of Emergency and Critical Care Medicine, Kansai Medical University Hospital between January 2015 and March 2018. The relationship between PCT level and the Sequential Organ Failure Assessment (SOFA) score, septic shock, and disseminated intravascular coagulopathy (DIC) were analyzed. In addition, we investigated the relationship between PCT level and the cause of sepsis. **Results:** The group of the patients who had higher PCT levels had a tendency of the higher SOFA scores.
DIC. However, PCT levels were not related with the causes of sepsis or the results of blood cultures. **Conclusions:** PCT levels of sepsis patients at hospitalization tend to correlate with SOFA scores namely can reflect sepsis severity. On the other hand, PCT levels had no relationships the causes of sepsis or the type of bacteria. **Corresponding Author:** Kentaro Kajino (kajinok@hiralata.kmu.ac.jp)

**FS_CCM_02_05**

**Predictors of In-hospital Mortality in Sepsis in the Emergency Department in a Philippine University Hospital: a Prospective Observational Study**

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**Background and Objectives:** Sepsis is a critical condition caused by dysregulated immune response to infection. Currently, the incidence and clinical characteristics of patients with sepsis in Philippine emergency departments have not been well established. The objective of this study was to determine clinical characteristics as independent predictors of 28-day in-hospital mortality from sepsis. **Methods:** A single-center prospective observational study was done over a four-month period utilizing the quick Sepsis Related Organ Failure Assessment (qSOFA) as main eligibility criteria. **Results:** During the study period, 376 out of 10,699 admitted patients at the emergency department were identified with sepsis using the qSOFA criteria. A total of 208 adult patients were included in the analysis. The survival and mortality groups in this cohort were similar in terms of age, gender, co-morbid conditions, and acquisition of infection. Pneumonia (66%) is the most common infection observed in this population. Univariate analysis of clinical characteristics showed that shock index ≥ 1.3 (OR 1.95; 95% CI 1.12-3.41), the need for fluid resuscitation (OR 2.53; 95% CI 1.44-4.43), and early positive culture growth (OR 2.91; 95% CI 1.49-5.68) were significantly associated with in-hospital mortality. Multiple regression analysis identified arterial base deficit (OR 1.10; 95% CI 1.03-1.18), the need for vasopressors upon admission (OR 7.81; 95% CI 2.25-27.18), Gram-negative bacteremia (OR 9.14; 95% CI 1.35-62.08), and the need for invasive mechanical ventilation (OR 36.91; 95% CI 13.49-100.97) as predictors independently associated with in-hospital mortality. **Conclusions:** In this study, arterial base deficit, the need for vasopressors upon admission, Gram-negative bacteremia, and the need for invasive mechanical ventilation were determined to be independent predictors of in-hospital mortality among adult patients with sepsis in the emergency department.

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**FS_CCM_02_06**

A Study Using Common Carotid Velocity Time Integral (CCA VTI) to Assess Volume Responsiveness

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**Background and Objectives:** The concept of balance fluid resuscitation is crucial as 50% of patients presented to Emergency Department are hypovolemic and are fluid responder. Therefore, the applicability of POCUS (Point of Care Ultrasound) in guiding the fluid administration is important as it provide real-time hydration status and detect the complications that might arise from it. Acknowledging the difficulties of obtaining LVOT VTI image by an inexperienced operator, this study described the use of CCA VTI Variation Index as a dynamic sonographic parameter that can be used to assess the volume responsiveness in critical ill patients in the Emergency Department. **Methods:** A total of 61 patients who fulfilled the inclusion criteria were recruited. Bedside POCUS was performed prior to initiation of fluid therapy. LVOT VTI of > 10% was used as gold standard to suggest volume responsiveness. CCA VTI Variations were calculated before and after passive leg raise at initial evaluation and after fluid administration. **Results:** This is the first study within our knowledge that described the CCA VTI Variation Index usage for detection of volume responsiveness. The study showed that the AUC for CCA VTI Variation was 0.85 ± 0.06 (CI 0.74-0.97; p < 0.05). From the ROC analysis, CCA VTI Variation cut off value of volume responsiveness in relation with LVOT VTI Variation of more than 10% were obtained; 9.42% (sensitivity 90.6%; specificity 33.3%), 15.56% (sensitivity 81.3%, specificity 83.3%) and 20.7% (sensitivity 53.7% and specificity of 100%) on the ROC. The accuracy of this parameter in relation with LVOT VTI Variation was 71.7%. **Conclusions:** CCA VTI Variation is least sensitive but its specificity is comparable with LVOT VTI Variation. It can be used as a diagnostic tool for hemodynamic monitoring of dengue fever patient in Emergency Department.

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**FS_CCM_02_07**

**Diagnostic and Prognostic Value of Pentraxin-3 among Patients with Sepsis and Septic Shock Diagnosed at Emergency Department According to Sepsis-3 Definitions**

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**Background and Objectives:** Despite preexisting diagnostic criteria for sepsis, definite diagnosis of sepsis is usually difficult and challenging due to unknown source of infection or the vague definitions of sepsis syndrome. Some biomarkers were proposed to help clinicians to rapidly diagnose sepsis. Pentraxin-3 (PTX-3), a novel biomarker, is known to be increased in various infections, but its clinical value in sepsis has been controversial. The purpose of this study was to investigate the clinical value of PTX-3 among the patients with sepsis and septic shock diagnosed at emergency department (ED) in accordance with Sepsis-3 definitions. **Methods:** A total of 143 subjects were enrolled. The study included 51 patients with sepsis, 46 patients with septic shock and 46 healthy volunteers. We measured serum levels of PTX-3, interleukin-6, procalcitonin and CRP. Follow-up PTX-3 levels were measured among the patients with initial septic shock within 24 hours from hospital discharge. **Results:** Serum PTX-3 levels could discriminate sepsis from controls (range of AUC 0.94-0.99, p < 0.001) with the cut-off value of 6.02 ng/mL (sensitivity 92.6%, specificity 97.4%). Serum PTX-3 levels were able to discriminate septic shock (range of AUC 0.77-0.90) with the cut-off value of 12.05 ng/mL (sensitivity 93.2%, specificity 60.7%). PTX-3 levels showed a positive correlation with PCT (rho = 0.648, p < 0.001), IL-6 (rho = 0.579, p < 0.001), CRP (rho = 0.476, p < 0.001) and lactate (rho = 0.397, p < 0.001). 28-day mortality was significantly higher in high PTX-3 (≥ 12.05 ng/mL) group than in low PTX-3 (< 12.05 ng/mL) group (p = 0.046). Both initial and follow-up PTX-3 levels of septic shock patients who died during admission were consistently significantly higher than those of septic shock patients who recovered (p = 0.004 in initial, p < 0.001 in follow-up). **Conclusions:** PTX-3 shows diagnostic and prognostic value for sepsis and septic shock diagnosed at ED in accordance with Sepsis-3 definitions.

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**FS_CCM_02_08**

**Improved Mortality in Emergency Department Sepsis Score with Inclusion of Heart Rate Variability and Clinical Variables**

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**Background and Objectives:** Heart Rate Variability (HRV) analysis provides a quick and non-invasive method to evaluate cardiovascular autonomic dysregulation in sepsis. Studies have demonstrated that HRV parameters correlate well with immune response to infection. Currently, the incidence and clinical characteristics of sepsis in Emergency Department are not well understood. The objective of this study was to test whether the integration of HRV parameters with clinical variables into the MEDS score to enhance its predictive performance. **Methods:** In this retrospective observational study, adult patients presenting to the Emergency Department were diagnosed at Emergency Department (ED) in accordance with Sepsis-3 definitions. Studies have demonstrated that HRV parameters correlate well with immune response to infection. Currently, the incidence and clinical characteristics of sepsis in Emergency Department are not well understood. The objective of this study was to test whether the integration of HRV parameters with clinical variables into the MEDS score to enhance its predictive performance. **Methods:** In this retrospective observational study, adult patients presenting to the ED with suspected sepsis and fulfilling Systemic Inflammatory Response Syndrome (SIRS) criteria were recruited. Primary outcome was 30-day In-Hospital Mortality (IHM). HRV variables were obtained through six-minute single-lead electrocardiogram tracings. Clinical and HRV variables of patients who did or did not meet the primary outcome were compared on univariate analysis. Variables with p < 0.2 were entered as covariates with the MEDS score in a logistic regression model for prediction of 30-day IHM. **Results:** The predictive value of the improved MEDS score (i-MEDS) was compared against the original MEDS score on receiver operating characteristic (ROC) analysis. **Results:** Of the 214 patients included, 40 patients (18.7%) had IHM. i-MEDS incorporated two additional HRV parameters into the MEDS score to enhance its predictive performance. **Methods:** In this retrospective observational study, adult patients presenting to the ED with suspected sepsis and fulfilling Systemic Inflammatory Response Syndrome (SIRS) criteria were recruited. Primary outcome was 30-day In-Hospital Mortality (IHM). HRV variables were obtained through six-minute single-lead electrocardiogram tracings. Clinical and HRV variables of patients who did or did not meet the primary outcome were compared on univariate analysis. Variables with p < 0.2 were entered as covariates with the MEDS score in a logistic regression model for prediction of 30-day IHM. **Results:** The predictive value of the improved MEDS score (i-MEDS) was compared against the original MEDS score on receiver operating characteristic (ROC) analysis. **Results:** Of the 214 patients included, 40 patients (18.7%) had IHM. i-MEDS incorporated two additional HRV variables (standard deviation of N-N and triangular interpolation of N-N interval histogram) and 2 clinical variables (temperature at presentation and comorbidity...
ischemic heart disease). i-MEDS performed with area under the ROC curve (AUC) of 0.901 (95% CI 0.845-0.957), compared to AUC of 0.879 (95% CI 0.825-0.933) for the original MEDS score. MEDS score ≥11, MEDS score ≥12 and i-MEDS ≥0.289 performed at sensitivities of 77.5%, 75%, and 80% respectively, and specificities of 76.4%, 84.4%, and 89.1% respectively. Conclusions: Inclusion of HRV and clinical variables into the MEDS score further strengthened its ability to predict sepsis mortality.

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Fit CPR Fun Run: A New Way to Engage Lay Public For CPR
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Background and Objectives: The best chance of survival from a heart attack was to initiate Cardiac Chain of Survival as soon as possible. Early recognition and early bystander CPR are the cornerstones of strategy. The incidence of bystander CPR for out of hospital cardiac arrest in Malaysia is very low. Among the reasons were lack of awareness, skepticism on learning CPR, lack of regular training opportunities, and absence of easy-fun of learning it. We introduce a novel methods of teaching CPR to the lay public called Fit CPR. This program comprises of sports activity and CPR. The objectives: 1. To create an awareness of the importance of CPR among the lay public. 2. To promote the learning of CPR through a fun way
Methods: A fun-run activity was organized that incorporated a simple music-driven outdoor-local-flavor-mass hands-only CPR. The preparation starts eight months prior where the route including CPR checkpunts and safety component was identified. Flash mob, social and mass media, sport and TV personalities were engaged for event promotion. A tagline “Learn CPR, Save Lives” was created. Police and our local ambulances team provide coverage and support during the event. During the event, participants needed to undergo a 10-min practice session, followed by a 5-km run, 5-min rest and re-performance of the mass-hands-only-music-driven CPR. The practice session was led by the lead instructor, assisted by demonstrators and facilitators. Finally, participants were assessed for their CPR performance. Those who complete the whole events was given a medal. Results: 800 participants ranging from 5 to 70 years old. They completed the cycle of mass CPR training, running, rest and re-assessment without any unwanted event. Majority of them able to perform CPR satisfactorily and they enjoyed the event very much.
Conclusions: Awareness and skills of CPR can be instilled and propagated in a fun way
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Two Low-cost Models For Ultrasound-guided Pericardiocentesis Training
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Background and Objectives: Pericardiocentesis is a rare but life-saving procedure, making simulation essential in maintaining competency. We constructed two low-cost, ultrasound-compatible pericardiocentesis models. The first was an agar-based model with a water-filled balloon embedded within. A newer model (Centesys) was devised with psyllium to simulate subcutaneous tissues and allowed making simulation essential in maintaining competency. We constructed two low-cost models to simulate pericardiocentesis. The new model (Centesys) was compared to the agar-based model (median 4, IQR 4.5-6) vs. median 4, IQR 4.5-6.25 vs. median 4, IQR 4.4, p = 0.001), with greater participants’ satisfaction (median 5, IQR 5.6 vs. median 4, IQR 3.7-5.4, p < 0.001). After training with Centesys, learners achieved a higher median score in competency than with the agar model based on the assessment checklist (median 45, IQR 44-47 vs. 36.5, IQR 35-38.3, p < 0.001). Conclusions: Centesys was more realistic and effective in training of ultrasound-guided pericardiocentesis.
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The AURA Study: Assessing Usefulness of Virtual Reality Mobile Application in Flexible Videoscopic Airway Training
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Background and Objectives: Flexible videoscopic orotracheal intubation (FOI) is an important management option in predicted difficult airways. There is a significant learning curve to master this complex psychomotor skill. It is rarely performed in daily practice, yet emergency physicians are expected to execute the technique efficiently during a crisis scenario. Conventional teaching commonly utilizes low-fidelity manikins, which lack realism of live anatomy. Virtual reality (VR) technology may enhance the learning experience. We examined the effect of incorporating VR mobile application (Airway Ex) into FOI training in emergency medicine (EM).
Methods: We conducted a randomized (1:1) controlled trial in the Emergency Department, stratified by seniority (non-EM-trained vs. EM-trained physicians). All participants underwent conventional didactic teaching and low-fidelity simulation with trainer’s demonstration and hands-on practice. Participants in the intervention group received an additional 30 minutes of self-directed learning using the mobile application. Primary outcome was time taken to visualisation of the vocal cords and orotracheal tube placement (i.e. successful intubation). Manipulation skill quality of the participants was graded using a previously-validated 5-point rating scale. Trainers and assessors were blinded.
Results: Forty-five physicians (20 non-EM-trained and 25 EM-trained physicians) were recruited. There was no difference in the time taken to visualize the vocal cords (median 13 seconds [interquartile range (IQR) 9-38] vs. 12 seconds [IQR 8-22], p = 0.36) and to successful intubation (median 48 seconds [IQR 41-69] vs. 44 seconds [IQR 37-60], p = 0.23) in the control and intervention groups. In the non-EM-trained strata, the intervention group took a shorter time to successful intubation (median 38.5 seconds [IQR 33-53] vs. 49.5 seconds [IQR 43-62], p = 0.09), although this result did not reach statistical significance. The intervention group received significantly higher ratings of manipulative skill quality compared to the controls (overall: p = 0.04; non-EM-trained strata: p < 0.01). Conclusions: Integrating VR technology in FOI teaching enhanced the quality of skill acquired, particularly among the non-EM-trained physicians.
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The Use of FOAM in the Undergraduate Emergency Medicine Education: IEM Project
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Background and Objectives: International Emergency Medicine Education Project is a non-profit project provides free, reusable educational resources for undergraduate medical trainees and educators. This study aims to understand demand and presents the usage results of the project in different online platforms.
Methods: Project’s main platform is a website (iem-student.org) and consist of chapters, posts, clinical images/videos, audios provided by 132 contributors from 4 continents including 17 countries. The data of webpage, clinical image, video and audio archives were analyzed for 3 months of testing period (June-August 2018).
Results: There were 240 pages/posts shared during the study period. The total number of website views and visitors were 13,778 and 6,625, respectively. Although increasing trend by views and visitors by months, there was no overall significance (p = 0.065 and p = 0.074). Views were from 117 counties [Turkey (21.5%), Mexico (17.5%), USA (14.0%), UAE (8.5%), Russia (2.6%), and others]. English was the official language in 22 (19%) countries. America continent viewed significantly higher than other continents (p = 0.042), followed by Asia and Europe. 53% (7,336) views were referred by Twitter (47.9%), Facebook
the shape of the wound and did not have any measurements of the wound recorded. Only 6/111 (5.4%) of injuries were described from an anatomical point and 5/111 (4.5%) recorded the colour of the wound. **Conclusions:** The results demonstrate frequent misuse of wound terms together with poor adherence to acceptable injury documentation standards. The importance of applying the correct terminology when describing injuries in a medico-legal context cannot be overstated.

The results of this study are reflected in the literature where poor documentation of wound margins and wound dimensions have been reported. A literature search shows there is no other work which looks at doctors’ abilities to describe wounds correctly; therefore, this paper is valuable, worthwhile, and adds to the current literature.

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**NEWLY INTRODUCED SIMULATION TRAINING COURSE ON INTRAHOSPITAL TRANSPORTATION OF ACUTELY AND CRITICALLY ILL PATIENTS IN JAPAN**

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**Background and Objectives:** Intrahospital transportation of acutely and critically ill patients carries inherent risks that can be prevented and/or mitigated. Accordingly, it is necessary to safely and surely transport inpatients based on the guidelines. However, standardization of intrahospital transportation has not been established.

We think it is possible to teach proper knowledges and skills on intrahospital transportation when we used high-fidelity simulator and developed a 2-hour training course. **Methods:** Training course includes a brief didactic lecture, simulation scenario session using high-fidelity simulator, and debriefing. Instructor gives a lecture on the importance of safe intrahospital transportation. Then, attendees are provided for simulation drills. Educational effectiveness was analyzed through the simulation questionnaire and simple examination paper before and after the course. The questionnaires are: A. knowledge acquisition about safe intrahospital transportation, B. promotion of understanding by simulation scenario session, and C. levels of understanding of value to use checklist for intrahospital transportation. **Results:** Twenty-three attendees participated in the survey. According to the surveillance, the numbers of attendees who scored more than four points out of five were as follows: A was 16 (80.0%), B was 16 (80.0%), and C was 15 (75.0%), respectively.

The number of correct answers increased from 2.0 to 2.4 out of 4 (p < 0.005). Attendees can obtain relevant knowledges and skills by short time training course. Acutely and critically ill patients are at increased risk of morbidity and mortality during intrahospital transportation due to lack of insight and decent education. We have to recognize that jeopardies at the intrahospital transportation can be prevented and mitigated and all healthcare providers must be trained by efficient training. **Conclusions:** Newly introduced training course on intrahospital transportation with simulation scenario session is effective and efficient because it helps in providing enough clinical knowledges and skills for healthcare providers.

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**WHEN IS A LACERATION AN ABRASION? WOUND DESCRIPTIONS IN THE EMERGENCY DEPARTMENT**

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**Background and Objectives:** Each year over 130,000 patients present to the Emergency Department following an alleged assault in the UK. These patients’ notes may hold enormous medico-legal importance as evidence a crime occurred and provide a clue as to the mechanism of injury. It is therefore imperative that records are complete and accurate for use in any possible criminal or civil suit that may later arise. **Methods:** This was a retrospective study aiming to investigate if doctors working in a busy teaching hospital recorded the description of wounds sustained following alleged assault accurately. 126 case notes were examined against established criteria. The paper provides an educational aspect when the correct description of different types of wounds are provided with photographic accompaniment. **Results:** 111/126 (88.1%) patients had a wound following the alleged assault. Types of wounds documented were laceration (30.6%), bruise (14.4%), swelling (12.6%), abrasion (9%), incision (4.5%), haematoma (3.6%) and stab (1.8%). 9/34 (26.5%) misused the term ‘laceration’. ‘Abrasion’ was also misused (one was sutured). The majority of patients did not have a description of...
ed music intervention in addition to routine care. Participants self-selected to in-
tervention or control groups, and were reassessed at two hours. Assessment mea-
sures included 3-minute diagnostic Confusion Assessment Method (3D-CAM),
rates of recorded delirium diagnosis, and secondary outcomes such as pain, agitation,
and length of stay. Results: 25 intervention and 19 control participants were
recruited. There was a statistically significant difference in the change in pain
scores between groups (p=0.0004) and median length of stay was higher in the
intervention group (6 vs. 5.5, p<0.0001). Although statistical significance was not
reached in other differences between groups, absolute proportions demonstrated
greater improvements in delirium severity, pain, and abnormal agitation levels in
the intervention group. Conclusions: This study found that this intervention was
feasible, although not across all potentially eligible older ED populations. Al-
though this study found clinically meaningful differences between groups, it was
insufficiently powered due to enrolment and implementation challenges. As a re-

result, we believe targeted music interventions may have a role in managing preva-
lent delirium, pain, and agitation/sedation among older ED adults, however we
plan a much larger trial with alterations in methodology to increase recruitment,
and thus our ability to detect significant differences between intervention and con-
trol groups.

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Geriatric Collaboration Improves Patients’ Outcome in an Emergency
Department
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Background and Objectives: Geriatric patients present a unique health care chal-
lenge in an emergency department (ED) and often they are discharged with un-
recognized or unresolved remediable problems. The emergency department sees
an influx average of 1,000 elderly patients a month with complex medical condi-
tions and with the number set to increase, it is critical for the team to shift the cur-
rent paradigm of care in A&E. The project aims to: 1. Perform Opportunistic
screening for early pick up of Geriatric issues at A&E and linking up to Geriatric
specialist for timely intervention. 2. Ensure early detection of geriatric syndromes
and safe discharge to ensure safe discharges for elderly patients, 78 years and above
from ED. Methods: Emergency Department collaborates with Geriatric teams to
develop a Geriatric screening and assessment process for patients aged 78 years
old and above. AIM: 1: Established the A&E Geriatric Assessment form with stan-
dardized Geriatric assessment tools used throughout inpatients and SOC. 2. Estab-
lish the workflow and work process for the role of Emergency Geriatric nurse, and
link up the services with the various departments. Results: The role of A&E Geria-
tric nurse has started since 18 April 2017 to current and 980 Geriatric patients have
been screened for issues of Falls, Giddiness, Constipation. 626 Geriatric patients
were assessed and right-site to appropriate care providers in the community. 588
average bed stay saved with 70 patients were discharged with Geriatric Early Re-
view Clinic referrals. Conclusions: The project has helped to detect early geriatric
syndromes for elderly patients and right-site them to the appropriate health care
provider for follow-up. By doing so, it prevents hospitalization for some, which
can increase their risk of infection, risk of deconditioning and delirium.

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Equation For Calculated Osmolarity in the Thai Elderly Emergency
Department Patients and Its Accuracy
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Background and Objectives: The older people are more susceptible to be dehydrat-
ed due to their physiological changes and downs-regulated thirst response. Among
literatures, serum osmolarity remains the gold standard to diagnose water-loss de-
hydration. This study aims to develop an equation which specifically use to calcu-
late osmolarity in older Asian adults. Furthermore, our study compared the prop-
osed equation’s accuracy with equations published previously. Methods: This
study was a secondary analysis of a prospective cohort study. We enrolled all pa-
tients aged 65 years and older who visited to our emergency department (ED)
with during the period from 15 May 2017 to 31 July 2017. We used the multiple
logistic regression to develop a new calculated osmolarity equation from obtained
patients’ laboratory data compared with measured serum osmolarity. The new

equation was compared the ability to diagnose dehydration (calculated osmolar-
ity>300 mOsm/kg) with other 5 equations in receiver operating characteristic
(ROC) plot. The method of Bland-Altman was used to assess the mean difference
of each equation. Results: A total of 322 participants were included to this study.
The new equation originated from our older patients’ data was 1.75 x
(Na+K)+0.9 x Glucose + Urea -25.7, all in mmol/L. This equation had highest
ROC-AUC 0.81 when compared with other equations. A mean difference (MD)
between calculated and measured osmolarity was 0.49 mOsm/L (95% CI -0.40 to
1.38). While the Equation 1, 2, 3, 4, and 5 showed ROC-AUC 0.73, 0.80, 0.78,
0.80, and 0.80 respectively. The MD were 6.18 (95% CI 5.13 to 7.23), -0.18 (95%
CI-1.07 to 0.71), 24.06 (95% CI 23.12 to 25.00), -2.85 (95% CI -3.76 to -1.94),
and -5.31 (95% CI -6.20 to -4.41) respectively. Conclusions: We have developed a
new equation which showed a good performance in calculating osmolarity and
predicting dehydration. However, further validation of this equation should be as-
essed.

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Characteristics of Emergency Department Visits by Community-
dwelling Older Adults Who Screened Positive For Elder Abuse During
Home Care Assessments
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Background and Objectives: This study aims to examine the characteristics of com-
munity-dwelling older adults who screened positive for elder abuse during home care
assessments and the epidemiology of ED visits by these patients relative to other
home care patients. Methods: This study utilized a population-based retro-
spective cohort study of home care patients in Canada between April 1, 2007 and
March 31, 2015. Standardized, comprehensive home care assessments were ex-
tacted from the Home Care Reporting System. A positive screen for elder abuse
was defined as at least one these criteria: fearful of a caregiver; unusually poor
hygiene; unexplained injuries; or neglected, abused, or mistreated. Home care as-
sessments were linked to the National Ambulatory Care Reporting System in the
regions and time periods in which population-based estimates could be obtained
to identify all ED visits within 6 months of the home care assessment. Results: A
total of 30,413 from the 2,401,492 patients (1.3%) screened positive for elder abuse
during a home care assessment. They were more likely to be male (40.5%
vs. 35.3%, p<0.001), to have a cognitive impairment (82.9% vs. 65.3%,
p<0.001), a higher frailty index (0.27 vs. 0.22, p<0.001) and to exhibit more de-
pressive symptoms (depression rating scale ≥ 1: 68.7% vs. 42.7%, p<0.001). Care-
giver expressing distress was associated with elder abuse (35.3% vs. 18.3%,
p<0.001) but not a higher number of hours caring for the patient. Victims of elder
abuse were more likely to attend the ED for low acuity conditions. ED diagnosis
were similar with the exception of acute intoxication that was more frequent in
patients who are victims of abuse. Conclusions: Elder abuse is infrequently detect-
ed during home care assessments in community-dwelling older adults. Patients
who are victims of elder abuse are attending EDs more frequently for low acuity
conditions but ED diagnosis at discharge, except for acute intoxication, are simi-
lar.

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Aggressive Treatment Was Not Associated with Decreased In-hospital
Mortality in Oldest-old Patients: a Retrospective, Single-center
Observational Study
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Background and Objectives: The oldest-old population (age ≥ 90 years) has dou-
bled in Japan between 2004 and 2017. Accordingly, the proportion of oldest-old patients has been increasing rapidly in Japanese emergency departments. The aim of this study was to clarify the effectiveness of aggressive treatment for decreasing in-hospital mortality in oldest-old patients. **Methods:** We analyzed 356 patients aged ≥90 years who were brought to our emergency department and were admitted to our 800-bed general hospital between September 2017 and August 2018. We retrospectively reviewed their medical records to investigate background factors, treatments, and outcomes. We defined aggressive treatment as intubation, pressor infusions, operations, and radiological interventions. **Results:** The median age of the patients was 93 (range 90-106) years, and 36 patients were admitted 2 or more times in this period. Of the 356 patients, 120 (33.7%) were admitted for infectious diseases such as pneumonia and urinary tract infection. A Do Not Attempt to Resuscitate (DNAR) order was in place for 49.4% of the patients. Aggressive treatment was given to 41 patients. Fifty-three patients (14.9%) died and 217 patients (61.0%) were discharged home or to a nursing facility. In-hospital mortality was 17.1% in patients who received aggressive treatment and 14.6% in those who did not (p = 0.64). Increased in-hospital mortality was significantly associated with preexisting impairment in activities of daily living (p = 0.003) and Glasgow Coma Scale score ≤ 13 on admission (p < 0.001). After adjusting for these two variables, the adjusted odds ratio for in-hospital mortality with aggressive treatment was 0.83 (95% confidence interval 0.31-2.20). **Conclusions:** Aggressive treatment might not improve in-hospital mortality in oldest-old patients.

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**A Systematic Review of Outcomes Following Emergency Transfer to Hospital For Residents of Aged Care Facilities**

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**Background and Objectives:** Residential aged care facility (RACF) resident numbers are increasing. Residents are frequently frail with substantial co-morbidity, functional and cognitive impairment with high susceptibility to acute illness. Despite living in facilities staffed by health professionals, a considerable proportion of residents are transferred to hospital for management of acute deteriorations in health. This model of emergency care may have unintended consequences for patients and the healthcare system. This review describes available evidence about the consequences of transfers from RACF to hospital. **Methods:** A comprehensive search of peer-reviewed literature using four electronic databases. Inclusion criteria were participants living in RACF, aged at least 65 years, and studies reported outcomes of acute ED transfer or hospital admission. Findings were synthesized and key factors identified. **Results:** Residents of RACF frequently presented severely unwell with multi-system disease. In-hospital complications included pressure ulcers and delirium, in 19% and 38% of residents respectively; and up to 80% experienced potentially invasive interventions. Despite specialist emergency care, mortality was high with up to 34% dying in hospital. Furthermore, there was extensive use of healthcare resources with large proportions of patients undergoing emergency ambulance transport (up to 95%), and inpatient admission (up to 81%). **Conclusions:** Acute ED transfer is a considerable burden for residents of RACF. From available evidence it is not clear if benefits of in-hospital emergency care outweigh potential adverse complications of transfer. Future research is needed to better understand patient-centred outcomes of transfer and explore alternative models of emergency healthcare.

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**Predictors of Difficult Tracheal Intubation Patients in the Emergency Department**

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**Background and Objectives:** Airway assessment before tracheal intubation is very important for emergency physicians, because if difficult airway is expected, we should intubate patients more carefully and early consult experts for assist. The aim of this study is to evaluate the incidence and predictors of the difficult intubation patients at the emergency department. **Methods:** This was a 17-month prospective observational study, which was approved by the institutional review board of Mackay Memorial Hospital (11MMHISO46). Difficult tracheal intubation was defined as failure of first attempt of intubation. We included 110 tracheal intubation patients, who visited the emergency department of Mackay Memory Hospital and joined the study by themselves or delegates during 2011/11-1/2013/3/31. **Results:** The incidence of difficult intubation patients in the study was 35.5%. Comparing with non-difficult airway group, the difficult airway group correlated well to increased BMI, double chin but not sunken cheeks, thick short neck, lesser inter-incisors distance and thyromental distance, and much sputum impaction. However, other factors like age, gender, difficult mask bagging, causes of intubation, reeding mandible, snoring, lack of teeth, sternomental distance, thyroternal distance, poor neck mobility and intubation injury are not statistically significant. The multivariate odds ratio (OR) for difficult intubation, for every 1-point increase in the BMI, the chance of difficult intubation increased by 21.4% (OR 1.214, 95% confidence interval CI), 1.05 to 1.404, p = 0.009; for every 1-cm increase thyromental distance, the chance of difficult intubation decreased by 38.4% (OR 0.614, 95% CI, 0.401 to 0.941); The patient with upper airway obstruction 5.16 times difficult intubation compared with non-upper airway obstruction (OR 5.163, 95% CI, 1.066 to 24.996). **Conclusions:** The difficult intubation patients were associated with increased BMI, lesser inter-incisors distance and upper airway impaction in this study. We should manage these patients carefully and early consult experts if necessary.

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**Association Between Intubation Time and Success Rate Using Video Laryngoscope**

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**Background and Objectives:** It is known that use of video laryngoscope including C-MAC video laryngoscope (C-MAC) has a shorter endotracheal intubation (ETI) time compared to direct laryngoscope. However, whether there is an association between ETI time and success rate, remains unknown. To identify the relationship, cut off time for successful ETI and factors affecting the ETI time. **Methods:** This is a retrospective observational cohort study in the Emergency Department (ED). We used C-MAC video laryngoscope with functions to record time and image during ETI procedures. During the 17 month study period (February 2016 to July 2017), we enrolled patients: (i) older than 18 years; (ii) who underwent ETI with C-MAC. ETI time was defined as the time elapsed from the moment the tip of the C-MAC blade passed an incisor tooth to the time the endotracheal tube passed the vocal cords. The following variables were collected for this study: age, sex, indication for ETI, the risk factors of intubation. The data were analyzed using the Mann-Whitney U test, the receiver operating characteristic (ROC) analysis and the multivariate logistic regression analysis. **Results:** Of the 311 patients who underwent ETI, 231 patients were intubated with C-MAC. We recorded complete data from 92 patients. When we sought the cutoff time for successful ETI, the area under the ROC curve (AUC) was 0.70 and the cutoff value was found to be 61 seconds with 78.2% sensitivity and 57.1% specificity. In the successful group, The direct Cormack classification and Mallampatti classification is significant differences with ETI time. (Cormack p = 0.002, Mallampatti p = 0.038). The video Cormack classification is clearly associated with ETI time (p = 0.08). **Conclusions:** The intubation time is expected to be longer because of the difficulty in securing the viewing field, it is necessary to consider change of the operator or the device at an early stage.

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**LeHeR, a Simple Novel Approach For Difficult Airway in Non Trauma Patients: a Case Series**

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**Background and Objectives:** The difficult airway is encountered in 6-11% of patients undergoing endotracheal intubation. The snifing position, external laryngeal manipulation and head elevation have been used to facilitate laryngoscopy. We
have encountered a novel method of improving laryngoscopic view. Methods: The LeHeR (left head rotation) in Supine position technique was performed on 5 patients with difficulty to bag-valve-mask ventilation and Cormack-Lehane 3 and 4 during laryngoscopy. Results: Case 1: A 3 year-old-boy with gross hydrocephalus in respiratory distress due to aspiration pneumonia had an oxygen saturation of 80% despite being on high flow oxygen. Due to his large occiput, his neck was flexed and his Cormack-Lehane was 3b despite external laryngeal manipulation and ramp. LeHeR was applied and improvement of bag-valve-mask ventilation followed by improved laryngoscopy view to grade 1 was achieved. Case 2: A 9-month-old girl, with status epilepticus (45 minutes down time) secondary to meningitis, cyanouted. Intubation was hindered by a floppy epiglottis and patient desaturated to 57% with bag-valve-mask ventilation. LeHeR was applied and her oxygen saturation increased and she was successfully intubated. Case 3: A 57-year-old obese man with cardiac arrest. There was difficulty in achieving adequate bag-valve-mask ventilation despite the use of oropharyngeal airway. LeHeR was applied and the patient was successfully ventilated via the same setup. Case 4: A 25-year-old man had cardiac arrest. Laryngoscopy during CPR showed a Cormack-Lehane 3b. LeHeR improved the view to grade 1 and intubation was performed successfully. Case 5: A 6-year-old boy, drowned for almost 30 minutes in cardiac arrest. Abdomen was distended with water and there were difficulties in getting the appropriate-sized oropharyngeal airway. LeHeR method opened up his airway and patient was successfully intubated. Conclusions: The LeHeR technique is a simple manoeuvre to improve drastically the laryngoscopic view for Cormack-Lehane 3b and 4 in 1 and 2

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A Newfangled Approach in Emergency Medicine-Awake Flexible Scope Intubation

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Background and Objectives: Generality incognizant of “flexible fiber-optic intubation” which has been a decrepit appellation as newer bronchoscopes no longer use fiber-optic technology. “Flexible scope intubation” (FSI) is the desirable dub for technique currently and “flexible intubating scope” (FIS) for the device. In fact, FSI is better couthenanced than conventional laryngoscopic intubation in an awake patient. The objective of this study is to peruse FSI as a pragmatic dexterity in acute settings. Methods: This is a descriptive retrospective observational case study performed as part of routine clinical practice in an Emergency Department of a tertiary center. We exultantly described nine acute cases of successful FSI in onerous airways. Results: Case I: 33 years old morbid obesity male with Pickwickian syndrome. Case II: 39 years old male with severe head and maxillofacial injuries. Case III: 19 years old male with severe head and lung injuries. Case IV: 32 years old male with severe head and lung injuries. Case V: 58 years old male with severe head injury. Case VI: 25 years old male in diabetic ketoacidosis with severe decompensated metabolic acidosis. Case VII: 29 years old female in diabetic ketoacidosis. Case VIII: 34 years old male in septic shock and multi-organ failure. Case IX: 43 years old female in severe sepsis and Type II respiratory failure. Conclusions: We inferred that FSI is a facile method in an awake patient as a loss of pharyngeal muscle tone occurs in deaened state, leads to upper airway collapse and limits fiber-optic visualization. FSI is also an avaliable method in arduous difficult airways clinical settings with impediments to direct laryngoscopy such as limited mouth opening, abnormal airway anatomy obstructing direct visualization of the vocal cords, unstable cervical spine, airway trauma and in prone or lateral positions requiring rescue intubation.

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Nasal High Flow Oxygen vs. Conventional Oxygen Therapy For Do-Not-Intubate Patients: A Randomised Crossover Study

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Background and Objectives: Nasal high flow (NHF) has been shown to be an effective oxygen delivering method in patients with hypoxic respiratory failure of various aetiologies, but it has not been investigated in patients with do-not-intubate (DNI) status in the emergency department (ED) setting. We aimed to compare the effectiveness of NHF to COT in improving the subjective comfort of DNI patients with hypoxic respiratory distress in the ED. Methods: This randomised, non-blinded, crossover study was conducted in 48 patients in the ED of Siriraj Hospital, Bangkok, Thailand (TCTR 20171107001). Patients age ≥18 years with DNI status presented with hypoxic respiratory distress were included. There were randomly allocated to receive either plan A; conventional oxygen therapy (COT) for 60 minutes followed by NHF for 60 minutes (n = 24) or plan B; 60 minutes of NHF followed by 60 minutes of COT (n = 24). Forty-one participants completed the study protocol; 19 in plan A and 22 in plan B. Primary outcomes were modified Borg scale (MBS) and numeric rating scale (NRS) post-intervention. Per-protocol analysis was performed. Results: Baseline MBS scores were 7.2 ± 2.1 (plan A) and 8.2 ± 1.8 (plan B). At 120 minutes, MBS in patients who received COT and NHF were 4.05 ± 2.3 and 2.32 ± 1.7, respectively (p = 0.001). Lower MBS was also found at 60 minutes after the first NHF intervention had completed. Results of NRS were similar to that of MBS. There were no serious complications of NHF. Conclusions: In DNI patients with hypoxic respiratory distress, oxygen therapy given via NHF in the ED may decrease the severity of dyspnoea during the first hours of treatment.

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The Predicted Difficult Airways in the Emergency Department: Incidence, Management and Outcomes

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Background and Objectives: Emergency physicians must be competent in intubating patients with difficult airways. However, data are scarce about difficult airways in the emergency department. This study aims to explore the incidence, management and outcomes of patients with the predicted difficult airways in the emergency department. Methods: We conducted a retrospective cohort using a prospective registry that collected intubation data from November 2017 to October 2018 in an academic emergency department in a tertiary care hospital. The records with complete difficult airway assessment were included. Two categories of predicted difficult airways were analyzed: predicted difficult intubation by direct laryngoscopy and predicted difficult bag-mask ventilation. The former consisted of difficult external appearance, the “3-3-2” evaluation, Mallampati score, obstruction or obesity, and limited neck mobility. The latter consisted of difficult mask seal, obstruction or obesity, the absence of teeth, and reduced pulmonary compliance. Results: During the study period, there were 223 records that met the inclusion criteria. The predicted difficult airways were present in 39.5%; 25.6% were predicted of difficult laryngoscopy and 34.5% were predicted of difficult bag-mask ventilation. In patients with predicted difficult airways, both sedation and neuromuscular blocking agents were used in 48.9%, sedation only was used in 46.6%, and no medications were used in 4.5%. Intubations were achieved using direct laryngoscopy for 86.4% and videolaryngoscopy for 13.6%. The first-pass success was accomplished in 73.9%. When compared with patients without indicators of difficult airways, the patients with predicted difficult airways were less likely to receive both sedation and neuromuscular blocking agents (OR 0.49; 95% CI 0.29-0.86; p = 0.01). There was no significant difference between the two groups regarding the glottic views, first-pass success, or complications. Conclusions: The predicted difficult airways were associated with sedation methods emergency physicians chose in emergency intubations but were not associated with glottic views, first-pass success, or complications.

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Non-Conveyance of Prehospital Emergency Patients in Helsinki EMS System

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Methods: The predicted difficult airways were analyzed as a part of routine clinical practice in an Emergency Department of a tertiary center. We exultantly described nine acute cases of successful FSI in onerous airways. Results: Case I: 33 years old morbid obesity male with Pickwickian syndrome. Case II: 39 years old male with severe head and maxillofacial and Grade II liver injuries. Case III: 19 years old male with severe head and maxillofacial injuries. Case IV: 32 years old male with severe head and lung injuries. Case V: 58 years old male with severe head injury. Case VI: 25 years old male in diabetic ketoacidosis with severe decompensated metabolic acidosis. Case VII: 29 years old female in diabetic ketoacidosis. Case VIII: 34 years old male in septic shock and multi-organ failure. Case IX: 43 years old female in severe sepsis and Type II respiratory failure. Conclusions: We inferred that FSI is a facile method in an awake patient as a loss of pharyngeal muscle tone occurs in deaened state, leads to upper airway collapse and limits fiber-optic visualization. FSI is also an avaliable method in arduous difficult airways clinical settings with impediments to direct laryngoscopy such as limited mouth opening, abnormal airway anatomy obstructing direct visualization of the vocal cords, unstable cervical spine, airway trauma and in prone or lateral positions requiring rescue intubation.

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Background and Objectives: A rise in the number of calls for Emergency Medical services (EMS) has been seen universally during the past decades. This will require the utilization of available resources to their full extent and a significant increase in EMS funding. It has been evaluated that 11-61% of patient conveyance by ambulance happens without a clear medical justification. Therefore, the reduction of unnecessary patient conveyance is seen as a potential way to prevent costs from increasing disproportionately. The aim of this study was to examine the profile of EMS calls in which patients were not conveyed with an ambulance.

Methods: Helsinki has a population of 620,000. All emergency phone calls in Helsinki area are handled by a single dispatching center. All urgent EMS calls are provided by the Helsinki City Rescue Department and non-urgent calls by one private company both using a uniform electronic patient reporting system. We examined all EMS calls between 2013-2017 in which the patient was not transported by an ambulance. We excluded EMS calls in which patient was never found or died on scene thus transportation could not be considered. Results: A total of 105,527 EMS calls ended in non-conveyance i.e. approximately 32.1% of all EMS calls. A total of 91,786 calls fulfilled the inclusion criteria. In 7,608 cases (8.3%) the reason for non-conveyance was patient’s refusal of transport against medical advice. An EMS physician was consulted in 11,403 cases (13.0%). Conclusions: Non-conveyance is standard practice in Helsinki EMS, and most decisions of non-conveyance are made by EMS paramedics on scene, without consulting a physician.

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Prediction of ROSC in Pan-Asian Out-of-Hospital Cardiac Arrest Patients

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Background and Objectives: Survival is the most consistently captured outcome across countries, while return of spontaneous circulation (ROSC) represents the earliest endpoint reflecting the ‘unbiased’ initial resuscitation success. In this study, we aimed to develop and validate a statistical model to predict ROSC for out-of-hospital cardiac arrests (OHCA) patients in Pan-Asian population.

Methods: This was a secondary analysis of a prospective, international, multicenter cohort study, the Pan-Asian Resuscitation Outcomes Study (PAROS). Data were collected from January 2009 to December 2012. The endpoint of this secondary analysis was ROSC. Patients without outcomes, whose arrests caused by trauma, who were not transported by emergency medical services, and children< 18 year old were excluded from the analysis. Multivariate logistic regression was used for predictive model development and receiver operating characteristic (ROC) analysis was conducted in evaluating model performance. Results: 50,183 patients were included in the analysis, among which 3,847 had met the endpoint, i.e. ROSC. The following independent variables were found significantly associated with ROSC: Age, emergency medical services (EMS) response time, arrest witnessed, bystander cardiopulmonary resuscitation (CPR), first arrest rhythm, prehospital defibrillation, prehospital advanced airway, and prehospital drug administered. The multivariate model built on the above predictors achieved an area under the curve (AUC) of 0.82, suggesting good prognostic value of using routinely collected variables to predict ROSC. Conclusions: After external validations, this simple predictive tool has the potential to help discover the impacts of different resuscitation strategies and post-resuscitation interventions, which will eventually improve the outcomes of OHCA patients.

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Validity of the Japanese Prehospital 5-Level Triage in Adults: a Cohort Study

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Background and Objectives: Triage in the prehospital setting is essential to a quick assessment of emergency patients. There is an increase use of emergency medical services (EMS) by the elderly due to the ageing of the society. It has thus become necessary to create a system that allows the triage and transfer of patients with high priority. The Fire and Disaster Management Agency in Japan established a multi-tier triage system for OHCA was associated with increased prehospital defibrillation and improved outcomes.

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Predicting Good Neurological Recovery in the Initial OHCA Survivors with Machine Learning

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Background and Objectives: A multi-tiered response (MTR) system has been a controversial issue for cost-effectiveness or outcome improvement after out-of-hospital cardiac arrest (OHCA). This study aimed to investigate the effect of the MTR on OHCA outcomes. Methods: A natural experimental study was conducted for resuscitation-attempted adult OHCA. The MTR system was implemented in Korea by the National Fire Agency in 2015 across the whole country. The MTR program had three components, 1) detection of OHCA by dispatcher, 2) dispatch of ambulance or fire engine in addition to routine dispatch of ambulance, 3) performance of team CPR. The study period of 2015-2016 was divided by 6 months (phase I, phase II, and phase III). After external validations, this multi-tier response system for OHCA was associated with increased prehospital defibrillation and improved outcomes.

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Identifying Potentially Avoidable Emergency Department Visits of Long-term Care Hospital Residents in Korea: a Multi-center Retrospective Cohort Study

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Background and Objectives: The study aimed to estimate the rate of potentially avoidable transfers from long-term care hospitals (LTCHs) to emergency departments (EDs) of university hospitals in Korea and to categorize the causes of these transfers. Methods: This retrospective multicenter study included patients aged 65 years and older who were transferred from LTCHs to 5 EDs of university hospitals. The primary outcome was the number of avoidable transfers. To develop the available tools that identify avoidable transfers, we (1) developed a conceptual framework, (2) developed the criteria of potentially avoidable transfers, (3) recruited and trained expert panels who then performed chart reviews, and (4) analyzed the appropriateness of transfers. The secondary outcome was the number of patients who have already signed, while still in LTCHs, the informed consent for transferring (XGBoost), support vector machine, random forest, elastic net, and neural network) using community, patients, emergency medical service (EMS) and hospital variables which could be obtained within 24 hours of ED visit. The area under the receiver area operation curve (AUROC) was calculated to assess discrimination. Calibration was assessed by Hosmer-Lemeshow test, and reclassification was assessed by continuous net reclassification index (NRI). Results: A total of 19,860 patients were included. Of the 15,888 patients in the training group, 2,228 (14.0%) had good neurological recovery, and of the 3,972 patients in the validation group, 577 (14.5%) had good neurological recovery. Logistic regression, XGBoost and elastic net models were well-calibrated with the highest discrimination power (AUROC: 95% CI: 0.949 (0.941-0.957), 0.949 (0.941-0.957), 0.949 (0.941-0.957)) for logistic regression, XGBoost, and Elastic net, respectively. Hosmer-Lemeshow test: all p value >0.05. XGBoost reclassifies patients according to their true risk better than logistic regression did (NRI: 0.110), but elastic net reclassified worse than logistic regression did (NRI: -1.239). Conclusions: The best performing machine learning algorithm was a XGBoost for prediction of good neurological recovery in LTCHs patients. Future prospective validation is warranted.

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The Same and Different Hospital Revisits of Emergency Department: a Nation-Wide Database Analysis From Taiwan

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Background and Objectives: Emergency department (ED) revisit rate has been accepted as a quality indicator worldwide. Nevertheless, most of the revisit rates are based on data collected from the same hospital. This study sought to explore the variations in 72-hour ED revisits to the same or a different hospital. Methods: ED revisits within 72 hours after an index ED encounter were analyzed using Taiwan’s National Health Insurance Research Database that contained one-third patient records from 2011 to 2013. The rates of the same hospital revisit (SHRV) and different hospital revisit (DHRV) were calculated and compared among distinct levels of hospital accreditation. Linear regression analyses were used to measure the correlation between revisit rates and average monthly volumes of the index ED visits in each hospital. Patient demographics were extracted and multilevel logistic analyses were performed to evaluate predictors of DHRV. Results: There were 5,997,180 ED visits, and 350,692 (Total revisit rate 5.85%, 95% CI 5.83 to 5.87) were associated with 72-hour ED revisits. Of them, 134,288 (38.3%, 95% CI 38.1 to 38.5) revisits occurred at different institutions. There were significant differences in rates of SHRV and DHRV across different hospital levels. The rates of DHRV had significant inverse correlation with the average monthly volume of the index ED visits (r=-0.34, p<0.0001). The independent predictors associated with the increased odds of DHRV were: younger age, female, triage level 1 or 2, initial diagnoses of circulatory or injuries, initial ED visits during daytime or nighttime, on weekend or holiday, and the initial visited hospital level being a local hospital. Conclusions: SHRV rate alone could underestimate the true revisit rate. The rates of DHRV differed across levels of hospital accreditation, and had significant inverse correlation with the ED volume. Both rates of SHRV and DHRV should be taken into consideration when benchmarking hospital performance.

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Rural Emergency Medicine in Guatemala: What Is the Disease Burden?

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Background and Objectives: Each year, multiple volunteer teams from North America travel to Central America to provide health care during short term trips. Academic organizations and the WHO lack data to answer the question, “What is the burden of acute disease?” There is no documentation of presenting complaints, vital signs, physical findings, or diagnoses in rural areas of Central America. Record data on patients arriving at a rural Guatemalan ED to evaluate the disease presenting for treatment. Methods: A cross-sectional analysis was performed over three years, including 4 separate medical trips each lasting 4 days, in a non-urban Guatemalan ED. Chief complaint, gender, age, weight, traumatic injuries, past medical history, vital signs, x-rays, laboratory testing, bedside ultrasound, need for transfer, final diagnosis, and prescriptions were recorded. Results: A total of 556 patients were seen. The complaints included: abdominal pain in 195 (35%), extremity pain in 133 (24%), GU/GYN in 89 (16%), neurologic in 72 (13%), respiratory in 39 (7%), and dermatologic in 25 (5%). Some patients had more than one complaint. 339 (61%) patients were female and the average age was 38, with a range from 2 months to 87 years. 62 (11%) patients were diagnosed with URI and received outpatient antibiotics. Only 23 (4%) traumatic injuries were recorded. 63 (11%) bedside ultrasounds were performed, 6 intrauterine pregnancies were identified by ultrasound, and 1 renal artery aneurysm and 1 liver mass. 32 (6%) patients were diagnosed with GI infections by stool testing, either H pylori or Entamoeba. 5 (1%) patients required emergent transfer to an advanced facility. Conclusions: The majority were women, though the most critical patients were children: 1 fracture and 2 with sepsis. Infections requiring antibiotics continued to be a significant burden of disease in rural Guatemala presenting to the ED. Bedside ultrasound was introduced and well-received by 2018 it was perceived as necessary by patients and the local physicians.

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A New Suggestive Prognostication Model Following Out of Hospital Cardiac Arrest: Systematic Review of Bispectral Index, Infrared Pupillometry and Near Infrared Spectroscopy

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Background and Objectives: Out of hospital cardiac arrest (OHCA) is associated with high mortality. The patients who are resuscitated, about 50% die or have a poor neurological prognosis. Advanced resuscitative and post resuscitation care comes with a significant financial cost. Additionally, the emotional impact on family and patients quality of life due to poor neurological outcome cannot be quantified. It is therefore essential to have a robust prognostication model which should aid the clinicians in decision making. The current delayed (72 hours) multimodal prognostication model is based on a very low level of evidence, therefore it is essential to increases its specificity by adding quantitative tools like bispectral index (BIS), infrared pupillometry (IRP) and near infrared spectroscopy (NIRS).

Methods: We performed a systematic review on use of BIS, IRP and NIRS in prognostication following OHCA. The reviews are registered with PROSPERO. Electronic databases were searched using keywords for randomised control trials, prospective and retrospective studies. Reviewers screened, selected and performed analysis using PRISMA method. The selected studies were analysed using the GRADE system. Meta-analysis was performed if suitable. Results: Our initial analysis derived mostly non randomised trials in each group, with a significant heterogeneity to perform meta-analysis. An initial, prolonged and bilateral BIS value of 0 within 48 hours had very high specificity (100%) and low false positive rate (10%) to predict poor outcome. A superior combined or initial NIRS value (SMD 2.12, CI 1.14 to 3.10, p < 0.00001) predicted good neurological outcome. Prolonged failure to obtain NIRS >50% saturation should be included in multimodal decision to stop resuscitation. A low quantitative pupillary light reflex using ILR in the initial hours following resuscitation was associated with poor outcomes. Conclusions: We suggest a new prognostication model using these quantitative tools during various stages of resuscitation care. The new tool will predict poor neurological outcome with higher specificity.

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Is Point-of-care Ultrasound a Reliable Predictor of Outcome During Atraumatic, Non-shockable Cardiac Arrest?

A Systematic Review and Meta-analysis

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Background and Objectives: Point-of-Care Ultrasound (PoCUS) is increasingly utilized during cardiac arrests (CA). The purpose of this study is to evaluate the accuracy of PoCUS in predicting return of spontaneous circulation (ROSC), survival to hospital admission (SHA), and survival to hospital discharge (SHD) in adult cardiac arrests (CA) on PoCUS, presence of CA had diagnostic odd ratios (DOR) for ROSC, SHA and SHD of 15.9 (5.9-42.5), 9.8 (4.9-19.4) and 5.7 (2.1-15.6), respectively. The CA on PoCUS, presence of CA had diagnostic odd ratios (DOR) for ROSC, SHA and SHD respectively. Compared to absence of CA, 74.7% (58.3%–86.2%) and 69.4% (45.5%–86.0%) and a poor neurological outcome with higher specificity.

Conclusions: The presence of CA on PoCUS was associated with improved odds for ROSC, SHA, and SHD. We found greater heterogeneity between the studies and a lower sensitivity and higher negative likelihood ratio compared to previous reviews. While PoCUS may provide valuable information in the management of non-traumatic PEA or asystole, it should not be viewed as the sole predictor of either successful or unsuccessful resuscitation in these patients.

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Quality of Bystander CPR by Lay First Responders: Training vs. Real-World Use of a Novel CPR Feedback Device in Singapore

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Background and Objectives: Quality of chest compressions is positively associated with an increased chance of survival from cardiac arrest. Our objective is to gain insights by comparing the quality of chest compression performances in real-life emergencies to training performances. Compression quality data were derived from the use of a novel CPR feedback device during training and then later in actual cardiac arrest cases in Singapore. Methods: The credit-card sized “CPRcard” device provided visual indication of chest compression depth and rate in real-time, and stored the data. Median rate, depth; proportion within targets (100-120/minute; depth: 4-6 cm); and flow-time were used to determined compression quality. Bystanders’ emergency performances were compared to their training performances.

Results: Median depth during emergencies vs. trainings was 39 mm (95% CI: 30-49 mm, p = 0.028) vs. 55 mm (95% CI: 50-57 mm, p = 0.028), and median rates were 114 cpm (95% CI: 109-120 cpm, p = 0.104) vs. 109 cpm (95% CI: 105-112 cpm, p = 0.104). Of total emergency vs. training delivered compressions, 6% (95% CI: 0.4%; p = 0.008) vs. 63% (95% CI: 56-90%; p = 0.008) were within target depth; 54% (95% CI: 32-79%; p = 0.028) vs. 94% (95% CI: 81-97%; p = 0.028) were within target rate. Of the lay bystanders’ during emergencies vs. trainings, 2 (25%, p = 0.072) vs. 5 (71%, p = 0.072) met both compression and depth targets. Emergency vs. training compression flow-time was 95% (95% CI: 85-99%; p = 0.099) vs. 100% (95% CI: 96-100%, p = 0.099), respectively. Lay bystanders overall reported positive experience using the card but some expressed reluctance to compress deeply for fear of harming the victims. Conclusions: Training compressions were of better quality. The results show the quality of chest compressions delivered by lay bystanders in actual cases, and highlights depth as an area of concern that could improve with training enhancement.

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Prognostic Value of P25/30 in Somatosensory Evoked Potential After Cardiac Arrest

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Background and Objectives: The P25/30 somatosensory evoked potential (SEP) is a positive deflection following N20 with latency of 25-35 msec. According to our pilot study, N20 without following P25/30 is related with poor outcome. In this observational study, we will identify whether the presence of P25/30 checked on 24 and 72 hours after ROSC, Abnormal N20 was defined as amplitude lower than 0.1 μV. Abnormal P25/30 were identified according to the ratio between P25/30 and N20 (PNR) and the amplitude. Definition of abnormal PNR was less than 0.5. The cutoff value of abnormal P25/30 amplitude was identified by ROC analysis. Poor outcome was defined as cerebral performance cerebral score less than three on hospital discharge. Thereafter, AUC of the P25/30 predicting poor outcome was compared to the AUC of the N20 predicting poor outcome. We also compared the predictive value of amplitude between N20 and P25/30 (peak-to-peak amplitude) to the P25/30 and N20.

Results: 80 patients were included in the study. The cutoff value of abnormal P25/30 amplitude was 0.3 μV. AUC of the PNR-
based P25/30 (0.92), amplitude-based P25/30 (0.91), peak-to-peak amplitude (0.87) did not show significant differences (p > 0.05). However, AUC of the N20 was 0.8, which was significantly lesser than the PNR-based P25/30, amplitude-based P25/30, and peak-to-peak amplitude (p < 0.05). Especially, P25/30 showed higher sensitivity than the N20 in predicting poor outcome (84.3% vs. 60.8%). However, P25/30 recorded 24 hours after ROSC was not valuable. **Conclusions:** P25/30 recorded 72 hours after ROSC showed superior value in predicting poor outcome than the N20. Moreover, P25/30 showed higher sensitivity, that showed potential as a predictor of good outcome.

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**Knowledge, Attitude and Practice of Laypersons Learning Cardiopulmonary Resuscitation and Automated External Defibrillator with the Use of CPRcard**

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**Background and Objectives:** Local physicians created the Dispatcher-Assisted first Responder (DARE) training programme to equip laypersons with the skills to initiate CPR and use an AED on a cardiac arrest victim, and raise bystander intervention rates. This study aimed to determine the shift in knowledge, attitude and practice (KAP) in laypersons undergoing DARE training. **Methods:** This study was conducted in 6 constituencies of Singapore from 2015 to 2016. The training consisted of a 13-minute instructional video with supervised hands-on practice on training manikins. Chest compression data were collected using CPRcards to compare the quality of compression performances. A pre-training survey assessed participants’ knowledge and attitude towards CPR and AED prior to the training. A post-training survey was given immediately to measure any shift in KAP. **Results:** Survey responses and CPRcard records of 350 participants were analysed. Correct answers for each knowledge question increased significantly post-training vs. pre-training, from 12% (95% CI 8.4%-15.6%, p = 0.001) to 48.3% (95% CI 42.8%-53.8%, p = 0.001). Median attitude scores toward performing CPR and AED use improved from 3 to 4 (p = 0.001) post-training. Median flow time improved from 96.0% in the first round to 97.5% (p = 0.001) in the second round of CPR compressions. Females showed greater post-training increase in knowledge (p = 0.002), and attitude scores toward CPR (p = 0.017) and AED (p = 0.008). People under the age of 55 (p = 0.039) and those with higher education levels (p = 0.037) had an increased shift towards good attitude towards AED-use, post-training. Individuals with no prior CPR or AED training had post-training increase in knowledge and good attitude shifts towards CPR and AED-use (p = 0.001). Males (p < 0.05) and participants with higher education levels (p = 0.05) achieved better adequate compression depth and flow time. Individuals with higher BMI achieved better adequate depth (p = 0.004). **Conclusions:** The training programme resulted in positive shifts in KAP for CPR-AED use amongst laypersons.

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**Mechanical Ventilation During Cardiopulmonary Resuscitation—a Comparison Between Automated Volume Control Ventilation and New Designed Ventilation with an Impedance Threshold Function**

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**Background and Objectives:** The best way to ventilate the lungs during CPR remains unknown. Heart-lung interaction plays an important role in the blood-flow induction during cardiopulmonary resuscitation. Previous researches have shown that decreased intrathoracic pressure induced by impedance threshold value resulted in improved efficacy of cardiopulmonary resuscitation. In this study, we investigated the influence of a novel ventilator mode which designed to decrease intrathoracic pressure during decompression and traditional ventilation mode on pleural pressure, coronary perfusion pressure, cerebral blood flow, and return of spontaneous circulation in a pig model. **Methods:** 2 three-month-old female domestic pigs were under general anesthesia with endotracheal intubation. Arterial and central venous catheters were inserted, carotid artery blood flow and pleural pressure were recorded using transonic probe and esophageal balloon catheter. Ventricular fibrillation was induced and untreated for 6 min. Each animal was then received continuous compressions and 2 types of ventilation mode for 6min each (first V-AC with triggering turned-off then 6 min later switch to the newly designed CPRV mode that has the function of impedance threshold which tends to decrease the pleural pressure). **Results:** Coronary perfusion pressure, end-tidal carbon dioxide and carotid blood flow in the CPRV mode were higher than those achieved in AC mode group with significant differences. However, no difference was observed in arterial blood gas parameters after switch the ventilation mode. Pleural pressure was significantly lower in the CPRV mode. Furthermore, the pleural pressure gap between compression and decompression phase were much higher during CPRV mode compared to AC mode which may explain the increase of compression efficacy. **Conclusions:** Novel CPRV ventilation mode may increase the compression efficacy compared to traditional AC mode during CPR which may be explained by the increased variation of pleural pressure.

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**The Hypothermic to Ischemic Ratio as a Predictor of Outcome in Patients Undergoing 24 or 48 Hour Targeted Temperature Management: A sub-study of the TTTH4 Trial**

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**Background and Objectives:** Treatment with targeted temperature management may improve outcome after cardiac arrest but the optimal target, duration and patient population is unknown. The hypothermic to ischemic ratio (H/I-ratio) predicts short-term outcome in these patients, possibly facilitating more individualized treatment. We validated the H/I-ratio in a post-hoc analysis of a large randomized controlled trial. **Methods:** We calculated the ischemic time from cardiac arrest to return of spontaneous circulation (ROSC), and the hypothermic time from ROSC until the patient reached 37°C. The main outcome was six-month mortality. We compared continuous variables with the Mann-Whitney U test. A COX model was constructed to identify factors related to time to mortality. **Results:** Out of the 338 patients included 237 (70%) were alive at six months and 226 were in a good functional state (67%). The H/I-ratio was 155 (IQR 111-238) in the survivors and 114 (IQR 80-169) in the non-survivors (p < 0.001). The H/I-ratio was 158 (IQR 115-243) in patients with a good outcome compared to 111 (IQR 84-162) in those with a poor outcome (p < 0.001). In a Cox regression model, including age, gender, whether the arrest was witnessed or not, bystander CPR, shockable rhythm, time to ROSC, admission temperature, intervention group (24 vs 48 hours), time to target temperature, a logarithmic transformation of the H/I-ratio significantly predicted time to mortality (HR 0.39 95% CI 0.23-0.68, p = 0.001). In a model excluding patients that were rewarmed early the results were similar (HR 0.42, 95% CI 0.24-0.75, p = 0.003). However, in a model for good functional outcome at six months the H/I-ratio was not associated with outcome (OR 1.6 95% CI 0.67-3.859, p = 0.286). **Conclusions:** In this sub-study of a RCT on time-differentiated TTM, we found that a larger H/I-ratio was associated with mortality but not neurological outcome.

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**The Association of Between Time Intervals Regarding Adenosine Therapy and the Occurrence of Refractory Supraventricular Tachycardia**

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**Background and Objectives:** To investigate the association between time intervals regarding adenosine therapy and the occurrence of refractory supraventricular tachycardia (SVT), an episode of SVT that persists after 2 doses of adenosine therapy and the occurrence of refractory SVT (SVT), an episode of SVT that persists after 2 doses of adenosine therapy and the occurrence of refractory SVT. **Methods:** We reviewed 337 episodes of presumed SVT requiring adenosine therapy. Time intervals to each (first V-AC with triggering turned-off then 6 min later switch to the newly designed CPRV mode) were compared. **Results:** About 65% of interrupts were successful. However, interrupts were unsuccessful in 35% of cases due to prolonged duration of the SVT. **Conclusions:** There was no association between the occurrence of refractory SVT and the time intervals regarding adenosine therapy.

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**The The Association of Between Time Intervals Regarding Adenosine Therapy and the Occurrence of Refractory Supraventricular Tachycardia**

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The Utility of Focused Assessment with Sonography in Trauma in Pediatric Patients: a Meta-analysis
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Background and Objectives: Rapid diagnosis and intervention are cornerstone for pediatric trauma care. With the introduction of ultrasonography (US) into pediatric emergency medicine, Focused Assessment with Ultrasonography for Trauma (FAST) searching for intra-abdominal injuries (IAIs) has been used in pediatric trauma care. However, the studies evaluating the diagnostic accuracy of FAST in pediatric patients are scarce. The aim of this study was to evaluate the diagnostic accuracy of FAST examination for IAIs in pediatric trauma patients. Methods: A systematic literature review was performed using indexed in MEDLINE and EMBASE databases from inception to December 2017. Prospective studies that used a recognized reference standard for identifying intraabdominal trauma in pediatric patients, and the studies demonstrating the diagnostic accuracy including sensitivity and specificity of abdominal US for identifying intra-peritoneal fluid and/or IAIs were included. Retrospective studies and/or studies published in non-English languages were excluded. The design of this literature review follows the recommendations of the Preferred Reporting Items for Systematic Review and Meta-analysis (PRISMA) guideline.

Results: Fourteen studies with 1,763 enrolled patients were eligible for final analysis. With reference to the FAST examination for identifying intra-abdominal fluid, the pooled sensitivity and specificity were 74.5% (95% CI: 70.5%-78.5%) and 93.8% (95% CI: 92.5%-94.9%) respectively. For identifying IAIs, the pooled sensitivity and specificity of the FAST for detecting IAIs were 37.2% (95% CI: 32.2%-41.4%) and 94.4% (95% CI: 92.5%-96.0%). Conclusions: FAST demonstrated moderate sensitivity for detecting intra-abdominal fluid despite the high specificity. In contrast, for detecting IAIs, FAST showed low sensitivity. Therefore, for children with negative US results, alternative investigations such as contrast CT or contrast-enhanced US should be considered as long as IAIs are suspected from physical examination.

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Gray-to-white Matter Ratio Difference According to a Different CT Scanner For Outcome Prediction in Post Cardiac Arrest Patients with TTM
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Background and Objectives: Hounsfield Units (HU), the measurement of brain density on computed tomography (CT) image for calculating the gray-to-white matter ratio (GWR), can be changed by CT type or parameter. The authors demonstrated that GWR cannot revise this difference through investigation of the previous study about normal adult. Therefore, the purpose of this study is to prove this difference.

Methods: We analyzed 83 adult patients who had a post cardiac arrest. We divided the patients according to symptom-to-adenosine time (the sum of symptom-to-adenosine time and the occurrence of refractory SVT). We measured GWR on CT image and we compared GWR according to CT type, parameter of CT images and the occurrence of refractory SVT. We compared GWR according to symptom-to-adenosine time (the sum of symptom-to-adenosine time and the occurrence of refractory SVT). We used chi-square test, ANOVA test, and Mann-Whitney test for data analysis.

Results: Forty-eight patients were assigned to symptom-to-adenosine time group and thirty-five patients were assigned to symptom-to-adenosine time group. There was a significant difference of GWR according to symptom-to-adenosine time (99.8% vs. 97.5%, p=0.003). GWR decreased with increasing symptom-to-adenosine time. There was no significant difference of GWR according to CT type or parameter. Conclusions: GWR decreased with increasing symptom-to-adenosine time. Therefore, symptom-to-adenosine time can be a clinical predictor of GWR in patients who had post cardiac arrest.
Point-Of-Care Transcranial Sonography For Detection of Midline Shift in Neuro-Emergencies in the Emergency Department
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Background and Objectives: Midline shift (MLS) in brain is a life-threatening emergency, which requires immediate intervention following prompt diagnosis. Currently, CT Brain is accepted as the gold standard in detection of MLS. Frequent CT is not possible due to various factors like radiation exposure, transport difficulties, unavailability of bedside CT in most hospitals, and challenges in the micro-economics. This has led to a constant endeavour to identify and develop other methods for detection of MLS, among which Transcranial Sonography (TCS) is included. To validate point-of-care TCS for detection of MLS in neuro-emergency patients in the Emergency Department, and compare it to CT values of MLS.

Methods: This prospective double-blinded study was conducted from March 2018 to October 2018, in the Emergency Department of VIMS Hospital, Salem. All patients who required a CT Brain were included, and a TCS was performed. MLS on TCS was calculated by measuring the distance between the outer table of the skull and the third ventricle on both sides, through the temporal window using a 2.8 MHz Sector Probe. MLS on CT-difference between the ideal midline and the septum pellucidum. Results: A total of 99 patients were included in this study. The MLS (mean ± SD) was 0.203 cm ± 0.33 cm using TCS, and 0.201 cm ± 0.35 cm using CT. The Pearson’s and Spearman’s correlation co-efficient between CT and TCS was 0.976 and 0.962 respectively (p < 0.01). The area under the ROC curve for detection of a significant MLS using TCS was 83.7%. Using 0.5 cm as a cut-off (significant MLS), the sensitivity, specificity and positive likelihood ratio were 87.5%, 98.8% and 72.62 respectively. Conclusions: This study concludes that Transcranial Sonography could detect Midline Shift with a reasonable accuracy, and can be used as a point-of-care tool in the Emergency Department for detection of MLS.

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Cardiac A-Lines in Fast Scan as a Sign of Pneumopericardium
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Background and Objectives: Pneumopericardium is rare and usually results from blunt injury. Diagnosis through clinical and chest X-ray is often difficult. Ultrasound findings of A-line artifacts in the cardiac window may suggest pneumopericardium. Methods: A young man involved in a car accident and sustained blunt thoracic injuries, among others. As part of primary survey, FAST scan was performed. Subxiphoid view to look for evidence of pericardial effusion showed part of the cardiac image obscured by A-lines. Other cardiac windows showed only A-lines as well. A suspicion of pneumopericardium was raised and CT scan confirmed the diagnosis. Results: FAST scan is a standard ultrasound protocol and is used as an adjunct in primary survey according to ATLS guidelines. However, the purpose of FAST was to look for free fluid in pericardial and peritoneal region and of recent years, presence of haemo-and pneumothorax. With the advancement of knowledge in ultrasound, FAST protocol can be taken to another level. As in our case, partial visualisation of the cardiac image with presence of A-lines on subxiphoid view, coupled with A-lines on all other cardiac view is highly suggestive of pneumopericardium. Conclusions: Although FAST scan was originally used to look for presence of free fluid. With the knowledge of lung ultrasound for pneumothorax, our findings suggest that FAST scan can also be used to detect pneumopericardium.

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Diagnostic Accuracy of Point-of-care Lung Ultrasound among Patients Suspected of Having Pulmonary Tuberculosis
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Background and Objectives: Pulmonary Tuberculosis (PTB) is one of the leading causes of morbidity in the Philippines. Its prevalence rate is 438/100,000 population. The key to stopping the spread of the disease is accurate diagnosis and consistency of treatment and follow-up. Diagnosis is based on clinical findings and confirmation of infection by chest x-ray, sputum analysis and molecular testing. This standard work-up is hampered by its cost, the availability of diagnostic centers and the tediousness of testing especially in resource-limited areas. Recently, Lung ultrasound (LUS) has become a valuable modality in diagnosing pulmonary diseases because of its portability, accuracy and cost-effectiveness. PTB is one of the few diseases that have not been extensively studied with regards to sonographic diagnosis. It is our intention to determine the diagnostic accuracy of LUS in patients with suspected PTB, using chest radiography, sputum microscopy and nucleic acid amplification testing as the reference standard. Methods: We conducted a cross-sectional, prospective observational study of 131 consecutive patients with presumptive PTB in a tertiary hospital outpatient clinic. Lung ultrasound was performed on all subjects to detect findings suggestive of PTB namely subpleural nodules, pleural effusion, consolidation and C-lines. All subjects subsequently underwent chest radiography, sputum microscopy and nucleic acid amplification testing using Xpert MTB/Rif to confirm presence of TB infection. The sonographers were blinded to the results of the diagnostic work-up. Results: Out of 131 patients, 102 had positive LUS findings of PTB. LUS compared to standard work-up had a specificity of 92.59% (75.71% to 99.09%), sensitivity of 55.77% (45.70% to 65.50%) and accuracy of 63.36% (54.50% to 71.60%) at 95% CI. Furthermore, it had a positive predictive value of 96.67% and a negative predictive value of 25.21%. Conclusions: Our study demonstrated that LUS has robust specificity and can potentially be an acceptable and simplified diagnostic test to detect PTB infection.

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How Do We Avoid the Overlooked Findings on ER Physician Ordered CT
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Background and Objectives: The radiologists usually write the radiological reports within 24 hours in Japan. Emergency physicians sometimes encounter incidental findings in computed tomography (CT) images. Such lesions, which have no relationship to the symptoms but pointed out by the radiologists under scrutiny, are occasionally overlooked. To prevent oversights of treatable diseases, we introduced a new system in which emergency physicians routinely check all the reports on the next day even if the patients already leave our hospital. The purpose of this study was to describe the outcomes of this system. Methods: The system started in April 2017. We conducted a retrospective chart review of patients who attended our emergency room between April 1st, 2017 and March 31st, 2018. We reviewed the patients’ medical records and their radiological reports on CT imag-
es which were ordered by emergency physicians. Results: In ER, 9,992 CT scans were ordered in this period. Of them, 236 cases required a re-contact with the patients because of the overlooked CT findings. Median age was 72 and 53.3% was male. Most common findings were cancer and/or cancer suspected. Conclusions: Our new system could effectively prevent oversights of serious incidental CT findings among patients attending an emergency room. Such as system has an important implication in terms of patients’ safety.

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A Case Series on Isolated Lead AVR ST-Segment Elevation Clinical Significance and Outcome

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Background and Objectives: One of the least significant leads on a 12-lead electrocardiogram is the augmented right lead (aVR), as it is not as specific compared to the other leads. In this case series, the value of lead aVR, which is more often than not ignored, is highlighted. Three cases of aVR ST-segment elevation on 12-lead electrocardiogram are described, with the end outcome of demise of all three patients. Methods: A short review of previous studies, case reports, articles and guidelines from 2011-2016 was done. Available literature sorted out those that proved to be significant for the presented cases, and described them in conjunction with the aforementioned cases. Results: Based on the limited information, isolated aVR STEMI had a poorer prognosis that led to significant mortality and morbidity of patients. aVR ST-elevation pertains to an occlusion of the left coronary artery or a severe three-vessel disease in the presence of an Acute Coronary Syndrome. Guidelines from the American Heart Association/American College of Cardiology Foundation in 2013 recognized ST-elevation of lead aVR in isolation as a STEMI; hence, recommended that patients with this particular ECG finding should undergo reperfusion strategies to improve prognosis. Conclusions: The indispensability of isolated aVR ST-segment elevation on ECG should alert physicians, especially Emergency physicians, to the high probability of Acute Coronary Syndrome with a very poor prognosis. If this group of patients is not promptly managed, demise may ensue, with cardiogenic shock as the most probable cause. With this electrocardiogram finding, physicians must be quick to make clinical decisions to increase chances of survival of this group of patients.

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Amplitude Changes in Combinations of S1, Q3, T3, and R3 in Left Arm-V2 ECG Lead Misplacement

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Background and Objectives: Differences in amplitude and orientation of individual Q, R, S, and T waves in Left Arm and V2 (LA-V2) leads misplacement have previously been described. Typical features include a deep S wave in lead I, deep Q, inverted T and tall R waves in lead III. These findings appear to be pathognomonic for LA-V2 lead misplacement. It can easily be misinterpreted as pulmonary embolism. The aim of this study was to describe the range, magnitude and significance of difference of combination changes of S1/Q3/T3/R3 in LA-V2 lead misplacement in order to identify unique differences that can be utilised as descriptors of LA-V2 lead misplacement. Methods: Consecutive adult Emergency Department patients were recruited and ECGs performed sequentially, first with normal lead replacement, followed by LA-V2 misplacement. To reduce variation and error for all ECGs were performed by a single operator. ECG amplitudes were tabulated by one investigator and cross-checked independently by another. Statistical analysis was performed using Microsoft® Excel 2016. Results: In total 62 pairs of ECGs were collected. Eleven combinations were derived. Amplitudes ranged from 1.3 to 7.92 mm for normal lead placement and 1.49 to 25.59 mm for misplac ed leads ECGs. The largest differences in amplitudes were S1+R3, S1+Q3+R3 and S1+Q3+T3+R3 (15.39, 18.61, and 15.71 mm respectively), all statistically significant. In the remainder, smaller differences were observed but all were statistically significant. Conclusions: Amplitude differences in S1, Q3, T3, and R3 can be observed in LA-V2 limb misplacement. These differences were demonstrated individually and in all possible combinations. Further validation and research are needed to determine if threshold amplitudes for particular combinations can be detected and used as criteria to identify LA-V2 limb lead misplacement.

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Background and Objectives: Chest pain is a common reason for presenting to the emergency unit and subsequent admission to the hospital. The assessment of the patient must include consideration of life-threatening causes including acute coronary syndrome (ACS). A new algorithm was introduced to the UHW in January 2016, which combines the use of the HEART score and high sensitivity troponin assay to stratify patients into very low, low, moderate and high risk of ACS and allow early discharge from the Emergency Unit for suitable patients. Methods: After the launch of the new chest pain pathway, a prospective observational data collection was conducted for 1 month for all the patients with troponin request. The result was then analysed using Microsoft Excel and discussion among stakeholders was held to discuss the compliance and methods to improve the compliance. Results: An initial audit of 149 patients shows poor compliance rate of just 43%. These led to a quality improvement project by introducing chest pain red dot and chest pain sticker. The aims of these are to act as a visual act of chest pain alert and a reminder to use HEART score and appropriate interpretation of the new high sensitivity troponin. A repeated audit after the implementation of these shows of 162 patients, compliance rate improves to 69%. Another audit done 3 months later with 135 patients shows a similar compliance rate of 68%. Conclusions: Chest pain red dot and chest pain sticker, which act as a visual act and remind improve compliance rate of chest pain decision pathway.

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Fluoroquinolone Use and Serious Arrhythmias: a Nationwide Case-Crossover Study

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Background and Objectives: Although fluoroquinolones are generally well tolerated, experimental studies have demonstrated their association with life-threatening ventricular arrhythmias and even sudden cardiac death. Despite these findings, the clinical association between fluoroquinolones and serious arrhythmias remains controversial. Methods: We performed a case-crossover study, using a two million sample subset of the National Health Insurance Research Database (NHIRD), representative of the overall population of Taiwan. We compared the exposure to fluoroquinolone in a 30-day risk period immediately before the serious arrhythmia event with 5 consecutive 30-day control periods. Odds ratios and 95% Confidence Intervals (CIs) were estimated using conditional logistic regression analysis. Results: From a total of 2 million participants, 7,657 patients with serious arrhythmia were identified. Patients were generally older, male and with a low prevalence of comorbidities, with hypertension and diabetes as the two highest recorded comorbidities. Use of fluoroquinolones within the 30-day period before the event was significantly associated with increased risk for serious arrhythmia (Odds Ratio–OR: 3.03, 95% CI: 2.48, 3.71). The risk of fluoroquinolones was attenuated, but remains significant after adjustment for time-varying confounders (OR: 1.48, 95% CI: 1.18, 1.86). A consistent increase in risk of serious arrhythmia was observed for all the different time windows investigated (7 days, 14 days, 30 days, 60 days, and 90 days). Conclusions: Exposure to fluoroquinolone was substantially associated with serious arrhythmic events, independently of the temporal proximity of fluoroquinolone prescription. Thus, clinicians should consider alternative antibiotic regimens in patients with pre-existing cardiovascular co-pathologies.

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Electroencephalography in Monitoring Unconscious Survivors After Cardiac Arrest Treated with Targeted Temperature Management

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Background and Objectives: Unconscious survivors after cardiac arrest treated with targeted temperature management are considered at high risk for post-resuscitation neurological complications. Methods: A review of patients with cardiac arrest treated with targeted temperature management admitted to our ICU from January 2010 to December 2015 was performed. A total of 18 patients met the inclusion criteria. Results: Of these patients, 12 had post-resuscitation electroencephalographic (EEG) recordings obtained in the ICU. EEG findings were classified into four categories: 1. No activity, 2. Non-convulsive status, 3. <=1 Hz slow activity, and 4. No activity with intermittent >=1 Hz activity. Mean duration of EEG monitoring was 14 hours (range 5-72 hours). Conclusions: Electroencephalography findings were consistent with a poor outcome. Further prospective studies are needed to determine the role of EEG in monitoring unconscious survivors after cardiac arrest treated with targeted temperature management.

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Background and Objectives: Describe clinical characteristics and electroencephalo-gram (EEG) imaging in unconscious survivors after cardiac arrest treated with targeted temperature management (TTM) therapy. Assess the association between EEG imaging and survivor outcome. Methods: Prospective, observational study in 26 unconscious survivors (Glasgow Coma Scale (GCS) ≤ 8) after cardiac arrest at Emergency Department, Bach Mai Hospital from January 2017 to August 2017. Clinical evaluation was conducted at the time of hospital admission and EEG was recorded at 24 hours, 48 hours, and 72 hours after admission. EEG imag-ings were classified into two groups: malignant and benign (BN). The malign-ant group encompasses survivors whose EEG had at least one of the EEG forms: Suppression (S), Burst-Suppression (BS), and Generalized periodic discharges (GPD). The primary outcome was mortality in hospital, and neurological outcome was assessed by Glasgow Coma Scale at the time of discharge with good out-come was defined as GCS ≥ 14. Results: Mean age was 42.7 ± 13.6 years. Male, 76.9% (20/26). Malignant EEG imaging rate was 69.2% (18/26). Subclinical seizure rate was 15.4%. The mortality rate in malignant group was 61.1% (11/18), compared with 12.5% (1/8) in benign group. In malignant group, no survivors had good outcome in terms of neurological outcome, whereas 50% (4/8) of be-nign group had good outcome. EEG imaging group was associated with increased risk of mortality (OR = 11, p = 0.002), however, not associated with neurological outcome. Conclusions: Electroencephalography is the potential monitoring method in unconscious survivors after cardiac arrest treated with TTM.

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Risk-stratification of Older Adults Who Present to the Emergency Department with Syncope: the FAINT Score

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Background and Objectives: Syncope is a common reason for visit to the Emergen-cy Department (ED). Due to challenges in risk-stratification, there is a substantial amount of variability in clinical management. We sought to derive and internally validate a novel syncope risk-stratification tool to predict occurrence of serious cardiovascular outcomes at 30 days. Methods: We performed a prospective, observation-al study of older adults with syncope or presyncope for whom no serious diagnosis was found in the ED. We enrolled older adults (≥ 60 years) with unex-plained syncope or presyncope from 11 ED across the United States. Patients were excluded if their symptoms were thought to be due to intoxication, seizure, stroke, head trauma, or hypoglycemia. Demographic, clinical, and laboratory variables were collected on all patients. The primary outcome was rate of serious cardiovascular events at 30 days. Bayesian logistic regression with multiple imputation was used to derive a clinical risk score. Results: We enrolled 3,173 older adults with unexplained syncope from 2013 to 2016. Mean age was 73 years (SD: 9.0 years), 50.5% were female. Overall, the incidence of serious outcomes at 30 days was 5.45%. A combination of five clinical variables: 1) history of heart fail-ure, 2) history of cardiac arrhythmia, 3) abnormal electrocardiogram, 4) elevated N-terminal proBNP, and 5) elevated high-sensitivity Troponin T was able to accura-tely risk-stratify patients for serious adverse event at 30 days. This set of clinical variables comprises the FAINT Score, which demonstrated a sensitivity and specificity of 96.5% (95% CI: 92.6, 98.7%) and 22.2% (95% CI: 20.7, 23.7%), re-spectively, with a C-statistic of 0.70, (95% CI: 0.67, 0.74). Conclusions: Among older adults with syncope or presyncope, the FAINT Score was able to predict se-rious outcomes at 30 days. This tool, in concert with clinical gestalt, could help optimize resource utilization for this patient population.

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ST-Elevated Myocardial Infarction: Characteristics and Outcome of Thrombolysis in a Minor Specialist Hospital

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Background and Objectives: ST-Elevated Myocardial Infarction (STEMI) is a lead-ing cause of death in high or middle income countries. In the early 1960’s, prior to the era of cardiovascular intensive care units, in-hospital mortality was greater than 30%. Nowadays, in-hospital mortality is 6.5-7.5%. Treatment with thrombo-lytics or primary percutaneous coronary interventions (PCI) reduces the mortality rate of patients with STEMI presenting within 12 hours. This study was taken to study the characteristics and outcome of thrombolytic therapy in STEMI in a mi-nor specialist/non-PCI centre. Methods: This is a retrospective cohort study, where 72 patients with the diagnosis of STEMI who were admitted and thrombolysed in the Emergency Department, Labuan Hospital between Jan 2016-Oct 2018. The clinical characteristics and in-hospital mortality were measured. Data was ana-lyzed using SPSS software. Categorical data was represented in the form of frequen-cies and proportion. Chi-square test was used as test of significance for qualitative data. Continuous data was represented as mean and standard deviation. p-value of < 0.05 was considered as statistically significant. Results: From this study, males were more affected (93%). Smoking and hypertension were the most common risk factors. Majority (91.7%) were walk-in cases, and others were brought in via ambulance. Mean time for admission from onset of symptoms was 3.28 hours. Anterior wall infarction was most common type of myocardial infarc- tion. Majority (54.2%) were admitted in Killips I class. In-hospital mortality was seen in 7% of cases. Higher mortality were in female, Killip IV class and hyper-tensive patients. Conclusions: Smoking and hypertension were most important risk factors for STEMI in the study. In-hospital mortality was 7% and was comparable to Western countries.

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Patterns and Predictors of Left Ventricular Systolic Dysfunction After HANGING INJURY

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Background and Objectives: Cardiac dysfunction is one of uncommon pathologic change after hanging injury: However, characteristics and predictor have not been well studied. The aim of this study is to evaluate the pattern and associated factor of cardiac dysfunction after hanging injury. Methods: We enrolled 71 patients who underwent echocardiography, serum laboratory data, and EKG after hanging inju-ry. Echocardiography was performed less than 3 days after hanging injury and laboratory data was collected serially from hospital visit to 48 hours. Results: A total 26 patients (36.6%) had Left ventricular systolic dysfunction (LVSD), 18 pa-tients (36%) in Cardiac arrest (CA) groups and 8 patients (38%) in non-CA groups. There were significant differences in serum CK-MB, and troponin I between LVSD and non-LVSD patients, but no differences in mortality, outcome, EKG findings and other variables. The most common patterns of LVSD in CA patients were global hypokinesia (11, 61.1%), and takotsubo cardiomyopathy 5, 27.8%, other RWMA (2, 11.1%) whereas takotsubo cardiomyopathy (6, 75.0%) and global hypokinesia (2, 25.0%) in non-CA. In multivariate analysis, troponin I elevation was associated with LVSD (OR, 9.39, 95% CI, 1.59-64.22, p = 0.016). AUC of troponin I for prediction of LVSD were 0.750. Conclusions: Most com-mon pattern of LVSD after hanging injury were global hypokinesia in CA and takotsubo cardiomyopathy in non-CA. The elevation of troponin I may be useful to predict the hanging associated LVSD.

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Evaluation of Weight Estimation Accuracy and Validation of the Use of Mid-ARM Circumference to Estimate Actual Body Weight in Adults Presenting to the Emergency Department

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Background and Objectives: We aimed to evaluate the accuracy of visual estima-tion of actual body weight (ABW) by Emergency Department (ED) staff and validate the mid-arm circumference (MAC) weight estimation formula derived by Cattermole et al. (weight (kg) = [4×MAC(cm)]-50), in the ED. Methods: This prospective, observational, single-centre, cross-sectional validation study was completed in a tertiary centre ED. Visual and MAC formula weight estimates were obtained for ambulatory convenience-sampled medically stable and con-
senting adults (≥16 years old) triaged to the Ambulatory Care Unit or Minor Injuries Unit. Patients were weighed, their MAC measured, and 13 categories of attending ED staff were asked to visually estimate patient ABW. Percentage error and absolute percentage error (APE) were calculated for visual and MAC formula estimates and were used to assess the agreement of each with ABW. Results: 288 patients were enrolled and 266 (mean age 38.4±18.4 years, range 16-90 years; mean weight 81.1±19.6 kg, range 47.6-184.9 kg; 49.6% male) were analysed. ED staff tended to underestimate weight (median visual estimate percentage error was -5.1% [IQR -13.8 to 2.5]; median MAC percentage error was -1.0% [IQR -8.4 to 6.2]). Median ED staff APE was 9.2% (IQR 4.1 to 16.4) and median MAC formula APE was 7.9% (IQR 3.3 to 14.6). The median MAC formula APE was significantly smaller than the median APE for visual estimates (one-tailed Wilcoxon Signed-Rank test p=0.023). Bland-Altman analysis demonstrated a -5.0% bias (LOA -30.1% to 20.2%) for ED staff estimates, compared to a -0.7% bias (LOA, -23.8% to 22.4%) for the MAC formula. Conclusions: The MAC formula produces a clinically valid ABW estimate that is significantly more accurate than the visual estimate of ED staff for ambulatory patients. Results were very comparable to Catteau nel et al.’s derivation validation study. Further investigation into the MAC formula’s accuracy and validity in the supine resus patient is required.

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Topical Ketamine as a Local Anesthetic Agent in Reducing Venipuncture Pain: a Randomized Controlled Trial
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Background and Objectives: Optimal pain management is an important issue in all Emergency Departments (EDs) and according to the local resources and personnel experts, there are vast variety of protocols to reduce pain. EMLA containing 2.5% lidocaine and 2.5% prilocaine is a common topical cream that widely use as a local anesthetic agent. Many studies supported the safety and efficacy of EMLA in relieving pain from minor procedures such as venipuncture or dermato.

Methods: A prospective randomized double-blind clinical trial was conducted in two university teaching hospital from March 2016 to May 2017. Three hundred adult patients randomly assigned to three groups (EMLA, local ketamine, placebo) using a block randomization procedure with matched subjects in each block based on sex and age. The clinical trial registered number was IRCT 2018012903549N2. Visual analogue scale was used to assess the pain associated with the venipuncture. Results: Results showed that the median of duration to reach complete anesthesia was not significantly different between 1st and 2nd group (ketamine and EMLA groups) (p=0.419). The duration of achieving local numbness was not significantly different between 1st and 2nd groups, either (p=0.212). The pain associated with the venipuncture in 1st and 2nd group was significantly lower as compared to placebo group (1.72±0.44 and 1.66±0.51 vs. 3.16±1.2, p<0.001). Conclusions: This study showed that local cutaneous ketamine is as effective as EMLA in relieving pain during venipuncture.

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Development of Paper-Based C-Reactive Protein Diagnosis Device as Diagnostic Adjunct in Emergency Department
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Background and Objectives: The C-reactive protein (CRP) level in whole blood has been considered as an indicator of multiple diseases in different divisions of medicine. Measuring the CRP level through an inexpensive and easy approach—the development of a point-of-care device—has the potential to bring the unfair advantage for emergency medicine. Methods: We first designed the pattern with three channels (as the detection zones) and the central circle zone. We then created this specific pattern onto the commercial filter paper via the chemical inks through using the screen printing approach. The bovine serum albumin solution 0.4 wt% was used as the blocking reagent to inhibit the non-specific absorption of the detection zones. We then immobilized the agglutination reagent with the different concentrations onto the negative channel, sample channel, and the positive channel individually. The whole blood sample was diluted with PBS. Taking advantage of the agglutination behavior between the CRP protein and its antibody through paper chromatography, we could precisely evaluate the CRP level in whole blood via the length deviation (LD) between the sample channel and negative channel. Results: The purified CRP protein with the concentration of ranging from 1 to 8 mg/dL collected from the blood sample of patients visiting the emergency department with various diagnosis has been spiked into whole blood samples, in order to build the calibrate curve of our device. We analyzed the LD of each whole blood sample. The positive channel of our device was considered as the control for device stability (i.e., successful test or not). The linear relationship between the LD and the CRP level in whole blood (from 1 to 8 mg/dL with R<sup>2</sup>=0.25) was observed with different types of clinical applications, in particular for emergency medicine. Conclusions: Paper-based CRP point-of-care diagnosis device has the potential to be diagnostic adjunct in emergency department.

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Clinical Topic Review to Compare High-dose vs. Low-dose Nitrates in Management of Acute Cardiogenic Pulmonary Edema in Emergency Department
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Background and Objectives: Acute cardiogenic pulmonary edema is a common cardiac presentation to the Emergency Department (ED). Non-Invasive Ventilation (NIV) and vasodilators, especially nitrates, remain the mainstay of treatment. Lack of clear guidelines about the initial nitrate doses has created apprehension among the ED care provider to choose between a low-dose and high-dose regimen. The objective of this systematic review was to compare the safety and efficacy of high-dose nitrates with low-dose nitrates for the management of acute pulmonary edema. Methods: We searched the Cochrane Central Register of Controlled Trials (CENTRAL), MEDLINE, EMBASE, Cochrane review, Google scholar and the ACP clinical policies and guidelines, Bibliographies of the relevant articles were reviewed up to 31 May 2018. Language restriction was not imposed. Two reviewers independently performed data abstraction using the Cochrane Collaboration tool for assessing the risk of bias. Results: From 102 potentially relevant studies, 3 randomized controlled trials (RCTs) and 3 observational cohort studies published between 1998 and 2016, were included in this clinical topic review. Data from the three RCTs showed lower need for mechanical ventilation with high-dose nitrates group [2 RCTs, n=144; RR=0.28 (0.20 to 0.3), p<0.001] offered no mortality benefit [3 RCTs, n=213; RR=0.32 (0.10 to 1.06), p=0.06] when compared with low-dose nitrates strategy. Data from the observational studies also did not show any mortality benefit for high-dose over low-dose nitrates therapy [3 observational studies, n=4,069; p=0.02 and I²=74%]. All studies were found to have significant heterogeneity and a high-risk of bias. Conclusions: Low quality evidence suggests some benefit in adopting a strategy of high-dose nitrates in the management of acute cardiogenic pulmonary edema in reducing the need for mechanical ventilation compared to a low-dose strategy. However, no difference in mortality was found in this systematic review.

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Improved Mortality Outcomes in Ebola Virus Disease with Vitamin a Supplementation: an International Multisite Cohort Study
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Elevated SuPAR Predicts Development of Chronic Kidney Disorders in Acutely Admitted Medical Patients

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Background and Objectives: Acutely admitted medical patients are at risk of developing kidney disease, and identification of high risk patients may allow for early intervention and prevention. Our objective was to determine whether plasma soluble urokinase plasminogen activator receptor (suPAR) measured at hospital admission can predict future development of chronic kidney disorders. Methods: Acute medical patients were admitted to the emergency department, Hvidovre Hospital, from November 2013 to March 2017 and followed for disease development until June 2017, with median follow-up of 2 years (range 90-1,318 days). Chronic kidney disorder was defined by ICD-10 codes for chronic dialysis, chronic kidney disease (CKD), glomerular disease, tubulointerstitial disease, and renal death not otherwise specified. Association of suPAR (log2-transformed) with development of a chronic kidney disorder was determined by Cox regression adjusted for age, sex, CRP, and eGFR at index admission. Results: In total, 28,728 patients were admitted during the study. Patients with a prior history of kidney disease (n = 3,019) were excluded, resulting in a study population of 25,709 acute medical patients. During follow-up, 1,032 patients (4.0%) developed kidney disease: 868 patients (3.4%) developed a chronic kidney disorder, while 241 (0.9%) patients developed acute kidney injury or required acute dialysis. In multivariable Cox analysis, a doubling in suPAR at index admission was associated with a hazard ratio of 2.03 (95% CI: 1.94–2.11) for developing a chronic kidney disorder.

Conclusions: In acute medical patients without prior kidney disease, suPAR was associated with future development of a chronic kidney disorder. These findings highlight the prognostic value of suPAR in kidney disease and its potential to be used in combination with GFR and proteinuria to monitor and prevent the development of kidney disease.

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**PO_EMS_03_01**

Association Between Awareness Time Interval and Outcomes of Out-of-Hospital Cardiac Arrest

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Background and Objectives: This study aimed to determine the association between the time interval from awareness of OHCA to calling EMS service by layperson and outcomes in OHCA. **Methods:** EMS-treated, witnessed, and adult OHCA (≥ 15 years) with presumed cardiac etiology between 2013 and 2016 were analyzed, excluding patients with unknown time factors and outcomes. The main exposure was awareness time interval (ATI) from time interval from awareness of OHCA to calling EMS service. Patients were classified with four ATI groups; group 1 (0-119 seconds), group 2 (120-239 seconds), group 3 (240-359 seconds), and group 4 (360-seconds). The outcomes were cerebral performance category 1 or 2 (good CPC). Multivariable logistic regression analysis was performed to calculate adjusted - odds ratios (AORs) and 95% confidence intervals (CIs) for outcomes by one-minute delay of ATI and ATI group (reference=group 1). **Results:** A total of 30,291 OHCA (49.4% group 1, 14.4% group 2, 10.5% group 3, and 25.7% group 4) were finally analyzed. Good CPC were 7.2% for total OHCA, 9.1% for groups 1, 10.1% for groups 2, 24% for groups 3, 24% for group 4, respectively. AORs (95% CIs) by one-minute delay was 0.95 (0.94-0.97) for outcome. AORs (95% CIs) by group 1 for outcome were 1.02 (0.88-1.17) for group 2, 0.75 (0.62-0.91) for group 3 and 0.51 (0.42-0.61) for group 4, respectively. AORs (95% CIs) by group 1 for outcome were 2.24 (1.90-2.63) for group 2, 1.65 (1.32-2.06) for group 3 and 0.58 (0.45-0.75) for group 4 in Layperson-witnessed OHCA. 1.07 (0.88-1.14) for group 2, 0.65 (0.61-0.85) for group 3 and 0.34 (0.32-0.42) for group 4 in Family-witnessed OHCA, respectively. **Conclusions:** A longer ATI in witnessed adult OHCA was associated with poor neurological recovery. A one-minute delay in ATI was associated with a 5% decreased of good neurological recovery and the effect was significantly increased in Family-witnesed OHCA.

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**PO_EMS_03_02**

Place-Provider-Matrix and Outcomes of Out-of-hospital Cardiac Arrest: a Nationwide Observational Cross-Sectional Analysis

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Background and Objectives: Place-provider-matrix (PPM) for cardiopulmonary resuscitation (CPR) program is the combining method between place factor and provider factor. We hypothesized that different PPM groups would have different effect size on the time interval to initiation of CPR and defibrillation and eventually survival and neurologic outcome. This study aims to test the association between place-provider-matrix (PPM) of bystander CPR and outcomes in out-of-hospital cardiac arrest (OHCA). **Methods:** Adults OHCA with cardiac etiology from 2012 to 2016 in Korea were analyzed, excluding cases with unknown place, unknown type of bystander, and unknown outcomes. The PPM was categorized by place (public vs. home) and provider (dedicated for first responder, family, layperson). Outcomes were survival to discharge and good cerebral performance category (CPC) 1 or 2. Multivariable logistic regression analysis was performed to test the association between PPM and outcomes, adjusting for potential confounders to calculate adjusted odds ratios (AORs) and 95% confidence intervals (CIs). **Results:** A total of 74,893 patients were analyzed; Public-Trained (372, 0.6%), Home-Trained (N=197, 0.3%), Public-Family (N=1,113, 1.9%), Home-Family (N=47,320, 80.9%), Public-Layperson (N=5,243, 9.0%), and Home-Layperson (N=4,248, 7.3%). AORs (95% CIs) for survival to discharge by Home-Trained, Public-Family, Home-Family, Public-Layperson, and Home-Layperson were 0.63 (0.33-1.19), 0.88 (0.62-1.25), 0.42 (0.31-0.57), 1.25 (0.92-1.70), and 0.47 (0.34-0.65), respectively. AORs (95% CIs) for good CPC by Home-Trained, Public-Family, Home-Family, Public-Layperson, and Home-Layperson were 0.76 (0.35-1.67), 1.03 (0.67-1.58), 0.45 (0.31-0.66), 1.38 (0.94-2.02), and 0.43 (0.29-0.66), respectively. In interaction model, AORs (95% CIs) of the Public-Family group showed 1.15 (0.92-1.44) in daytime (06:00-18:00) and 1.28 (1.05-1.56) in night time (18:00-06:00). **Conclusions:** The Place-Provider-Matrix can categorize OHCA population by CPR provider and arrest place. This analysis can help focus on which group has lower CPR outcomes and distribute social resources effectively. Private place with family and layperson needs further resources to improve CPR outcomes.

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Out-of-Hospital Resuscitation of Pregnant Cardiac Arrest by 119 Emergency Medical Service System

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Background and Objectives: When a heart attack occurs in the pregnancy, the most important thing is to resuscitate the pregnant woman. There is a difference to the general core and other parts of the heartland in pregnant women because mother and fetus must be taken into account at the same time. Determining whether to deliver a fetus from a pregnant cardiac arrest patient is very important for both the mother and the fetus. Even if CPR is performed, not all patients who are pregnant are revived, rather how quickly and accurately CPR is performed determines the survival rate of the patient. **Methods:** A case study. **Results:** At the time of the sighting, a 30-year-old pregnant woman had fast recognition by her guardian, rapid reporting and cardiopulmonary resuscitation, and then received professional resuscitation by the 119 unit. This is the case that both the patient and the fetus were released from the hospital six days after proper treatment. **Conclusions:** In the prenatal stage, it is rare for pregnant patients to be transported for the return of spontaneous circulation and they are rarely given professional heart rescue. This study is to report a case on a pregnant woman who had a heart attack and was CPR by witnesses and was discharged from the hospital after the return of spontaneous circulation through a professional heart resuscitation by a 119 member at the scene.

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**PO_EMS_03_04**

Implementation Of Ambulance Satellite Stations In Kota Kinabalu, Sabah

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Background and Objectives: Ambulance response time (ART) is defined as the time interval from the time of emergency call received by paramedics to the ambulance arrival time on-scene (1). Numerous studies have demonstrated that shorter ART correlates with increased patient survivability (2, 3, 4). The objective of this study is to evaluate the effects of ambulance satellite stations (SS) on ART in Kota Kinabalu. **Methods:** Two locations for ambulance SS were determined through analysis of 4 years of historical data using an ambulance geolocation system by which GPS locations were marked and plotted against time during ambulance movement. During the study period (Jan-Dec 2017), the Sabah Women and Children’s Hospital Emergency Medical Service (EMS) team was deployed to these two locations during the designated peak hours. EMS activation time, EMS ART (despatch & travel time) to scene, EMS distance to scene, location of scene were recorded. Null hypothesis suggests that there is no difference in ART after establishment of SS in relation to pre-intervention data (Jan-Dec 2016). **Results:** T-test was used to analyse mean ART and travel distance difference between 2016 (n=140) and 2017 (n=132). Trauma cases accounted for 38.8%. Pre-SS establishment, the mean ± SD EMS travel distance to scene and mean ± SD EMS ART to scene was 5.80 ± 2.65 kilometres and 14.64 ± 5.49 minutes, while after SS was 5.43 ± 2.67 kilometres and 10.53 ± 5.18 minutes. There was statistically significant difference (p<0.01) between mean EMS travel distance to scene and mean EMS ART to scene pre-SS and after SS establishment. **Conclusions:** Null hypothesis rejected and there was significant reduction in mean (SD) of ART after the establishment of SS mainly shaving time off despatch and travel times.

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A Short Term Outcomes among Ambulance and Non-ambulance Utilization in Patients with Emergency Severity Index 1 and 2
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Background and Objectives: To compare the short-term outcomes between non-ambulance service used and those who used ambulance service in a middle income country.

Methods: This study was a retrospective chart review. We included patients aged 18 years and older who presented with the Emergency Severity Index (ESI) level 1 and 2 at the emergency department (ED) in one urban teaching hospital, Thailand between January 1st and June 30th, 2017. We randomly selected 399 patients from the electronic medical record. Data were abstracted by 4 paramedics and tested with kappa analysis for interrater reliability = 0.89. We compared baseline characteristics and the short term outcomes at 30 days between two groups.

The outcomes were defined as ED revisits, hospital admission, modified ranked scale (mRS) and mortality rate. Results: A total of 399 patients were included to our study. The ambulance used as mode of arrival in 84 (20.8%) patients. Among ambulance used 15 (3.8%) arrived to the ED by first responder (FR)/basic life support (BLS) car and 68 patients arrived to the ED by using advanced life support (ALS) car. Ambulance used group had higher ESI Level 1 compared with non-ambulance used group [19 (22.9%) vs. 24 (7.6%) p-value 0.049]. Ambulance used group had trauma conditions more than non-ambulance used group [26 (31.3%) vs. 13 (4.1%) p-value <0.01]. Ambulance used group had more hospital admission rate and mortality rate at 30 days compared with non-ambulance used group [hospital admission rate 65 (78.3%) vs. 191 (60.4%) p-value <0.01, mortality rate at 30 days [21 (25.3%) vs. 36 (11.4%) p-value <0.01]. ED revisits rate and mRS were not difference between two groups.

Conclusions: In this study, it presented the patients in one middle income country used ambulance car only twenty percent and had more severity than non-ambulance used group.

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Identification of Risk Patients in Emergency Medical Services
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Background and Objectives: Inadequate nutrition has been associated with growing risk of falling and impaired ability in elderly patients. Falling is a significant threat to the health of the elderly. It is estimated that one third of people over the age of 65 experience at least one falling each year. Over 60% of the falls cause serious injury or disability. Adequate nutrition increases the muscle strength of the elderly. Therefore, determining and managing the nutrition level is important for preventing falling. As far as we know emergency medical services has never before reported being a part of prevention by performing risk identification. The purpose of the study is to assess whether it is possible to use a simple screening tool to find out the risk of falling, the nutritional status and the level of cognitive functioning activity when the EMS faces the elderly over the age of 70 years. In addition, the flow of information between primary care and emergency services and nutritionists is examined.

Methods: Identification of poor nutrition is carried out in the Helsinki University Hospital area. All people over the age of 70 requiring ambulance are examined.

Results: There were no difference in compression speed (p=0.066) and fraction of compression (p=0.114) between external chest compression in static or moving condition. Depth of compression were better in a moving ambulance compared to static condition (1.45; SD 0.65-1.56, p<0.0001). The Amio group showed statistically significant higher hospital cost (30 days, No-drug vs. Others vs. Amio, mean $18,986 vs. 15,825, p<0.0001) and longer-term (1 year: 13,279 ± 3,844 vs. 6,161 ± 7,450 vs. 6,383 ± 9,100, p<0.0001; 1 year: 13,279 ± 18,986 vs. 15,825 ± 20,551 vs. 21,372 ± 15,778, p<0.0001).

Conclusions: In cardiac arrest with shockable rhythm, using amiodarone was shown to be more effective in reducing the long-term hospital cost and hospital stay.

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Comparison of Hemodynamic Effect Between the Newly Developed Motor-driven Simultaneous Sterno-thoracic Cardiopulmonary Resuscitation Device and LUCAS 2 in a Swine Model of Cardiac Arrest
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Background and Objectives: We conducted a study to compare hemodynamic effect between newly developed motor-driven simultaneous sterno-thoracic cardiopulmonary resuscitation device (X-CPR 2) and Lund University cardiac arrest system (LUCAS 2).

Methods: Twenty-five pigs were divided into two groups...
n=13 in X-CPR2 group). After 2 minutes of ventricular fibrillation (VF), all received CPR with 30:2 compression-to-ventilation ratio for 6 minutes. Thereafter continuous chest compression and intermittent ventilation at rate of 10 per minute were followed for 12 minutes. 2 J/kg was delivered at 6 minutes after VF induction and energy was modified to 4 J/kg if cardiac rhythm was VF on defibrillator. Epinephrine 1 mg was injected every 4 minutes from 8 minutes after VF induction. Hemodynamic parameters including mean aortic pressure (MAP), right atrial pressure (RAP), coronary perfusion pressure (CPP), carotid blood flow (CBF) and end-tidal carbon dioxide pressure (ETCO2) were measured at baseline and every 2 minutes after VF induction. Return of spontaneous circulation (ROSC), 2 hours survival, 24 hours survival and cerebral performance category (CPC) at 24 hours were evaluated. Autopsy was performed to evaluate the device-induced mechanical complications including rib fracture, lung contusion, hemotorax, hemopericardium and hemoperitoneum. Results: Hemodynamic parameters were not different between groups except RAP (p = 0.002). Total epinephrine dose, defibrillation frequency, rate of ROSC, 2-hour survival rate, 24-hour survival rate and good neurologic outcome (CPC ≤ 2) were also not different between groups. There was also no difference in mechanical complications between groups. Conclusions: The hemodynamic effect was not different between X-CPR2 and LUCAS. RAP was maintained higher in X-CPR2 group. 

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Prognostic Performance of Simplified OHCA and CAHP Scores in an East Asian Population: a Prospective Cohort Study
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Background and Objectives: Both OHCA (Out-of-hospital cardiac arrest) and CAHP (Cardiac Arrest Hospital Prognosis) scores were developed for early neuroprognostication of OHCA patients. Calculation of these scores required estimation of collapse time, which may be imprecise. We aimed to validate simplified OHCA and CAHP scores in an East Asian cohort. Methods: This was a single-centre prospective observational study. Consecutive OHCA patients between January 2011 and March 2017 were screened. Simplified OHCA and CAHP scores were calculated as the original OHCA and CAHP scores with the low-flow interval omitted. Multivariate logistic regression analysis was used to study the associations between independent variables and outcomes. Areas under the receiver operating characteristic curve (AUROC) were compared by paired Delong's test.

Results: A total of 412 patients were included. Most variables included in the simplified OHCA and CAHP scores were also significantly associated with neurologial outcome in our cohort. Simplified OHCA and CAHP scores were inversely associated with favourable neurological outcome. The AUROC demonstrated excellent discriminatory performance for both scores (AUROC for simplified OHCA score: 0.82, 95% confidence interval: 0.77-0.86; AUROC for simplified CAHP score: 0.84, 95% confidence interval: 0.80-0.89). The comparison of AUROC between simplified OHCA and CAHP scores did not indicate significant difference (p-value = 0.19). Conclusions: The simplified OHCA and CAHP scores could predict neurological outcome with similarly excellent accuracy among successfully resuscitated OHCA patients in an East Asian population. The original or simplified OHCA and CAHP scores may serve as a risk-adjustment tool to compare outcomes between regional OHCA registries worldwide.

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Improving the Position of Resuscitation Team Leader with Simulation (IMPORTS); a Pilot Cross-sectional Randomized Interventional Study
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Background and Objectives: Leadership and teamwork are important contributory factors in determining cardiac resuscitation performance and clinical outcome We aimed to determine whether fixed positioning of the resuscitation team leader (RTL) relative to the patient influences leadership qualities during cardiac resuscitation using simulation. Methods: A cross-sectional randomized interventional study over twelve months' duration was conducted in university hospital simulation lab. ACLS-certified medical doctors were assigned to run two standardized simulated resuscitation code as RTL from a head-end position (HEP) and leg-end position (LEP). They were evaluated on leadership qualities including situational attentiveness (SA), errors detection (ED), and decision making (DM) using a standardized validated resuscitation-code-checklist (RCC). Performance was assessed live by two independent raters and was simultaneously recorded. RTL self-perceived performance was compared to measured performance. Results: Thirty-four participants completed the study. HEP mean marks for SA was 3.74 (SD ± 0.96), ED 2.43 (SD ± 1.24), and DM 4.53 (SD ± 0.98). While LEP scored 3.54 (SD ± 0.92) for SA, 2.21 (SD ± 1.14) ED, and 4.47 (SD ± 0.73) DM. The mean total marks was 10.69 (SD ± 1.82) vs. 10.22 (SD ± 1.93) at HEP and LEP respectively (p-value 0.29). HEP scores were higher in all parameters. Majority of participants preferred LEP because of more room for movement, better visualization of surroundings and communication with team members. RTL's self-perceived performance does not correlate with their actual performance. Conclusions: The physical position either HEP or LEP appears to have no influence on performance of RTL in simulated cardiac resuscitation. RTL should be aware of the advantages and limitations of each positions.

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Anomalous Right Coronary Artery Causing Exercise-Related Cardiac Arrest
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Background and Objectives: Anomalous origin of the right coronary artery (ARCA) is a rare but life-threatening condition, which can cause myocardial ischaemia and malignant arrhythmias during exercise and precipitate cardiac arrest in young, previously healthy individuals. ARCA is a rare cause of out of hospital cardiac arrest (OHCA), with an incidence of between 0.026 and 0.250%. Methods: We re-
port a case of OHCA in a previously well and asymptomatic 15-year-old boy, who collapsed while playing basketball. Bystander cardiopulmonary resuscitation (CPR) was performed. Paramedics arrived 10 minutes later, 2 shocks were administered with an automated external defibrillator. In the Emergency Department, he was in ventricular fibrillation which was successfully cardioverted with return of spontaneous circulation which occurred 44 minutes after cardiac arrest. He was intubated and mechanically ventilated, post resuscitation care and therapeutic hypothermia was instituted. Results: Transthoracic echocardiography (TTE) showed moderate global hypokinesia with an ejection fraction of 40%. There was no ventricular hypertrophy, intracardiac shunts, valvular abnormalities. Transesophageal echocardiography (TEE) revealed possible ARCA. Computed tomographic (CT) coronary angiogram confirmed an ARCA arising from the superior aspect of the left coronary cusp with an inter-arterial course between the aorta and the pulmonary trunk. He was in cardiogenic shock requiring norepinephrine and dobutamine support during his stay in the Coronary Care Unit. The patient was subsequently extubated on day five of hospitalisation after reversal of coagulopathy. He then underwent minimally invasive corrective surgery one month later. He is currently back attending school. Conclusions: There are various causes of exercise-related OHCA, of which congenital coronary artery anomalies account for 12-20% of the cases. ARCA are usually silent until the index cardiac arrest event. This group of patients are usually asymptomatic with normal resting electrocardiogram, hence the difficulty in screening and diagnosis of ARCA. Corresponding Author: Dr. Siti Nasrina Yahaya (radonsny@yahoo.com)

Predictive Performance of Plasma Neutrophil Gelatinase-associated Lipocalin For Neurologic Outcomes in OHCA Patients Treated with TTM

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Background and Objectives: To evaluate the usefulness of plasma neutrophil gelatinase-associated lipocalin (NGAL) in predicting neurologic outcome and mortality in out-of-hospital cardiac arrest (OHCA) patients treated with targeted temperature management (TTM). Methods: We enrolled 75 patients treated with TTM and collected their demographic data, cardiopulmonary resuscitation-related information, data on plasma NGAL concentration, and prognostic test results. Plasma NGAL was measured at 4 hours after return of spontaneous circulation (ROSC). We evaluated the association between plasma NGAL and endpoints such as neurologic outcome and 28-day mortality using multivariate analyses. We also compared the predictive performance of plasma NGAL with that of other traditional prognostic modalities for outcome variables. Results: Thirty patients (40%) had good neurologic outcomes and 53 (70.7%) survived more than 28 days. The plasma NGAL in patients with good neurologic outcomes was 122.7 ± 146.7 ng/mL, which was significantly lower than that of the poor neurologic outcome group (307.5 ± 269.6 ng/mL; p < 0.001). The probability of poor neurologic outcome was more than 3-fold in the NGAL > 124.3 ng/dL group (odds ratio, 3.321; 95% confidence interval [CI], 1.265–8.721). The plasma NGAL in the survived group was significantly lower than that in the non-survived group (172 ± 191.6 vs. 379.9 ± 297.8 ng/mL, respectively; p = 0.005). Plasma NGAL was significantly correlated with 28-day mortality (hazard ratio 1.003, 95% CI 1.001–1.004; p < 0.001). The predictive performance of plasma NGAL was not inferior to that of other prognostic modalities except electroencephalography. Conclusions: Plasma NGAL is valuable for predicting the neurologic outcome and 28-day mortality of patients with early-stage OHCA after ROSC. Corresponding Author: Yoo Seok Park (pys0905@yuhs.ac)

Double The Shock: Surviving The Electrical Storm

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Background and Objectives: Double sequential defibrillation (DSD) was first tested in canine model in mid-1980s, followed by human cardiology literature for refractory ventricular fibrillation (VF), a rare condition which still have no current established best treatment. Methods: A 43 years old gentleman presented with out-of-hospital cardiac arrest. Cardiopulmonary resuscitation (CPR) was initiated immediately at pre-hospital team and followed by 2 times of defibrillation. He was transported to Emergency Department rapidly. CPR was continued, and intubation performed. He was given defibrillation at 2003 for 15 times loaded with IV amiodarone bolus in total of 450 mg followed by infusion in view of refractory VF. In addition, he received second line antiarrythmic drug, lignocaine 10% total of 150mg in bolus dosage. Other standard management such as iv adrenaline total of 15mg and iv sodium bicarbonate total of 200mg were administered. We considered DSD in view of persistent refractory VF despite standard management. After 55min post arrest, we managed to revive the patient and initial 12-lead ECG showed extensive anterior myocardial infarction (MI). He was decided for thrombolytic therapy in view of inavailability of urgent percutaneous coronary intervention (PCI) therapy. He was admitted to Cardiology Care Unit without inotropic support. However, his condition deteriorated 12 hours later and succumbed to death after 72 hours post admission. Results: DSD can be used in refractory VF after multiple attempts of single defibrillation and standard medications have been given. It is believed that DSD will defibrillate the myocardium with a broader energy vector causing more complete depolarization. DSD is not the standard treatment recommended in managing refractory VF arrest due to lack of evidence. However, health care provider may consider this method as the last resort in managing patient with persistent refractory VF. Conclusions: DSD may improve the survival of the out-of-hospital cardiac arrest that presented with persistent refractory shockable rhythm. Corresponding Author: Dr. Siti Nasrina Yahaya Dr Siti Nasrina Yahaya (radonsny@yahoo.com)

No Gender Differences Found in Bystander CPR in Prague

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Background and Objectives: The aim of our study is to compare bystander resuscitation ratios between male and female cardiac arrest patients. Methods: This is a retrospective analysis of Prague pre-hospital cardiac arrest Ustein-style registry from 2012 to 2016. All patients resuscitated by EMS crew with exception of EMS-witnessed cardiac arrests were included. Results: Total 2,302 patients were included. There were 1,715 men (M group) and 587 in women (W group) in the study. Bystander CPR was provided in 1,368 (79%) cases in M group and in 477 (81%) cases in W group. The difference between M and G groups is non-significant (p = 0.31). Conclusions: We found no gender differences in the chance of cardiac arrest victim to receive bystander CPR. This finding is in contradiction with the results published by A. Blewer at the American Heart Association’s Scientific Sessions in November 2017, where men are more likely to receive CPR in public than women. One possible explanation is the systematic approach of the EMS Prague dispatchers to provide the dispatcher-assisted resuscitation (D-CPR), which can break potential barriers between bystander and cardiac arrest victim. Corresponding Author: Petr Kolouch

Pre-hospital Resuscitation of Children in the City of Prague

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Background and Objectives: While there is a lot of studies dealing with out of-hospital cardiac arrest (OHCA) in adults, data about OHCA in children age (CH-OHCA) are rarely published. The aim of this study is to describe epidemiology and results of CH-OHCA in City of Prague. Methods: This is a retrospective analysis of epidemiology and survival rates of CH-OHCA during 13 years period from 2003 to 2015. The data are taken from Prague OHCA Utstein-style database. Children age was defined as age from 0 to 179 years. Results: In the study period, there were 6 626 OHCA attended by Prague EMS, of which 121 met the criteria of CH-OHCA (1.8%, 0.78 CH-OHCA per 100.000 inhabitants and year). The majority of CH-OHCA occurred in age groups 0-0.99 (81%) cases in W group. The difference between M and G groups is non-significant (p < 0.05) and 1-1.99 (26; 21.5% p < 0.05). In no other age group the number of CH-OHCA exceeded 9 (n/a). No CH-OHCA was witnessed by ambulance personnel. Layperson CPR was performed in 95 cases (78.5%). Full BLS was delivered in 36 cases (37.9%), while in 59 cases (62.1%) compressions-only CPR was provided. The first captured rhythm was most often asystole (96; 79.4%). Ventricular fibrillation (VF-first subgroup) as the first rhythm was present in 12 patients (10.0%), half of whom were 15+. The most common cause of CH-OHCA was recorded as unknown (39%). The overall survival rate from CH-
OHCA (with CPC 1-2) was 10.7%, in VF-first subgroup it was 41.7%. **Conclusions:** CH-OHCA is relatively rare event. The most vulnerable group is children under 2 years of age. Small children are most frequently found in asystole, while VF occurs more frequently in age over 15. Even though CH-OHCA is uncommon in pre-hospital setting, everyone in the emergency service must be adequately trained for it.

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**PO_RES_07_05**

**Novel Wearable Cooling Device For Early Initiation of Targeted Temperature Management in the Emergency Department: a Retrospective Cohort Study**

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**Background and Objectives:** Targeted temperature management (TTM) is an important component of post-cardiac arrest care. Although the optimum cooling method is not known, studies have suggested that prompt and quick cooling is associated with better outcomes. The aim of this study was to evaluate the cooling efficacy of a protocol including a novel cooling device in the Emergency Department (ED).

**Methods:** This was a single-center pre-post cohort study of post-cardiac arrest patients with return of spontaneous circulation (ROSC), for whom TTM was initiated at the discretion of the consultant. A prospective data set was kept between April 2015 and December 2017. A surface cooling device (CarbonCool, Global Healthcare Pte Ltd), which uses a graphite cooling material in an insulating suit, was introduced in July 2015. Control patients enrolled before the intervention period received icepacks in the ED and cold saline. For both periods, the target temperature was 34.0°C, with TTM continued in the ICUs. The primary outcome was time from ROSC to target temperature (TT).

**Results:** Of 124 patients included, 40 were in the intervention period and 84 in the control period. Time from ROSC to TT was significantly lower in the intervention period at 119 (IQR: 65-250) minutes vs. 482 (IQR: 356-596) minutes (p < 0.001). There was no statistical difference in survival to discharge (32.1% vs. 37.5%, p = 0.839) and Glasgow-Pittsburg Outcome scores (1 or 2 in 17.5% vs. 21.4%, p = 0.811). The intervention period also had a faster cooling rate (initiation of TTM to TT of 73 (IQR: 40-150) vs. 142 (IQR: 75-262) minutes, p = 0.014). There were no reported serious adverse events associated with the device.

**Conclusions:** Use of a novel cooling device in the ED resulted in a shorter time to target temperature. As it is reusable and does not require a power source, it has potential to be an affordable solution for pre-hospital and transport cooling.

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**PO_RES_07_06**

**A Shorter Duty Cycle Is Associated With Higher End-tidal CO2 Level During Cardiopulmonary Resuscitation.**

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**Background and Objectives:** The aim of this study was to investigate whether a duty cycle of 33% is associated with higher end-tidal CO2 (ETCO2) level during cardiopulmonary resuscitation (CPR) compared with a duty cycle of 50%. **Methods:** Six pigs were assigned to the ‘DC33%’ group (n = 3) or an ‘DC50%’ group (n = 3). After induced cardiac arrest, chest compression was provided for 5 min with a duty cycle of 50%.

**Results:** ETCO2 during 5 min of chest compression was higher in the DC33% group compared with the DC50 group (22.5 ± 4.5 mmHg vs. 21.6 ± 5.9 mmHg, P = 0.033). In a linear mixed model, duty cycle of 33% affected ETCO2 significantly (P = 0.002), increasing ETCO2 in the DC33 group by 0.96 ± 0.31 mmHg compared with DC50 group. The interaction between ETCO2 and time was significant (P < 0.001), and ETCO2 increased over time in the DC33 group (0.61 mmHg/min; 95% CI, 0.26–0.96 mmHg/min) while ETCO2 decreased in the DC50 group (-0.64 mmHg/min; 95% CI, -1.12–-0.17 mmHg/min). **Conclusions:** A duty cycle of 33% increased ETCO2 during CPR compared with a duty cycle of 50%. Moreover, ETCO2 increased over time during CPR with a duty cycle of 33% while ETCO2 decreased with a duty cycle of 50%.

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**PO_RES_07_07**

**The Girl Who Lived - Surviving an Out-of-hospital Cardiac Arrest with Early Bystander Cardiopulmonary Resuscitation (CPR)**

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**Background and Objectives:** Cardiac arrest is one of the leading causes of death worldwide. It is time-dependent in which the earlier the resuscitation process is initiated, the better the outcome is. Late commencement of cardiopulmonary resuscitation will lead to worse neurological sequelae. The chain of survival stresses on early activation, early cardiopulmonary resuscitation, early defibrillation and early advanced care. Cardiac arrest can occur anywhere and everywhere thus bystanders play a major role in linking all these chains together.

**Methods:** A case report.

**Results:** We present a case of an unfortunate 28-year old lady who developed cardiac arrest post drowning and survived the ordeal with no neurological deficit. This young lady allegedly slipped and fell into a stream near a waterfall. She was submerged in the water for 15 minutes before being pulled out by rescue divers. She was noted to be having any spontaneous breathing and pulse hence cardiac arrest was diagnosed. Cardiac arrest occurred in the prehospital setting. She was intubated and transferred to the intensive care unit. She recovered rapidly with no neurological deficit and was discharged well after 6 days of hospitalization.

**Conclusions:** Bystanders play an essential role in delivering early cardiopulmonary resuscitation in public places. This case highlights the importance of public awareness to achieve a higher survival rate and better prognosis for patients experiencing cardiac arrest.

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**PO_TOX_02_01**

**Two Cases of Wild Mushroom Poisoning; Podostroma Cornu-damae**

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**Background and Objectives:** In Korea, it is not rare to see patient who accidentally took poisonous mushroom. Most known poisonous mushroom is the genus Amanita, which has the toxin amatoxin. The Podostroma cornu-damae is one of wild mushroom belongs to the Hypocreaceae family and contains trichothecene mycotoxin. There were few cases reported about this mushroom ingestion before, but not quite often reported. We report two cases of Podostroma cornu-damae ingestion.

**Methods:** Case review of two patients who ingested poisonous mushroom.

**Results:** This case report showed two patients who ingested trichothecene mycotoxin by mistakenly took Podostroma cornu-damae. After three days, both complained of gastrointestinal symptoms but resolved soon. One of them had neutropenic fever almost three weeks from the ingestion. The other one had thrombocytopenia but had no hypotension. Whenever we think of the mushroom ingestion, respiratory failure and liver injury comes first in mind as urgent cases. However, these cases showed asymptomatic pancytopenia could progress especially in young ages which means unknown mushroom poisoning cases might have been missed.

**Conclusions:** Gastrointestinal symptoms only could be a clue for the mushroom poisoning. As well as abnormal finding in blood counts could be the clue. The onset of symptoms can be variable depending on types of toxin, amount of ingestion, and way of cooking. Physicians should always consider of mushroom ingestion.

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**PO_TOX_02_02**

**The Usefulness of Non-contrast Abdominal Computed Tomography**
For Detection of Residual Drugs in the Stomach of Patients with Acute Drug Overdose
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Background and Objectives: If clinicians can know that there are many life-threating drugs left in the stomach through a non-invasive method over 60 minutes after drugs ingestion, it may be preferable to minimize absorption of remnant drugs through various methods according to the characteristic of the drug. Computed tomography (CT) has gained wide acceptance in the detection of drug mules. Therefore, we evaluated the prevalence of drugs in the gastric lumen using abdominal non-contrast CT, performed over 60 minutes after acute drug poisoning.

Methods: This was a prospective cohort study of patients with acute drug poisoning who were admitted to the emergency department (ED) between March 2017 and February 2018. If the patient visited the ED over 60 minutes after ingestion of life-threatening or unknown drugs, non-contrast CT scan was performed.

“Presence of drugs” was defined in the non-contrast CT as a round shaped lesion with higher density than the gastric mucosa. In addition, “positive radiodense image” was defined as that with higher density than the gastric mucosa regardless of drug appearance in the non-contrast CT scan. Results: Among a total of 482 patients with drug poisoning, 140 were finally included in the study. Residual drugs were detected in 36 patients (25.7%). Further, regardless of the presence of drugs, 58 patients (41.4%) showed positive radiodense image in the stomach. The median Hounsfield unit of drugs was 131.5 and that of food materials was in the stomach was 34.5. Total duration of hospital stay was significantly longer in the “absence of drug” group and sustained-release drugs were detected more frequently in the “presence of drugs” group.

Conclusions: Detection rate of drugs and presence of positive radiodense image, regardless of drug appearance, were as high as 25.7% and 41.4%, respectively. Sustained-release drugs were detected more frequently in the “presence of drugs” group.

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A Case of Organophosphate Intoxication, Whose Symptoms Mimic Those of Stroke
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Background and Objectives: Organophosphate toxicity may present neurological symptoms that mimic those of cerebral stroke. Because stroke cases require prompt intervention, emergency physicians sometimes start preparing interventions based on information from the emergency medical services (EMS). This may, however, bias physicians’ diagnosis process. We report an organophosphate toxicity case who underwent prolonged diagnosis process because of her stroke-like symptoms.

Methods: Case. An eighty-four-year-old female collapsed claiming headache and nausea with vomiting. Her daughter contacted the EMS. On EMS arrival, she presented left conjugate deviation of the eyes, right facial paralysis, and seizure on the right upper extremity. These focal signs, which made the EMS personnel strongly suspect cerebral stroke, met the criteria of stroke presentation based on information from the emergency medical services (EMS). This was a prospective cohort study of patients with acute drug poisoning, 140 were finally included in the study. Residual drugs were detected in 36 patients (25.7%). Further, regardless of the presence of drugs, 58 patients (41.4%) showed positive radiodense image in the stomach. The median Hounsfield unit of drugs was 131.5 and that of food materials in the stomach was 34.5. Total duration of hospital stay was significantly longer in the “absence of drug” group and sustained-release drugs were detected more frequently in the “presence of drugs” group.

Conclusions: Detection rate of drugs and presence of positive radiodense image, regardless of drug appearance, were as high as 25.7% and 41.4%, respectively. Sustained-release drugs were detected more frequently in the “presence of drugs” group.

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To Compare the Effectiveness of Gastric Lavage-Charcoal vs. Charcoal-Gastric Lavage in Organ Phosphate Compound Poisoning
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Background and Objectives: Lavage may increase gastric emptying of the toxin, or using charcoal first may adsorb the residual toxin which can be aspirated. So an effort was made to formalize a protocol decontamination approach for poison patients to benefit their outcome. To compare the effectiveness of Gastric Lavage-Charcoal vs. Charcoal-Gastric Lavage in Organ Phosphate Compound Poisoning.

Methods: This is a case controlled comparative study conducted in Vinayaka Mission Hospitals from July 2008 to July 2010. All OPC poisoning patients aged more than 18 years presenting directly to our ED were included in this study. Every alternative week cases were included in control and study group respectively. The control group was given initially Gastric Lavage followed by administration of Activated Charcoal. The study group was given initially charcoal followed by gastric Lavage.

Results: A total of 108 cases were included; 56 cases belonged to study group. The ratio between control group: study group in mean duration (days) in ICU was 5.4:3.5, mean duration (days) in hospital was 7.08: 5.16, mean duration (days) required ventilatory support was 7.67: 4.69, percentage of OPC induced complication was 52:32.14, mean duration (days) of cholinergic symptoms was 4.6:2.81. All the parameters were found to be lesser in the study group as compared to the control group with a statistically significant p value<0.05. Conclusions: Charcoal-Gastric Lavage has a better outcome than Gastric Lavage-Charcoal in organophosphate compound poisoning.

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PO_TOX_02_04

Tree Barks, Brady and Bloodlessness
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Background and Objectives: Tree bark, leaves and seeds consumption is common in india because of their easy availability in the tropical and subtropical areas. Most of these poisons causes cardiac arrhythmia. Among them most common type of poisoning is with cardiac glycosides. It is found in various group of plants. Most common is oleander. Cardiac glycosides mainly affect the heart and it causes significant arrhythmias and it also had extracardiac manifestations. Here we are presenting with unknown bark consumption and how it manifested in the patient.

Methods: A 30 years old female patient with no comorbidities presented to our ER with consumption of crushed bark mixed with water as a treatment for some allergy. She was presented with 3-4 episodes of vomitting and 4 episodes of loose stools. On arrival to our ER, Her HR is around 55/min with mild fluctuations. Her Blood pressure was 80/50 mmHg. Her ECG showed JUNCTIONAL RHYTHM with some ST changes. Results: Resuscitations has been started with crystalloids. In view of presentation and ECG changes, we have suspected it could be cardiac glycoside poisoning as it is most common cause of poisoning. Her digoxin levels were 0.95 ng/mL and CPK levels are 22353/1. And other parameters were within normal limits. During the course of her stay, she was treated with activated charcoal. She developed acute limb ischemia on day 2 probably due to vasopressor requirement / infusion which was treated surgically. She gradually improved and was discharged on day 20. Conclusions: High level of suspicion is required while treating plant poisons. Primary survey followed by resuscitation along with a search for the cause by relevant investigations is mandatory. Digi Fab is not available in India and digoxin toxicity responds to treatment with activated Charcoal.

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Mass Casualty Incident: Ammonia Gas Leak at an Ice Plant
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Background and Objectives: Highly pressurised liquid ammonia is widely used as a refrigerant. Ammonia is a gas or vapour at ordinary temperatures. When a leak of this highly pressurised liquid ammonia occurs it is rapidly transformed into a gas. Ammonia gas is an irritant which reacts with water in tissue forming a strong alkaline solution, ammonium hydroxide. This endothermic reaction causes significant thermal injury resulting in severe alkaline chemical burns to the skin, eyes and respiratory tract. Methods: We report a mass casualty incident where twenty seven factory workers suffered significant ammonia gas toxicity after an industrial accident which caused an ammonia gas leak. There were two casualties who died at the scene. A further eleven cases required intubation and intensive care as a consequence of severe ammonia gas toxicity. Results: Patients who presented with severe toxicity developed severe laryngeal edema requiring intubation for airway protection. Two patients who were at a closer proximity to the gas leak also suffered non-cardiogenic pulmonary edema. All patients complained of varying degrees of ocular irritation with two cases suffering significant ocular as well as dermal chemical burns. Cases were sent according to severity to four different hospitals. All intubated cases were admitted to intensive care units and recovered well. Conclusions: Ice plants or factories using highly pressurised liquid ammonia should have early warning systems in place to alert workers and emergency response. Good supportive care with skin and ocular decontamination was crucial in patient management. The emergency medical response for this mass casualty incident was managed to prevent overburdening the intensive care units of any one hospital with careful distribution of code red cases to four different hospitals.

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A Case of Amitraz Poisoning Encountered in Ipoh General Hospital, Malaysia—a Clinical Conundrum
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Background and Objectives: Amitraz poisoning is emerging in the twenty-first century. To date, there is no clear protocol regarding its management. We seek to bring attention to this widely available poison in Malaysia. Methods: A 13-year-old girl with good past medical history was brought to the Emergency Department 1 hour after suicidal ingestion of an unknown quantity of dog lice medicament which was later found to contain Amitraz. She had vomited twice, and was drowsy with shallow breathing. Her pupils were 2 mm bilaterally and sluggishly. Her vitals were: BP 109/80, HR 56, and temperature 36.8°C. Her blood gas showed type 2 respiratory failure with pCO2 of 52.5 mmHg. Her capillary blood sugar was 8.7 mmol/L. She was intubated for airway protection and respiratory depression. Ryle’s tube inserted and gastric content aspirated with 50 g of activated charcoal administered. A single dose of IV Atropine 0.5 mg was given for relative bradycardia. She was admitted to the intensive care unit with good supportive management and extubated 19 hours later. She was discharged uneventfully 3 days later. Results: Amitraz belongs to formamidine class of pesticides, available as veterinary ectoparasiticide and agricultural insecticide. It acts as an α2-adrenoceptor agonist with pharmacological activity similar to clonidine. Poisoning occur through oral, inhalational, or dermal routes. Amitraz causes central nervous system and respiratory depression, hypotension with Bradycardia and gastrointestinal symptoms with hyperglycemia. As clinical presentation might be mistaken as organophosphate or carbamate poisoning, a few clinical characteristics makes it different from those agents including absence of full blown muscarinic symptoms. Early identification of the poison helps the medical practitioner to manage the patient confidently. There is no specific antidote for amitraz poisoning. Management is mainly supportive. Reported cases generally had good outcomes with resolution of CNS depression by 24-48 hours. Conclusions: We report a case of amitraz poisoning and a clinical conundrum, with good clinical outcome.

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Effect of Alcohol Intake on Severity of Injuries by Slip Down
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Background and Objectives: Patients who have drunk alcohol are usually decreased mentality, making it difficult to listen to medical history and do physical examinations. Since it is difficult to assess the severity of the injury, it is not easy to decide whether or not to be actively diagnosed and treated. The purpose of this study was to investigate the effect of alcohol consumption on the severity of injury in patients who were injured by slip down. Methods: Data from the Emergency Department-based Injury In-depth Surveillance (EDIIS) from 2011-2016 was used to analyze slip down cases. Cases were included if they met the following criteria: (1) older than 15 years of age, (2) not transferred from other hospitals, (3) not intentional injury. Patients were classified into non-severe and severe injury group by excess mortality ratio-adjusted injury severity score. Multivariate logistic regression was used to identify the factors related to the severe injury. Results: Among a total of 365,979 subjects, 227,548 patients were included, of which 15,324 (6.7%) were severely injured and 48,581 (21.4%) were alcohol intakes. The accidents occurred frequently in the evening time (16-24 hours: 39.9%) In multivariate analysis, alcohol-intakes had 1.51 odds ratio (OR) of severe injury compared to non-alcohol-intakes (95% confidence interval [CI]: 1.45-1.58). Male (OR: 1.78, 95% CI: 1.71-1.84), injury time of 0-8 (OR: 1.16, 95% CI: 1.11-1.20) and ambulance-use (OR: 1.92, 95% CI: 1.86-1.99) were associated with severe injury. Conclusions: The risk of severe injury was found to be high when slipped down while alcohol intake. Therefore, these patients should be evaluated & treated more actively from the beginning in the emergency room.

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Traumatic Pneumothorax—an Evidence Based Update
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Background and Objectives: Trauma is a major health problem that requires resources and time in the emergency department (ED). Although Advanced Trauma Life Support (ATLS) is the gold standard, operator dependence can affect the quality of care. The primary objective was to identify differences in the numbers and times to lifesaving interventions. The secondary objective was to identify time to investigation, intervention, ED length of stay, and mortality. Methods: This was a single-center prospective non-randomized study that compared an in-house protocol with conventional practice for trauma patients in the ED. The trauma protocol was developed from the recent ATLS guideline and other evidence-based practices. Results: Eighty-nine cases were included in the study. After excluding 16 cases, 32 and 41 cases were in the in-house protocol group and conventional practice group, respectively. Endotracheal intubation was done more frequently in the in-house protocol group (84% vs. 59%, p-value=0.03). Intercostal drainage tube insertion was done faster (11 min [6.26] vs. 35 min [15.84], p=0.02) and pre-arrival notification by emergency medical service increased in the in-house protocol group (66% vs. 30%, p=0.01). Hypothermia in the operating room was found only in the conventional practice group (62% vs. 0%, p=0.007) and warming blanket was used significantly more often in the in-house protocol group (25% vs. 0%, p<0.001). A directed acrylic graph with multivariate analysis was used to identify confounders of the association between the protocol and outcomes. Time to Focused Assessment Sonography in Trauma was significantly shorter in the in-house protocol group (11 min [6.5, 15.6], p=0.019). Conclusions: In addition to the ATLS guideline, the trauma protocol could improve trauma care by reduced time to investigation, early notification of the trauma team in pre-hospital situations, reduced incidence of hypothermia in the operating room, and increased use of warm blanket.

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Native Hip Dislocations Presenting to Emergency Department of Tan Tock Seng Hospital
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**Background and Objectives:** Native hip dislocation is an orthopaedic emergency. This study (1) describes the epidemiology of native hip dislocations presenting to Tan Tock Seng Hospital (TTSH) Emergency Department (ED), Singapore, and (2) identifies factors predictive of a longer length of hospital stay (LOS). TTSH is Singapore’s busiest ED with annual census > 170,000.

**Methods:** A retrospective electronic medical records review was conducted between January 2008 and December 2015. Using descriptive and summary statistics, patient demographics, injury characterizations and management were analysed.

**Results:** Fifty-one patients (73.1\%) men) contributed to 51 dislocations. Mean age was 37.4 years (SD 16.5) and highest incidence was between 21-30 years (29.4\%). Majority were first, posterior dislocations (73.1\%). The commonest aetiology was a motor vehicle collision (MVC) (60.8\%) involving motorcyclists (64.5\%). Associated injuries were common (80.4\%), with lower extremity involvement at 49.6\% and ipsilateral hip fracture at 64.7\%. The head, face (3.3\%) each) and neck region (no injuries) were infrequently injured. Most patients underwent manipulation & reduction (M&R) in ED (78.4\%) with an 80.8\% success rate on first attempt. Mean time-to-reduction was 2.9 hours (SD 3.4) with 88.4\% of hip dislocations reduced within 6 hours.

Mean and median LOS were 10.4 days (SD 8.9) and 8 days (IQR 3.75-13.25) respectively. MVC aetiology (p<0.001), presence of other injuries (p=0.001) and need for surgery (p=0.002) were associated with significantly longer LOS. One-fifth (20.8\%) had LOS>2 weeks with these significant associations: central dislocation (p=0.003), MVC aetiology (p=0.003) and presence of other injuries (p=0.007).

**Conclusions:** The typical patient with a native dislocation is a young, male motorcyclist involved in an MVC. Due to the high-energy transfer associated injuries are common, especially ipsilateral hip fractures. Patients with central dislocations due to MVC presenting with associated injuries will likely require more than 2 weeks of hospital admission.

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Feasibility and Utility of Routine Blood Alcohol Level Testing For Trauma Patients at Kigali University Teaching Hospital
Joseph Niyonzima\(^1\)

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Traumatic Brain and Spinal Cord Injuries - a Descriptive Study in a Tertiary Care Center, Sri Lanka
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**Background and Objectives:** Traumatic brain and spinal cord injury is a leading cause of death and disability in young adults in the developing world. In Sri Lanka, traumatic brain injury continues to be a major public health problem with significant morbidity and mortality. To assess demographical profile, injury pattern and contributing factors in relation to brain and spinal cord injuries, presented to neuro trauma centre of the National Hospital of Sri Lanka. Methods: Methodology. This descriptive prospective study was carried out for a period of one year from January 2013. The data base was used for data collection process for above period. Results: There were 575 participants, majority were males (84.58\%). The mean age was 47.8 years (range 5-94) with the majority in 40-60 years age group (30\%). In view of mechanism of injury, majority suffered from road traffic accident (RTA) (33.4\%), falls (28\%) and assault (10\%). In RTA group, 41\% and 15\% were relate to motorcycle and three-wheeler accidents. Major presenting injury pattern were subdural haemorrhage (26\%) and extradural haemorrhage (18\%). In addition there were significant number of intracranial haemorrhage (14\%), spinal cord injury (6\%), depressed skull fracture (8.3\%) and cerebral contusion (6.8\%). Conclusions: Traumatic brain and spinal cord injury is a major cause of disability. Implementation of preventive strategies as well as repeated educational intervention in regular interval in community basis is mandatory to improve knowledge and attitude with regards to prevention of brain and spinal cord injury.

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Epidemiology and Outcomes of Sports-related Traumatic Brain Injury in Children
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**Background and Objectives:** Traumatic brain injury is one of the leading causes of pediatric disability that results in many ED visits and hospitalizations. Sports injuries are a common cause of pediatric TBI, but information on demographic and outcomes of sports-related TBI is limited. The aim of this study was to examine the demographics of sports-related TBI. Methods: We performed a multi-center observational study using the Emergency Department-Based Injury Surveillance System database in Korea. Patients between 5 and 18 years, who had unintentional, sports-related head injury between January 2011 and December 2016 were included. The main exposure was the type of sports. Sports type was classified into 6 categories (field sports, floor sports, bicycle and street sports, water sports, racket sports, and others). The primary outcome was TBI, and the secondary outcome was admission. Multivariable logistic regression analysis was performed to calculate adjusted odds ratios for outcomes by sports type. Results: Of 1,537,617 injured patients, 10,717 (0.7%) patients were eligible for study. The most prevalent sports type was field sports (51.8\%). Most of the patients were male (87.5\%), and proportion of TBI and admission were 15.7\% and 3.5\%, respectively. The OR of TBI compared to field sports was 1.77 (95% CI 1.37-2.28) in bicycle and street sports, 0.87 (95% CI 0.76-0.99) in floor sports, 0.59 (95% CI 0.44-0.79) in water sports, and 0.27 (95% CI 0.18-0.40) in racket sports. The AORs of admission compared to field sports were 2.21 (95% CI 1.39-3.52) in bicycle and street sports, 1.83 (95% CI 1.21-2.76) in racket sports, and 0.37 (95% CI 0.16-0.85) in water sports. Conclusions: The clinical characteristics of pediatric sports-related TBI are affected by sports type and are significantly different. The TBI and admission rate of pediatric sports-related head injury was highest in bicycle and street sports. Prevention strategies for sports-related TBI can be developed by sports type.

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Retrieval, ED, GSA HEMS, Emergency Department Lismore Hospital, NINSWLD, Uni Sydney, UTAS, Australia; \(^1\)ED, Lismore Hospital ED; Australia; \(^2\)ED, Royal Prince Alfred Hospital, Australia; \(^3\)ED, John Hunter Hospital, Australia; \(^4\)Anesthesia, Prince of Wales Hospital, Australia
Background and Objectives: Blood alcohol level is routinely measured in trauma patients in other part of the world and results frequently change management. 349 patients were admitted at the Kigali University Hospital in two months, 60% of them were found to have been under the influence of alcohol and 45% were died. In Africa, Rwanda is the ninth country in road traffic crashes with 32.1% according to WHO statistics in 2013. Objective of the study was to establish if clinician knowledge of blood alcohol level changes patient management in trauma patients and demonstrate feasibility of routine blood alcohol testing in the emergency department. Methods: We did a prospective study. Before data collection, an investigator was conducted for all staff. During the data collection period, the investigator approached the treating physician for each patient and asked if the patient clinically needs a blood alcohol test, if yes, a treating physician filled out a pre result survey. Then the patient was tested for blood alcohol level, and results were reported to the treating physician. At the closure, the treating physician filled out the post result survey. Results: Out of a total of 124 unique cases the treating physician felt the BAC testing was indicated in 95 instances (77%). Forty one (43%) of those tested were positive for alcohol. Average blood alcohol level for those positive was 0.08 with a range of 0.01 to 0.32. Clinical decisions changed after blood alcohol level was checked, however clinical decisions fluctuated just as much in the group for which the treating physician did not requested blood alcohol level testing. Conclusions: Our primary end point looks like the treating physicians changed their minds a lot regarding treatment whether or not BAC was tested. But secondary outcomes are super interesting where 43% of those tested were alcohol positive.

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Cycling Related Major Trauma in Ireland

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Background and Objectives: Cycling as a means of transport or recreational activity is increasing in popularity in Ireland. However, increasing numbers of cyclists may lead to an increased number of bicycle collisions and fatalities. The Road Safety Authority is the governing body for road safety in Ireland, but uses forensic data alone to collate cycling collision statistics. This may lead to an underestimation of cycling injuries in Ireland. Using hospital statistics may provide a greater understanding of cycling trauma in Ireland. Methods: The present study examines cycling related trauma in Ireland using the Trauma Audit and Research Network (TARN) data from hospitals in Ireland for the period 2014 to 2016. The database was interrogated for demographics, mechanism of injury, injury characteristics and patient outcomes. Results: There were 410 cycling collisions recorded in the TARN database which represented 4.4% of trauma captured by TARN for the study period. 79% were male compared with 58% in the overall trauma cohort (p<0.001) and the median (IQR) age was 43.8 years (31.0, 55.7) which is younger than the overall trauma cohort (p<0.001). Cycling collisions had a median (IQR) injury severity score (ISS) of 10 (9, 20) which was higher than the overall trauma cohort. 130 cyclists (54.6%) had a collision with a motor vehicle which was the most prevalent mechanism in this cohort. Conclusions: This study would suggest that injury prevention strategies encompassing separation of road users or velocity reduction may be beneficial. Cycling injuries occurred in a predominantly young male population and cycling related collisions were shown to have higher injury severity scores than the overall population. Using hospital data such as TARN provides valuable information on the injuries sustained by cyclists, but more prospective studies to capture injury mechanism and contributing factors are needed.

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Correlation and Predictive Ability of GAP Trauma Score with the Outcome of Trauma Patients

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Background and Objectives: The trauma scoring system (TSS) is an tool which enables assessment of injury severity in trauma management. However, the applicability of most TSSs are limited as they have complex calculation and labour intensive. GAP score, a simple physiological TSS which consists of 3 components (Glasgow Coma Scale (GCS), Age and Systolic Blood Pressure) was developed recently. This study intend to find the correlation and the predictive ability of the GAP score with clinical outcomes of trauma patients. Methods: This is a retrospective, cross sectional observational study which data is extracted from the National Trauma Registry Database 2009. Trauma patients from 1st January 2009 to 31st December 2009 who were 18 years and older were included. Patients were classified with their GAP score and categorised according to their risk of mortality. The correlation and predictive power of GAP score were compared with their outcomes. Receiver operating characteristics (ROC) curve analysis was performed to evaluate the predictive ability of GAP score. Results: A total of 2347 trauma patients in year 2009 were included; 393 (16.8%) died. Mean (SD) age was 35.85 (15.75) years. Mean (SD) GAP score is 18 (4) IQR 7. There is an association between GAP score categories with in hospital mortality and ICU admission with p value is p<0.001. The area under the curve (AUC) on receiver-operating characteristic (ROC) analysis for the GAP score (95% CI: 0.80 to 1, p<0.001) is 0.805 to predict mortality, 0.846 to predict ICU admission and 0.566 to predict need for surgery. Conclusions: GAP score is a useful tool to stratify of hospital trauma patients mortality and need ICU admission. GAP risk categories also have good correlation with mortality and ICU admission. GAP have good predictive ability for mortality and ICU admission but not in early surgical intervention (<24 hours).

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Use of TRISS and RISC II For Trauma Centre Patients in Hong Kong

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Background and Objectives: Hong Kong trauma registries have been using TRISS
for audit and benchmarking since its establishment in the early 2000. The objective is to compare the predictive ability of probability of survival using TRISS and RISC II for trauma centre patients in Hong Kong. Methods: This was a retrospective cohort study with all five trauma centres in Hong Kong. Adult major trauma patients (ISS>15) from January 2013 to December 2015 were included. The primary outcome was the area under the ROC curve for TRISS and RISC using the expected and observed 30-day mortality. Results: 1864 patients were recruited. 67.2% was male and the median age was 60. The median ISS was 24 with 40% of patients with ISS>25. Low fall was the most common mechanism of injury, with head and neck being the most commonly injured body region. The 30-day mortality was 22.4%. The expected mortality was 20.0% using TRISS and 19.7% from RISC II. The AUC was 84.8% (CI 82.7 to 86.9) and HL test 63.2 (p<0.001) for TRISS. RISC II yielded a superior AUC of 89.6% (CI 88.1 to 91.2) and HL test of 78.9 (p<0.001). Subgroup analyses showed that both score performed worse for ISS 25 or above (AUC: TRISS 80.4%, RISC II 87.7%), age 80 or above (AUC: TRISS 80.6%, RISC II 82.9%), low falls (<2 m) (AUC: TRISS 81.7%, RISC II 85.5%), and significant head or neck injury (AIS 3 or above) (AUC: TRISS 83.1%, RISC II 87.7%). RISC II was significantly better than TRISS in all subgroups, except in age above 80 and low falls. Conclusions: RISC II was superior to TRISS in predicting the 30-day mortality for Hong Kong adult trauma patients with ISS >15. These results should be taken note when performing future audit or benchmarking exercises.

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Improving Emergency Department Trauma Care in Fiji- Implementing the Trauma Call System
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Background and Objectives: The trauma team process was recently implemented at the Colonial War Memorial (CWM) Hospital. This study audits the trauma call procedure at the hospital over a period of 12 months. Methods: Retrospective descriptive study of trauma calls from August 2015 to July 2016 at CWM Hospital, Suva. Data relating to patient demographics, time of presentation, time to team assembly and time to CT scan were extracted from the emergency department trauma call database. Disposition from the emergency department and status at hospital discharge was extracted from the hospital patient information system. Results: There were 38 trauma calls for 46 patients. 72% were male. 82% occurred when the CT radiographer was off site (4pm-8am) including 47% which occurred between midnight and 8 am. 52% patients were intubated, 43% went to ICU, 26% went directly to the operating theatre, 37% died. Benchmarks for time to trauma team assembly and time to CT scan were met in 50% of cases. Conclusions: This was a severely injured cohort of patients with a high mortality rate. The rate of missed calls was not assessed in this study. Time to CT scan could be improved with an onsite radiographer. Time to team assembly could be improved with trauma team training and early notification from pre-hospital providers. There is a need to continue to monitor and refine the trauma call process and to extend data capture to measure injury severity and outcomes.

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Surviving The Deadly Fang
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Background and Objectives: Damaged control resuscitation (DCR) focused upon early administration of blood products and immediate arrest of ongoing haemorrhage pharmacologically, followed by surgical intervention. We report a case of DCR applied in traumatic amputation of extremities of a patient secondary to crocodile bite which subsequently resulted as a life saving tool for him. Methods: A 35 years old local gentleman, was brought to our emergency and trauma department after he was bitten by a crocodile. As a result, he ended up with traumatic amputation at distal part of right thigh and partial amputation of right mid forearm. The amputated limbs left him with exsanguinating haemorrhage, in which tourniquet was applied above the amputee level at scene. Upon arrival of EMTS team, he was in hypovolaemic shock state and was given a pint of crystal which tourniquet was applied above the amputee level at scene. Upon arrival of the patient, the primary team was very shocked by the magnitude of the haemorrhage and immediately performed a damage control resuscitation. They administered an immediate 4 units of blood and blood components and 15 units of fresh frozen plasma with two units of platelets. After the above treatment, the patient was brought to theatre and a total of 4 units of PRBC, 4 units of FFP and 4 units of platelets were given. However, the patient developed a cessation of the arterial bleeding. Conclusions: A damage control resuscitation was performed and the patient was brought to the operating theatre. With the help of the plastic surgery team and the help of the rehabilitation team, the patient was able to walk with his daily activities with the help of prosthetic limbs. With the help of the plastic surgery team and the help of the rehabilitation team, the patient was able to work in his daily activities with the help of prosthetic limbs. The patient was discharged after 2 months of admission, and the patient was able to work in his daily activities with the help of prosthetic limbs.

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I Can't Breath!The Blocked Vessels Who Refused to be D-dimer Positive; Struggles of a Remote District Hospital to Proceed with Imaging in Central Borneo
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Background and Objectives: Submassive Pulmonary Embolism (PE) is often a diagnosis of exclusion. In a remote rural hospital where Computed Tomography (CT) is 4 hours away, this poses a bigger challenge. Well’s score and PERC rule are often used in PE flow charts. D-dimer is used to rule out PE in a low-pretest-probability patient. A low Well’s score with negative D-dimer is said to rule out PE. Methods: Case Review; We report a case of negative D-dimer patient who was positive for PE. Patient is a 49 year old lady with chronic anemia, history of left frontal haemangioma diagnosed 7 years ago in remission and a newly diagnosed uterine fibroid. Patient was well at home. She mobilized normally, did not consume contraceptive pills, did not have family history of blood dyscrasias, had no leg pain or swelling. She presented to us with sudden onset of breathlessness. She was tachypnoeic, tachycardic and her SpO2 was 87% under room air. Arterial blood gas showed hypoxemia. ECG and CXR were normal.Urgent bedside echocardiogram showed dilated right atrium, right ventricle and presence of McConnell’s sign. Bedside 2 point compression test was negative.Well’s score was low (1.5 points for heart rate of 120). PERC rule was unable to rule out PE hence D-dimer was done. However, D-dimer was negative. Patient was requested for CT Pulmonary Angiogram from a tertiary hospital. However, the request was rejected in view of low Well’s score, negative D-dimer and patient hemodynamically stable apart from the relative hypoxemia. Patient was referred to the radiology department multiple times by different disciplines before finally being accepted. CTPA done showed PE. Results: - Conclusions: In conclusion, CTPA is the gold standard to diagnose PE. Massive PE is easily accepted for imaging due to patient’s hemodynamic instability. Submassive PE is hard to diagnose without CTPA and a negative D-Dimer with low Well’s score do not exclude PE.

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A Rare Case of Spontaneous Thrombolysis Via Cardiopulmonary Resuscitation (CPR) in Cardiac Arrest
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Background and Objectives: Secondary ventricular fibrillations (VFib) is one of the many dreaded complications in acute myocardial infarction (MI). Studies have shown that, proper treatment of the acute MI itself or the adequate intervention when VFib occurs results in good prognosis for the patient. Methods: We present here a case of a 51 year old man who developed sudden onset of chest pain while travelling in a bus. Patient was brought to our centre and his ECG showed sinus rhythm with ST elevation I, aVL, V2-V5 and ST depression III, aVF. Patient was diagnosed as acute anterolateral MI. Patient was planned for thrombolysis when patient suddenly collapsed. Patient developed pulseless VFib and shock was delivered based on ACLS guidelines. Post one application of shock, cardiac monitor showed asystole, cardiopulmonary resuscitation (CPR) was commenced immediately. Patient regained consciousness after 2 minutes of CPR. Results: Subsequent ECG post CPR showed complete resolution of ST elevation and ST depression. No thrombolysis was done for patient. Patient was admitted in Cardiac Care Unit
and two days later underwent 2 stenting via percutaneous coronary angiography (PCI). Patient was discharged well. **Conclusions:** Secondary VFib should be anticipated in all cases of acute MI to ensure quick intervention. Immediate and rapid treatment of acute MI and tachyarrhythmias based on ACLS protocol improves prognosis of patient in cardiac arrest post acute MI.  

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**PO_MED_02_03**

**Clinical Predictors of Bleeding Esophageal Varices in the Emergency Department**

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**Background and Objectives:** Some authors have found that thrombocytopenia, splenomegaly and ascites are useful predictors of large esophageal varices in cirrhotic patients. We decide to see whether these factors could also be used to predict bleeding oesophageal varices in patients known to have chronic liver disease in the ED. **Methods:** A case record review was done of all patients admitted to the ED with upper GIT bleeding from esophageal varices for a period of 5 years. The criteria of thrombocytopenia, splenomegaly and ascites were applied retrospectively to these patients to see how accurately they performed in predicting bleeding esophageal varices. **Results:** Only 55% of patients had thrombocytopenia, whereas 45% had splenomegaly, and 27.5% had ascites. Combining thrombocytopenia with the presence of either ascites or splenomegaly did not improve the yield (only 40%) and only 6 patients had all 3 criteria. Twelve patients with bleeding varices did not have any of the criteria. **Conclusions:** Thrombocytopenia, splenomegaly or ascites is an unreliable predictor of bleeding oesophageal varices. Urgent or emergent endoscopy is still advocated to accurately diagnose bleeding oesophageal varices.  

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**PO_MED_02_04**

**A Comparison of the Aerogen Vibrating Mesh Nebuliser vs. a Standard Jet Nebuliser to Deliver Bronchodilators in Moderate to Severe Asthma in the Emergency Department—Interim Analysis**

Cloviz Rau¹, Samer Elkhodair², Michael Patterson³, Bobby Garcia¹, Tania Leaf¹, Giara Murphy¹, Ceris Tuckey¹, Harriet Walton¹

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**Background and Objectives:** The management of asthma in the UK is protocolised. Nebulised bronchodilators provide effective therapy for patients with the condition. Previous studies have demonstrated superior drug delivery with the Aerogen vibrating mesh nebuliser when compared to a standard jet nebuliser. We sought to investigate if delivering bronchodilators with the Aerogen nebuliser reduces the stay in ED, and reduces the number of admissions to hospital compared to standard jet nebulisers. **Methods:** The study was a randomised controlled trial investigating if delivering bronchodilators with the Aerogen nebuliser reduces the mortality and rate of hospital admissions. **Results:** The study was a randomised controlled trial investigating if delivering bronchodilators with the Aerogen nebuliser reduces the stay in ED, and reduces the number of admissions to hospital compared to standard jet nebulisers. **Conclusions:** A higher number of patients had immediate improvement with the Aerogen Solo Ultra.  

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**PO_MED_02_05**

**Ceftriaxone-induced Toxic Epidermal Necrolysis: a Case Report**

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**Background and Objectives:** Ceftriaxone is a third generation cephalosporin commonly utilized as an empiric antibiotic treatment option in the Emergency Department (ED). Its pharmacokinetic profile, spectrum of coverage and tolerability make it an attractive option for use in the ED. Although highly efficacious the safety profile of ceftriaxone is yet to be established in a broader sense. Short-term clinical trials and postmarketing surveillance have shown a very rare incidence of very serious skin reactions like toxic epidermal necrolysis (TEN). In this case report, researchers summarize a case regarding a 21 year-old female patient who developed TEN after treatment with a single dose of ceftriaxone for urinary tract infection. **Methods:** not applicable (case report) **Results:** not applicable (case report) **Conclusions:** TEN is a life-threatening adverse drug reaction can occur to use of a variety of drugs including ceftriaxone. Diagnosis is made clinically with the history of drug exposure, prodromal symptoms and characteristic sloughing skin lesions. Early diagnosis and prompt withdrawal of causative agents can significantly reduce the mortality rate. This case represents a fatal case of TEN, likely caused by ceftriaxone. The incidence of TEN induced by ceftriaxone is extremely rare, especially given the large volumes of ceftriaxone prescriptions dispensed and doses taken by patients. TEN are rare in cephalosporins, they should be considered as agents that can potentially cause TEN.  

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**PO_MED_02_06**

**Cerebral Venous Thrombosis as a Rare Adverse Drug Effect of Eliotrombogap in Refractory Primary Immune Thrombocytopenia: Case Report**

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**Background and Objectives:** Primary ITP is acquired immune thrombocytopenia due to autoimmune mechanisms leading to platelet destruction and underproduction that is not triggered by an associated condition. A new class of drugs, the thrombopoietin receptor agonists, has been developed for use in ITP which have high efficacy and are well tolerated. These act by stimulating the production of megakaryocytes and ultimately platelets in the bone marrow by binding to and activating the TPO receptor reserve. Eliotrombogap is a non-peptide TPO-RA that is administered as a once-daily pill. Eliotrombogap is generally well tolerated with rare side effects including thrombocytosis, thrombosis, and minor reactions (headache, gastrointestinal symptoms) and increased liver enzymes. Rare side effects include thromboembolic disease (6%), thrombosis (adults: 3%), portal vein thrombosis (2%). **Methods:** Case presentation: 36-year-old female patient presented to the Emergency department with headache, left hand weakness and focal tonic seizure involve the left arm and left side of the face. She is known case of refractory primary immune thrombocytopenia started on several therapies including steroids and IVIG before she was started on eliotrombogap 50 mg then later underwent splenectomy. The dose of eliotrombogap was increased to 75 mg because of multiple relapses. **Results:** On presentation, her platelet count was 363 × 10^9/L. CT scan was done which showed right cerebellar and right occipitoparietal hemorrhagic infarction venous etiology with right parietal superficial cortical vein thrombosis and partial non-occlusive superior sagittal sinus thrombosis. Eliotrombogap was stopped and the patient was started on clexane bridged to warfarin. She was admitted for six days then discharged with no residual neurological deficit. **Conclusions:** Eliotrombogap is a potent drug to treat refractory primary immune thrombocytopenia which can cause cerebral venous thrombosis as a rare adverse reaction.  

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**PO_MED_02_07**

**Abnormal Movements but Not Agonal Breathing Is a Concomitant Sign Associated with Shockable Initial Rhythm and Better Outcomes in “Sudden” Cardiac Arrest**

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Implementation of Electronic Medical Record and Its Downtime Effect in a Busy Emergency Department

Raheel Qureshi

Background and Objectives: To study the experience of electronic medical records (EMRs) implementation in a busy urban academic emergency department (ED) and to determine the frequency, duration, and predictors of EMR downtime episodes. Methods: This was a retrospective analysis of data collected in real time by an EMR and by the operations group at the study ED, during the 20-month period May 2016 through December 2017. The study center uses the First Net Millennium EMR (Cerner Corporation, Kansas City, Missouri USA). The ED operations data are downloaded weekly from the EMR and transferred to the analytics software Statata (version 15MP, Stata Corp, College Station, Texas USA). The data are analyzed using Stata software (version 15MP, Stata Corp, College Station, Texas USA). Results: In addition to standard recommendation, EMR prospectively recorded concomitant events. In addition to standard recommendation, EMR prospectively recorded concomitant events that lead to start of cardiopulmonary resuscitation (CPR) in 385 cases with EMS-witnessed out-of-hospital cardiac arrest (OHCA) during the period of April 2012 to March 2018. Detailed database was completed after additional interview to EMS personnel. After excluding 268 cases with impending cardiac arrest (severe consciousness disturbance, abnormal respiration or loss of radial pulse), 117 cases were analysed. Results: In addition to common signs for cardiac arrest, including unresponsiveness, loss of pulse, and apnoea or agonal breathing, the following signs were recorded as a concomitant signs which lead to start of BLS: abnormal movements of extremities and jaw which mimic tonic convulsion (17.9%), abnormal eye movement or position (3.4%), shock or groan (5.1%) and vomiting (5.1%). Agonal breathing was recorded in 29.1% (34/117) of all EMS-witnessed “sudden” OHCA cases and after cease of abnormal movements in 17.4% (22/126) of cases with abnormal movements. While abnormal movements were significantly associated with shockable initial rhythm (unadjusted OR: 95% CI, 4.39; 1.56–12.3) and better neurologically favourable one-year survival (5.11;1.87–14.0), agonal breathing was not associated with shockable initial rhythm (0.59;0.22–1.63) or neurologically favourable survival (0.45;0.14–1.44). Multivariable analysis including all concomitant signs and agonal breathing confirmed the results of univariate analyses: adjusted OR (95% CI) of abnormal movement, 5.45 (1.82–16.7) for shockable rhythm, 4.16 (1.40–12.3) for neurologically favourable one-year survival. Conclusions: Abnormal movements mimicking tonic convulsion are likely to be a concomitant sign associated with shockable initial rhythm and better outcomes in “sudden” cardiac arrest. Corresponding Author: Hideo Inaba (hidinaba@med.kanazawa-u.ac.jp)

Characterizing Agreement in Level of Inter-arm Blood-Pressure Readings of Adults in the Emergency Department (CALIBRATE Study)

Isma Qureshi

Background and Objectives: The CALIBRATE study aimed to measure the inter-arm blood pressure (IAD) differences in the patients presenting to the emergency department (ED) in the country and to assess the distribution of IADs in this population. Methods: In sitting position, two consecutive blood pressure (BP) measurements were recorded from the right and left arm for each participant using calibrated automated machine and appropriate cuff size. The data were recorded using predefined data fields including patient demographics, past medical, social and family history. The continuous variables were reported as mean (SD) or median (IQR) based on the distribution of data. The data was analyzed using Stata MP 14.0 (College Station, Texas). Results: A total of 1,800 patients, with mean age 34 (10) years, were prospectively recruited from the ED. The median absolute systolic BP difference (ASBP) between the right and left arm was 6 mmHg (3‒10) and it was same for the first (ASBP1) and the second reading (ASBP2). The absolute average of ASBP1 and ASBP2 was 7 mmHg (4–10). The difference in SBP of less than 20 mmHg for inter-arm blood pressure was seen in 95th percentile of the population. No meaningful association could be detected between the significant IAD and the study variables such as age, demographics, regions of interest and risk factors. Conclusions: In population presenting to the ED, the IAD of at least 20 mmHg reached at 95th percentile validating the known significant difference. The utility of SBP difference can be improved further by taking the average of two individual readings.

Time to Initial Physician Evaluation in Different Parts of the Emergency Department with Demographic Partitioning

Raheel Qureshi

Background and Objectives: In the Middle East, cultural and other factors (e.g. language) combine to dictate a degree of ED partitioning by demographics. The aim of this study was to assess patient time performance, from arrival in ED to initial evaluation by physician (tMD), in various areas of the ED partitioned by demographics. Methods: This study was a retrospective database analysis of 176,996 patients over a period of six months. Univariate and multivariate analysis was conducted between the met tMD target (dependent variable) and the three triage study areas (independent variable). The data was then incorporated into the statistical software package Stata (version 15MP, Stata Corp, College Station, Texas USA). Results: During the study period, total census was 208,377. There were 176,996 CTAS 3-5 patients eligible to be included in this study. The median age of study population was 31.6 years (25.0–41.0) and 124,707 (70.5%) were male. The overall tMD varied significantly between males vs. females (91 min vs. 79 min, p = 0.0001), adults vs. pediatrics (85 min vs. 52 min, p = 0.0001), and GCC vs. non-GCC patients (42 min vs. 115 min, p = 0.0001). Conclusions: The tMD was found to vary in different parts of the ED and appeared unrelated to patient acuity or ED operational stressors. Corresponding Author: Raheel Qureshi (rqureshi@hamad.qa)

Transition of a Middle Eastern Emergency Department to an Academic Physician Model Improves Patient Left-without-being-seen Rate

Isma Qureshi

Background and Objectives: Major endpoint for ED performance assessment is minimizing the LWBS proportion. The aim of this study was to assess previously unstudied aspect of LWBS to determine whether increasing the proportion of shift’s on-duty physicians who were trainees, had any effect on the shift’s % LWBS. Methods: Study was conducted at the urban-academic-ED (annual census: 452,757) over a period of one year. We employed multivariate linear regression (<0.05) defining significance to identify and adjust for myriad LWBS influences related to patient care. Results: As analyzed over 1098 shifts, the LWBS rate was 8.9% (IQR 5.3% to 13.5%). The LWBS was not adversely impacted by increasing trainee presence in the ED; the opposite was noted. In univariate analysis, the proportion of on-duty trainee physicians was significantly (p<0.001) associated with decrease in LWBS rates. The multivariate model that adjusted for the statistically significant and confounding LWBS influences, each increase of 1% (absolute) in trainee’s proportion of overall on-duty physician coverage was associated with absolute % LWBS decrease of 2.1% (95% CI 0.43% to 3.8%, p = 0.014). Conclusions: At the study site, partial replacement of board-certified specialist-grade EM physicians with EM residents and fellow trainees was associated with statistically and operationally significant improvement in LWBS. Corresponding Author: Isma Qureshi (iqureshi@hamad.qa)
Emergency Pericardiocentesis in Resources Limited District Hospital

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Background and Objectives: Cardiac tamponade is frequently undetected and undertreated in district hospital. Previously, pericardiocentesis was never been performed in our district hospital and suspected-cardiac tamponade patients especially non trauma patient would be transferred urgently to the nearest tertiary hospital due to lack of equipments and skills and most patient can’t make it to reach tertiary hospital. Here we reported and discussed on three cases of pericardiocentesis done in district hospital using ultrasound guided and central venous catheter set.

Methods: Reported three cases presented in one year period. Case 1: 61 years old gentleman, came to district emergency department with worsening dyspnea a day after he was discharge from medical ward in another main hospital which was treated for fluid overload. On arrival, patient was mildly tachycnephic, his BP 77/50 mmHg, HR 55 SPO2: 96% on room air, his jugular veins distended. Lungs was clear however clinically there is ascites and pedal oedema. Noted massive pericardial effusion on echo. Case 2: 40 years old gentlemen, brought by ambulance as patient was found unconscious in his car. On arrival, BP was unrecordable, heart rate 120. Noted moderate pericardial effusion but evidence of tamponade in echo. Also noted aortic root enlarged. Case 3: 78 years old gentlemen, underlying advanced lung cancer. Came to emergency room with complain of worsening dyspnea. Clinically in shock with distended neck veins. Apart from pleural effusion, there was evidence of pericardial effusion with tamponade effects. Results: We performed ultrasound guided parasternal and apical approach emergency pericardiocentesis using the affordable triple lumen central venous catheter set. One patient survived and discharged well. Two patients only survived within 48 hours. No immediate complication from all three patients. Conclusions: Ultrasound guided pericardiocentesis Seldinger technique using cheaper CVP triple lumen catheter can be performed safely in resources limited district hospital.

Managing the Bariatric Patient in the Emergency Department

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Background and Objectives: Management if the bariatric (morbidly obese) patient presents challenges to Emergency Medical Systems. With a global increasing incidence of obesity, particularly in industrialised countries, this is a worldwide problem. This paper reviews the published evidence regarding the altered physiology and anatomy in bariatric patients, and suggests practical alterations in management for easier care of our larger patients, particular as regards the primary survey (ABCs). Methods: Summary of the literature relating to the altered anatomy and physiology and management of the ABCs in bariatric patients, both with regards to illness and trauma, with a focus on practical options for the treating physician. Also discussed will be changes in pharmacokinetics with obesity, and the psychological component of morbid obesity and its implications for treatment in the Emergency Department. Results: Improved care of the morbidly obese with less clinician frustration and reduced potential for avoidable harm. Conclusions: Applying a Bariatric ABC can allow easier care of our largest patients.

A Comparison of RIPASA Score vs. Alvarado Score in the Diagnosis of Acute Appendicitis

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Background and Objectives: Acute appendicitis is a common surgical emergency. RIPASA and Alvarado scores are commonly used to improve diagnostic detection of acute appendicitis as well as decrease the use of CT scans. The authors felt that a comparative study between the 2 scores would be useful to determine the usefulness of the RIPASA scoring system vs. the Alvarado scoring system in a local context. Methods: This was a prospective, observational study of patients seen at the hospital’s Emergency Department with possible appendicitis identified after history and physical examination. Exclusion criteria were age < 16 or > 80 years, history of previous appendectomy, pregnancy and patients who were mentally or physically unfit to give verbal consent. Both the Alvarado and RIPASA scores were calculated and a study form was filled in by the attending clinician. The final diagnosis of acute appendicitis was confirmed by one of the following: histology post-surgery, contrast enhanced CT scan showing signs of acute appendicitis or absence of RIP pain during telephone follow up after 4 weeks. IRB approval was obtained for this study. Results: 106 patients were recruited. The area under curve for Alvarado and RIPASA were 0.60 (95% CI 0.49-0.71) and 0.62 (95% CI 0.50-0.73) respectively. Comparison of the two AUCs showed no significant difference (p=0.773). With a cutoff score of 7 (inclusive) for Alvarado and 7.5 (inclusive) for RIPASA, the positive predictive value (PPV) and negative predictive value (NPV) were: Alvarado (PPV 51.6%, NPV 63.2%) and RIPASA (PPV 58.8%, NPV 67.4%). Conclusions: Both Alvarado and RIPASA had AUC under 0.7 and therefore were below the clinically acceptable level for diagnosis of acute appendicitis. Neither score had a PPV or NPV above the clinically acceptable level of 70%. A useful score for the diagnosis of acute appendicitis still awaits discovery.

Optimal Cut-off Values of Troponin I in Diagnosing Myocardial Infarction in Patients with End-stage Renal Disease

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Background and Objectives: Patients with end-stage renal disease (ESRD) have higher risk of ischemic heart disease and have worse prognosis after acute myocardial infarction (MI). In diagnosing MI, cardiac troponin is a key test which can be easily used in emergency department. However, cardiac troponin levels are frequently elevated in patients with ESRD without evidence of acute MI. Thus, this study attempted to determine the optimal value of cardiac troponin in patients with ESRD. Methods: Clinical characteristics and laboratory tests of adult dialysis patients who visited emergency department of Ajou University Medical Center from January 2010 to May 2018 were retrospectively collected. Diagnosis of MI was made according to the fourth universal definition of type 1 MI. The cut-off values were calculated by Receiver operating characteristic (ROC) curve. Optimal cut-off value was determined by calculating Youden index. Results: Medical records of 1,144 patients were analyzed and MI was diagnosed in 82 patients (75 on hemodialysis; 7 on peritoneal dialysis). Optimal cut-off value of hsTnI was 131 ng/L with 81.71% sensitivity and 75.42% specificity. Area under the curve (AUC) was 0.877 (95% confidence interval CI 0.844-0.910). Optimal cut-off value of hsTnI in hemodialysis patients was 75 ng/L with 93.33% sensitivity and 60.70% specificity. AUC was 0.870 (95% CI 0.833-0.906). Optimal cut-off value of hsTnI in peritoneal dialysis patients was 144 ng/L with 100.00% sensitivity and 83.10% specificity. AUC was 0.943 (95% CI 0.893-0.992). Conclusions: The optimal cut-off value of hsTnI in diagnosing MI in patients with ESRD was 131 ng/L, which is higher than in general population. When analyzed separately, the optimal value of peritoneal dialysis group was much higher than in hemodialysis group, and sensitivities of each group were higher. Therefore, dialysis modality should also be considered when diagnosing MI in ESRD patients, and serial measurement is needed if clinically acute coronary syndrome is suspected.

Sorry Doctor, My Child Is Sleeping

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Background and Objectives: Stroke in children is an uncommon presentation seen at the Emergency Department. It is a diagnostic challenge during early presentation, especially in the younger age group. Clinical presentations will vary based on children’s age group and may not be as simple as the FAST acronym (Facial drooping, Arm weakness, Speech difficulties and Time to call emergency services) used in adults. Methods: This case report describes a 3 year old girl that presented with the clinical presentation of fever and cough. At triage, she was being carried and was comfortably asleep on her grandmother’s shoulders. She was triaged to green zone only to find out during clinical examination that the child had slurring of speech and left sided hemiplegia. Results: Recognizing this clinical
presentation is a challenge at triage and may often be missed resulting a delay in diagnosis or a missed/under diagnosed altogether. **Conclusions:** This case highlights the difficulties as well as importance of early recognition and diagnosis of acute hemiplegia in an emergency setting.

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**PO_PED_04_03**

**Toxicology–One Pill Can Kill**

Rodrick Lim

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**Background and Objectives:** This lecture will be a descriptive review of common but important medications that can harm a toddler with a single pill. Attention will be paid to classes of medications that can be lethal in small quantities. **Conclusions:** At the end of the lecture, participants should have acquired knowledge important to their daily practice, covering common toxicologic exposures to children that can be fatal.

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**PO_PED_04_04**

**Epidemiology of Pediatric Genital Injury in Korea**

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**Background and Objectives:** Genital injury is one of the common injury in children. However, there are no nationwide epidemiology data published in Korea. Therefore, we demonstrated demographic and clinical characteristics of pediatric genital injury in Korea. **Methods:** We retrospectively reviewed emergency department-based injury in-depth surveillance (EDIIS) registry which was collected in multicenter in Korea from 2011 to 2016. The final diagnosis of EDIIS registry were reviewed, and ICD-10 (international classification of diseases 10th version) code of S30.2, S31.2, S31.3, S31.4, S31.5, S37.3, T19.0, T19.1, and T19.2 were defined as genital injury. The demographic and clinical data of patients who were diagnosed as genital injury aged younger than 18 years were analyzed with descriptive statistics. **Results:** Among 1,537,617 cases of EDIIS registry, 3,151 cases were classified as pediatric genital injury. Median age of patients were 6 [Interquartile range 4-10]. Male patients were 1,656 (52.55%). 174 (5.52%) patients were transported by emergency medical services. Blunt injury (1,896, 59.31%) were most common mechanism of injury followed by fall and slip (668, 21.20%) and transport accident (256, 8.12%). About half of injury were happened at home (1,571, 49.86%). 1,633 (51.82%) of patients were diagnosed as contusion of external genital organs and 683 (21.68%) of patients were diagnosed as open wound (1,571, 49.86%). 1,633 (51.82%) of patients were classified as genital injury. The demographic and clinical data of patients who were diagnosed as genital injury aged younger than 18 years were analyzed with descriptive statistics. **Conclusions:** Most of pediatric genital injury are non-life threatening and can be discharged after treatment. None had died related to genital injury.

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**PO_PED_04_05**

**Should We Hospitalize Pediatric Patients with Intussusception After Successful Reduction?: a Systemic Review and Meta-analysis of Outcome**

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**Background and Objectives:** Pediatric patients with intussusception usually admission in the hospital for observation after successful reduction. There are some studies that showed no difference in complications after brief observation and discharge from the emergency department after uncomplicated ileocolic reduction. However, few studies include both inpatient and outpatient cohorts. We performed a systematic review and meta-analysis to compare recurrence rates and length of hospital stay between the groups. **Methods:** Studies published in English up to March 2018 were searched from Medline, Embase, Cochrane databases, using a combination of the terms ‘intussusception’, ‘admission’, ‘outpatient’, ‘discharge’, ‘post reduction’, ‘hospitalization’, ‘management’, ‘recurrent’, ‘practice’, and ‘resource utilization’. A meta-analysis of studies comparing outcomes after successful intussusception reduction in children between inpatients and ED patients was performed. **Results:** No randomized controlled trials (RCT) were found. Eight retrospective observational studies were included, comprising 546 inpatients and 434 ED cases. There was no statistical difference in overall recurrence rate between inpatients (8.4%) and ED (9.4%) (pooled risk ratio [RR] = 1.06; 95% confidence interval [CI] 0.70-1.61; p = 0.78; F = 0). Methods of reduction were air, barium, or other contrast enema. **Conclusions:** Discharge from the ED after uncomplicated reduction appears acceptable. However, evidence levels are low, and RCT should be performed to adequately evaluate the safety of outpatient management of pediatric intussusception.

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**PO_PED_04_06**

**To Identify the Relationship Between Body Temperature of Paediatric Patients on Initial Presentation to ED with ILI and the Eventual Diagnosis of Influenza a or B**

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**Background and Objectives:** Alice Ho Miu Ling Nethersole Hospital (AHNH) is an acute hospital with emergency department (ED) and pediatric ward. Patients with influenza-like-symptoms (ILI) will be admitted through the ED. Most will then receive nasopharyngeal swab to detect influenza. Our aim is to identify any link between those with influenza and their initial body temperature on presentation. **Methods:** It is a retrospective and observational study from 1/1/2017 to 31/3/2017. 1,548 patients were admitted to AHNH pediatric ward due to ILI. Their body temperature was checked and recorded by triage nurse with tympanic thermometer. Most of the patients received nasopharyngeal swab test for influenza after admission. We define the result is positive if they were confirmed having influenza A or B. The result is compared with the body temperature on presentation. **Results:** 1,302 patients were included. The exclusion criteria were those have taken antipyretic 4 hours before, the diagnosis of influenza was already made, re-attending cases within 48 hours, those without test performed either they refused, discharged before the test was performed or diagnosis other than ILI was suspected. 571 of them were tested positive according to the preset criteria. 295 of them have initial temperature at range of 38.6˚C-39.0˚C, 168 have temperature >39.0˚C, 71 of them have body temperature at range of 37.6˚C-38.0˚C, 32 of them have temperature range from 38.1˚C to 38.5˚C and 5 of them were afebrile. **Conclusions:** There is growing evidence favors early antiviral treatment for influenza especially for those who are at extremes of ages. However, the routine test takes hours before result available. In this study, it seems patients with body temperature (>38.6˚C) on presentation were more likely to have influenza infection. By identifying those patients, we can consider starting empirical antiviral treatment. This is more clinically relevant when there is access block to admission.

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**PO_IMG_02_01**

**Electrocardiography and Ultrasonography and Computed Tomography For Inferior Wall ST-segment Elevation Myocardial Infarction with Dissecting Aortic Aneurysm with Right Common Iliac Artery Occlusion**

Yueh-Hsing Lin

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**Background and Objectives:** We present a case of 50 year-old female patient with underlying Rheumatoid Arthritis. Present illness of initial syncope and loss of consciousness at home was told. Physical discomfort included chest pain and right lower limb numbness. Neurological exam of right Lower limb muscle power was 2, initially. Then right Lower limb muscle power was improved to 4, gradually. At triage, shock status (blood pressure: 74/37 mmHg) and tachycardia (heart rate: 110/minute) was noted. **Methods:** Electrocardiography (ECG) demonstrated ST-segment elevation (STE) on inferior lead with reciprocal ST-segment depression (STD) on anterior and lateral lead, indicative of Inferior wall ST-segment elevation Myocardial Infarction (STEMI). Cardiologist was consulted. However,
according to 2013 Rapid Ultrasound for Shock and Hypotension (RUSH) protocol, we use rapid bedside ultrasound for this patient. Ultrasoundography revealed a flap lesion in the abdominal aorta. The problem of pipe lesion was also suspected. Results: Computed tomography of brain excluded intracranial lesion. Computed tomography of chest and abdomen and pelvic confirmed the diagnosis of dissecting aortic aneurysm. Computed tomography also demonstrated type A dissecting aortic aneurysm with right common iliac artery total occlusion. Cardiovascular surgeon was consulted as well and operation was done smoothly. Patient had good outcome without neurological deficit. Conclusions: We present a series of images of a rare case of syncope with fluctuating right lower limb muscle power and initial shock status at triage. We use ECG for recognizing Inferior wall STEMI. We also use RUSH protocol for detecting the problem of pipe lesion. Computed tomography verified type A dissecting aortic aneurysm with involvement in right common iliac artery total occlusion. To avoid unnecessary inotropic agent for cardiogenic shock of this patient was emphasized as well.

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Ultrasound of the Lung as Diagnostic Tool: a Case of Misleading Clinical and Imaging Findings

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Background and Objectives: The presentation of pulmonary embolism may be elusive. A clinical diagnosis may be made with a set of symptoms. Even then, the presentation may not be obvious at the initial stage of presentation of the disease.

Methods: A 42-year-old lady with a background history of DVT and was on warfarin therapy, presented to Emergency Department complaining of mild shortness of breath and right-sided pleuritic chest pain. She was normotensive but tachycardic and the ECG showed sinus tachycardia. However, she appeared comfortable and SPO2 was 98% under room air. There was reduced breath sound over right lung. The arterial blood gas showed normal findings. No hypoaxia noted and the calculated A-a gradient was normal. CXR showed no lung markings on the right upper zone. Bedside lung ultrasound showed loss of sliding sign and loss of sea-shore sign (stratosphere sign) on right lung. However, lung pulse was present. There was also heaptazation and air bronchogram with ‘shred’ sign above the dia-phragm and a small amount of pleural effusion. Patient was treated as possible of having a bullae over right upper zone and bronchopneumonia. No chest tube was inserted. CT thorax was done subsequently confirmed the presence of bullae and bronchopneumonia. Results: From the history of presenting complaint, the provisional diagnosis was pulmonary embolism. However, from the clinical examination and after few basic investigations, the diagnosis of spontaneous pneumothorax was more appropriate. Fortunately, with the advantage of bedside ultrasound, the diagnosis of pneumothorax had been ruled out and chest tube insertion was deferred. Conclusions: Lung ultrasound can be useful to rule out as well as to rule in the right diagnosis. This case also highlights the importance of realizing the “small thing”, which makes a big difference such as presence of ‘lung pulse’, which prevents unnecessary chest tube insertion for the patient.

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Implementation of Emergency Department Smoking Cessation Service Utilising the 5As Framework: a Descriptive Study

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Background and Objectives: Smoking cessation service (SCS) has been introduced at health institutions in Singapore since the 1990s. Studies have suggest that Emergency Departments (EDs) can play a larger role in delivering public health interventions like SCS. The objective is to conduct a descriptive study on the implementation of an emergency nurse-pharmacist collaboration based on the 5As framework (ask-advice-assess-assist-arrange). To our knowledge, this is a first in the country. Methods: All patients who were admitted to the Short Stay Unit (SSU) in the ED of a tertiary public hospital were asked for smoking history, advised on interventions like SCS. The objective is to conduct a descriptive study on the implementation of an emergency nurse-pharmacist collaboration based on the 5As framework (ask-advice-assess-assist-arrange). To our knowledge, this is a first in the country. 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The Emergency Medicine Early Warning System—a Tool to Assist in the Detection Patient Deterioration

Fiona McDaid

Background and Objectives: Globally, increasing attendances at Emergency Departments and exit block has caused worsening delays for patients to be seen by clinicians. These delays cause an additional risk for patients; the risk of deterioration following triage but before being seen by the clinician. In an attempt to lessen this risk, Ireland has developed the Emergency Medicine Early Warning System (EMEWS) to improve the safety of patients where the number of patients waiting to be seen exceeds the ED’s capacity to see them within standard timeframes. EMEWS was developed by the National Emergency Medicine Programme (EMP) in conjunction with the Irish Department of Health. It was launched as a National Clinical Guideline in October 2018 by the Minister of Health and mandates that EMEWS is used in all EDs to aid recognition of and response to the deteriorating patient.

Methods: How does it work? Following Triage using the Manchester Triage System (MTS), all adult patients (≥16 years) are considered for inclusion on EMEWS. The triage category indicates the level of nursing review they should receive from the time of triage until they leave the ED to be discharged home or the decision to admit.

Conclusions: As their care needs are different, MTS Triage Category 1 and 5 patients are excluded. MTS Triage Category 3 or 4 patients who present with an isolated non-life or limb-threatening injury and who require no more than over-the-counter analgesia are also excluded. This enables appropriate concentration of resources on the care of patients who are the most acutely ill and most likely to experience physiological deterioration.

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Correlation of Environmental Factors and Injury Patterns in Ultrarunners: Experience From Oxfam Trailwalker Hong Kong

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Background and Objectives: An ultrarunning event is defined as any footrace longer than 42.195 km. Oxfam Trailwalker (OTW) was first organised in Hong Kong since 1981, as a fundraising event that run 100 km within 48 hours. It been a great challenge. The objective of this study is to evaluate the relationship with ambient air pollution and temperature with cardiovascular events. Whether they demonstrate clustering and fall into finite groups with intra-group similarities is unknown. We aimed to investigate the association between clusters of environmental parameters and acute myocardial infarction (AMI) occurrence in Singapore.

Methods: We performed a time-stratified case-crossover study on all AMI cases reported to the Singapore Myocardial Infarction Registry from 2010-2015. Exposure on days where AMI occurred were compared with the exposure on days where AMI did not occur. Using clustering methods, calendar days were grouped based on rainfall, temperature, wind-speed and Pollutant Standards Index (PSI). We fitted a conditional Poisson regression model with these clusters to daily AMI incidence. All models were adjusted for individual level characteristics. These findings have public health implications for AMI prevention and emergency health services delivery during haze.

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such as toxic chemicals, biological and radiounuclear agents. Spillage or leakage of these substances accidentally or intentionally can lead to catastrophic events.

**Methods:** We had a group of seven patients who presented to our Emergency Department with similar complaints following an explosion of a gas cylinder emitting yellow gas, at a scrap metal factory. The first patient was a 51 year old man with no known medical illness complaining of shortness of breath and foreign body sensation at throat. On examination he was noted to have signs of upper airway obstruction and was immediately intubated. A flexible scope performed by the ENT team showed significant laryngeal inflammation and swelling. The other six patients presented with similar symptoms and signs. Post decontamination, two of them were subsequently intubated and admitted to Intensive Care Unit. The rest were admitted for observation in the wards. All patients were discharged well after 2 days of treatment. The chemical substance involved was identified as Chlorine by the Fire Rescue Department. **Results:** HAZMATs incidence although not common, can occur due to the availability of the materials in our surrounding. Symptoms of hazardous chemical toxicity are usually rapid onset via inhalation and skin absorption. Decontamination of the patients and adequate personal protective equipment (PPE) are obligatory. HAZMAT Team from the Fire Rescue Department is an expert in identifying the chemicals involved and mass decontamination. **Conclusions:** HAZMATs awareness and knowledge on the approach to the management of the HAZMATs incidence are important to the medical personnel as first responder. Adequate preparations and joint trainings with the Fire Rescue Department are beneficial.

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**PO_ENV_01_07**

**Acute Kidney Injury After Near-Drowning in a Pool**

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**Background and Objectives:** Acute kidney injury (AKI) is a lesser-recognized complication in drowning. We present an unusual case of severe AKI in a haemodynamically stable young man who presented after a near-drowning (ND) incident.

**Methods:** A 35 year old male first presented to the Emergency Department (ED) after a ND incident. He struggled in a pool for less than 2 minutes with no loss of consciousness. He was haemodynamically stable in the ED with an oxygen saturation of 99% on room air. His chest x-ray was clear. He was discharged well on the same day. He attended another ED 3 days later complaining of feeling lethargic, nauseous and having a metallic taste in his mouth. His parameters were stable with an oxygen saturation of 98% on room air. His chest x-ray was clear. However, laboratory investigations revealed elevated creatinine of 1,065 μmol/L and elevated creatine kinase of 25,404 U/L. He was started on intravenous hydration and oral sodium bicarbonate after admission. Ultrasound of the kidneys showed increased renal echogenicity. His creatinine levels increased to a peak of 1,267 μmol/L 3 days after admission before improving. He was not started on dialysis. He was discharged well 9 days after admission with a creatinine of 152 μmol/L and creatine kinase of 103 U/L. **Results:** Most cases of acute kidney injury in drowning are in the context of severe hypoxemia with multi-organ involvement. Our literature search revealed that AKI in seemingly well victims of near drowning is often diagnosed after a delay of a few days from the initial event, due to victims presenting late or not being evident or picked up during the immediate medical visit post drowning. **Conclusions:** We suggest that for all ND cases, kidney function should be monitored for a few days after the initial event due to delayed manifestation of AKI.

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**PO_ADM_02_01**

**The Impact Of Service Quality Of International Emergency Services (Emergency Department) At Parami General Hospital, Yangon**

Myat Noe¹

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**Background and Objectives:** Service quality is the most important predictor of patient satisfaction. The purpose of this study was to investigate the impact of service quality on the overall satisfaction of patients in private emergency department, International Emergency Services (IES), Yangon. **Methods:** This study was conducted in 2017. The sample contained 72 patients and attendances who came to IES, Yangon. A survey questionnaire, data collection; containing 21 questions (17 questions about the service quality and 4 questions about overall satisfaction) and its validity and reliability were confirmed by using Smart Partial Least Square version 3.0. **Results:** This study found a good relationship between service quality and patient satisfaction. About 65.5% of the variance in overall satisfaction was explained by four dimensions of perceived service quality. The interaction quality has the greatest effects on the overall satisfaction followed by environment quality and the cost of the services, but not found a significant effect on the quality of the process quality on patient satisfaction. **Conclusions:** Study of service quality as a multifactorial concept builds clear the effective areas of service quality in establishing patient satisfaction. Supervisors can consider their quality improvement efforts on areas of service quality that have greater impact on patient satisfaction.

This study resulted that interaction quality had the most important positive effect on the overall satisfaction, and others are quite close to the positive effects. This study indicates the need for detecting the tariffs and upholding high standards in the service provisioning process. The supervisors and bosses of private hospitals and emergency rooms must define balanced prices in relation to the service quality. For the process quality, they must decrease the waiting time for the visits which is vital for people especially for Myanmar People. In addition, strengthening the interpersonal aspects of care and communication skills of doctors, nurses and staff should be focused.

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**PO_ADM_02_02**

**Characteristics of Patients Revisiting Emergency Department and Admitting to Hospital in Japan**

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**Background and Objectives:** Unexpected short term revisiting emergency department (ED) is accepted as a hospital performance index. However details of the revisiting Japanese ED are unclear. Japanese ED is newer and can be more immature than North American ED. So the information about revisits may help Japanese ED grow up. Objective of the study is to research characteristics of patients revisiting ED and admitting to hospital in Japan. **Methods:** We conducted a retrospective single-center observational study by medical records of targeted patients visiting Aizawa Hospital ED and not admitting from April 1, 2018 to September 30, 2018. We divided the patients into two groups and did a comparative investigation. One group which was named “Revisit-group” was patients who revisited ED and admitted to the hospital within 7 days after first visit. The other group which was named “non-Revisit-group” was patients who did not revisit or patients who revisited ED but did not admit within 7 days after first visit. Outcome was age, sex, high triage level in first visit (Blue or Red), ways of first visit (Walk-in or non-Walk-in), examinations by emergency physicians in first visit, and visits on weekends in first visit. **Results:** The number of targeted patients was 14,116. The number of non-Revisit-group was 13,844 (98.1%) and the number of Revisit-group was 272 (1.9%). Age (75 vs. 50 p<0.01), sex (male: 44.3% vs. 51.6% p: 0.017), and high triage level (24.6% vs. 15.8% p<0.01) were significantly different between two groups. **Conclusions:** Revisit-group had some characteristics. And when we examine patients who have them, we should be more careful.

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**PO_ADM_02_03**

**Validity of Canadian Triage and Acuity Scale and South African Triage Score in Emergency Patients in Cameroon**

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**Background and Objectives:** Standardized triage tools to prioritize emergency patients have never been validated in Cameroon. Our aim is to assess the validity of Canadian Triage and Acuity Scale (CTAS) and South African Triage Score (SATS) in emergency patients in Cameroon. **Methods:** We performed a prospective observational study at a specialized emergency centre, which has used CTAS since 2015, in Yaoundé, Cameroon. We triaged all patients who visited the centre from 6th to 13th of October, 2018 using both CTAS and SATS. We calculated
sensitivities, specificities, positive predictive values (PPV), and negative predictive values (NPV) for the need of life-saving interventions within an hour upon arrival when the cut-offs were CTAS level 1 (A), CTAS level 2 (B), SATS Red (C), and SATS Orange (D). Disposition from the emergency centre was followed up. Results: Of the 161 patients, most (88.2%) were between the ages of 11 and 70. Seventy-nine (49.3%) were women, and injury was the presenting symptom in 72 (44.7%). CTAS categorized 16 (9.9%), 64 (39.8%), 68 (42.2%) and 13 (8.1%) as level 1, 2, 3, and 4, respectively, while SATS classified 34 (21.1%), 57 (35.4%), 57 (35.4%) and 13 (8.1%) as Red, Orange, Yellow, and Green, respectively. Nineteen patients received at least one life-saving intervention within an hour upon arrival. The sensitivity and specificity, PPV, and NPV for the need of life-saving interventions were: 47.4%, 88.5%, 56.3%, 84.4% for A; 100%, 57.0%, 23.8%, 100% for B, and 68.4%, 70.8%, 38.2%, 89.5% for C, 100%, 49.3%, 20.9%, 100% for D, respectively. Among the six patients who died at the centre, all were level 1 in CTAS, and 4 (66.7%) were Red in SATS. Conclusions: The second highest levels of both CTAS and SATS have high sensitivities and negative predictive values in identifying patients requiring life-saving intervention within an hour upon arrival.

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Workforce Planning and Sustainability in a Central London Emergency Department

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Background and Objectives: The Emergency Department at Chelsea & Westminster Hospital (London, UK) is a busy urban centre, with average attendance of 135,000 patients per year. The National Health Service in the United Kingdom is under mounting stress, through increasing attendances and high staff vacancy rates. Emergency medicine relies upon a motivated and reliable workforce to provide safe, high-quality patient care. Our objectives were to develop new and innovative ways to recruit and retain staff. Methods: The strategy that we used was: - Development of innovative fellowships within the emergency department. - bespoke job planning and training, a new concept in medicine in the UK. - Development of individualised rota’s for the registrars and consultants, allowing work-life balance to be taken into account whilst maintaining service provision. - Development of new initiatives to promote staff well-being and morale. Results: Through sustainable and targeted strategies we have been able to recruit and retain a large workforce for our department. This has reduced the department’s reliance on locum (temporary) staff which are traditionally much more expensive than substantive staff. In addition, this has enabled further investment in substantive posts. Conclusions: A strategy of aggressive recruitment is essential to maintain a robust workforce, however this is the first step. We need to create a sustainable workforce that operate as high performing team, as empowered to seek personal and professional development, and have work-life balance aligned with their needs. To achieve this we need to open to new job designs, including partnering with other specialties and disciplines, to attract and retain candidates within our departments.

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Over-triage Occurs When Considering the Patient’s Pain in Korean Triage and Acuity Scale

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Background and Objectives: The Korean Triage and Acuity Scale (KTAS) was developed based on the Canadian Emergency Department Triage and Acuity Scale. In patients with pain, to determine the KTAS level, the pain scale is considered; however, since the degree of pain is subjective, this may affect the accuracy of KTAS. The purpose of this study was to evaluate the accuracy of KTAS in predicting patient’s severity with the degree of pain used as a modifier. Methods: A retrospective observational cohort study was conducted in an urban tertiary hospital emergency department (ED). We investigated patients over 16 years old from January to June 2016. The patients were divided into the pain and non-pain groups according to whether the degree of pain was used as a modifier or not. We compared the predictive power of KTAS on the urgency of patients between the two groups. Acute area registration in the ED, emergency procedure, emergency operation, hospitalization, intensive care unit admission, and 7-day mortality were used as markers to determine urgent patients. Results: Overall, 16,716 patients were included in the study, with 8,919 (53.4%) in the pain group. The proportions of patients with KTAS 1-3 were 62.3% in the pain and 75.6% in the non-pain groups. Among patients with KTAS 2-3, the proportion of urgent patients was higher in the non-pain group than the pain group (p<0.001). The odds ratios for urgent patients at each KTAS level revealed a more evident discriminatory power of KTAS for urgent patients in the non-pain group. The predictability of KTAS for urgent patients was higher in the non-pain group than the pain group (area under the curve; 0.766 vs. 0.842, p<0.001). Conclusions: Considering the degree of pain with KTAS led to overestimation of patient severity and had a negative impact on the predictability of KTAS for urgent patients.

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Frequency and Appropriateness of Intravenous Fluid Use For Hemodynamically Stable (HD) Triage Level 3 and 4 Patients in the Mafraq Hospital Emergency Department

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Background and Objectives: The global demand for Emergency Department (ED) services is increasing, and ED overcrowding is becoming a multifactorial dilemma. Inappropriate ED service use interrupts the provision of services for those in genuine need. Moreover, this inappropriate use adds to health-care personnel’s workload, increases cost, and ultimately increases ED length of stay (LOS). We hypothesized that IV fluids are overused in the ED, mainly in patients classified as triage level 3 (T3) and level 4 (T4). Methods: This retrospective chart review assessed the frequency and appropriateness of IV fluid use in adult HD stable T3 and T4 patients (>16 years) in ED from 1/12/15 to 31/5/16, and 1/7/17 to 31/12/17, who were discharged. Appropriate use of IV fluids was defined from the published literature and our own clinical experience. Primary outcome was the percentage of appropriate use of IV fluids in HD stable T3 and T4 patients and after implementing an abbreviated list of IV fluid indications. Results: Survey of 28 ED physicians (76% response rate) revealed that 64% of them prescribed IV fluids with no medical indications and the same rate thought that IV fluids were overused in ED. Chart review of total 721 in period 1 and 2 showed that an appropriate use of IVF was approximately 37% for T3 and 36% for T4, a rate that is similar between period 1 and 2, which was the study primary outcome, with four planned secondary outcomes. Conclusions: The data demonstrated an overuse of IV fluids in our ED in patients triaged as T3. The main reasons for this overuse appear to be due to patient demand and expectations. We believe that developing a structured educational program for the ED in addition to patient education may help change this culture of demanding IV fluid therapy.

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Quality Improvement Project: Using NASA Techniques in the Paediatric Emergency Department to Reduce Complaints, Increase Patient Safety and Improve Morale Amongst Junior Doctors

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Background and Objectives: The system for chasing investigations in our Paediatric Emergency Department is insufficient and led to formal complaints by parents. Chase jobs had no impact on patient care and removed trainees away from tasks more suited for training. An informal survey amongst trainees dealing with the chase list showed reduced morale and job satisfaction. Our aim was to create a leaner and safer system resulting in fewer complaints, more time for training, and teaching and improved morale. Methods: Chase lists from September 2017 to August 2018 were retrospectively analysed. 3 chase jobs potentially putting patients at risk, not having impact on patient care or taking up a trainee’s time inappropriately were selected: 1) chasing blood culture results for patients not discharged on antibiotics, 2) chasing throat swabs for patients discharged on Penicil-
Comparison of Body Water Status Between Patients with Non-septic Infection and Patients with Sepsis Using Bioelectrical Impedance Analysis

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Background and Objectives: This study was designed to compare the water status between patients with simple infection and patients with sepsis using bioelectrical impedance analysis and correlate the body water status with the prognosis of sepsis patients. Methods: A prospective study in a single emergency department was performed. Adult patients suspected of sepsis and non-septic infection were enrolled. Bioelectrical impedance analysis (InBody S10) measuring total body water (TBW), intracellular water (ICW), and extracellular water (ECW) was applied to the sepsis patients at three periods: Before, immediately after, and 1 hour after fluid bolus. Results: Patients with sepsis (n=38) tend to have an average of 51 mL/kg TBW deficits compared to simple infection (n=10) (p=0.06). The ICW was significantly different between groups (p=0.02), while the ECW was not significantly different (p=0.30). The ratio of ECW to TBW (ECW/TBW) was significantly higher in patients with sepsis than non-septic infection. Compared to non-survivors, ECW/ICW showed a tendency to be decreased after fluid bolus in survivors which was significant in 1 hour after fluid bolus. Conclusions: The body water status and its deficit were evaluated in septic patients with the bioelectrical impedance analyzer. The ICW was significantly lower in patients with sepsis and the ECW/ICW after fluid bolus was significantly higher in non-survivors.

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Novel Methods of Measuring Pain in the Emergency Department - the BOP Project

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Background and Objectives: Pain documentation in Australian emergency departments (EDs) is neither common nor consistent, due to the low prioritisation of pain measurement and management, even though it impacts patients in their ED experiences and treatment of underlying conditions. Our first objective was to characterise the trend and impact of current pain scoring trends alongside patterns of analgesic administration and durations of stay; then to develop a method that depicts pain score trends over extended periods of time, incorporating both severity and duration, to universalise the quantification of acute pain in EDs. Methods: We proposed that the Burden of Pain (BOP), represented by the area under the curve (AUC) of sequential, timed pain scores, could enable efficient and appropriate management of patients’ pain. The study comprised retrospective and prospective portions; analysis of Cerner FirstNet® for all adult patients presenting with acute pain, in designated 6-hour periods over 5 days of the week. The 2nd part involved recruiting a convenience sample of adult patients in pain and conducting serial pain scoring at 0.5-hour intervals over the same designated 6-hour periods over the same 5 days of another week (12th–17th September 2018). Results: There were 102 patients identified in the retrospective, control group and 41 in the prospective, test group. The median number of pain scores obtained in the control group was 0, and only 19 patients (18.63%) showed a median time to first pain score of 30 minutes. Time To Analgesia (TTA) patterns were incomplete in many medication records, but what was available showed TTAs that exceed nationally recommended timeframes. Conclusions: Higher pain scoring frequencies in our test group, with a median of 7 pain scores obtained per patient, suggested that our novel metric of generating pain score curves displays strong potential in becoming a universal metric for measuring and describing pain trajectories.

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Risk Factors of Gram Negative Aspiration Pneumonia in Drug Poisoned Patients

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Background and Objectives: Given these differences of a variety of patient factors and the settings where aspiration occurs, it seems helpful to evaluate microbiological aspects of aspiration pneumonia after acute poisonings, thereby the spectrum of appropriate antibiotics can be narrowed. Therefore, we performed this study to determine the microbial etiology of aspiration pneumonia in patients with acute poisonings. Methods: We conducted this retrospective observation study between January 2014 and December 2017 at a 1,400-bed, tertiary care, university-affiliated hospital. We analyzed the results of sputum culture of the adult patients (≥18 years old) who presented to our ED with poisoning. Results: Of the 526 patients presenting to the ED with poisoning, 325 patients who had no sputum culture were excluded. Of the remaining 201 patients, 23 with poor quality of sputum culture and 46 without predominant microorganism in culture were also excluded. Overall, 132 patients had isolated predominant microorganism from sputum culture: 48 had one GNP, 63 had one GNP, 4 had two GNPs, 13 had mixed pathogens (one GPP and one GNP), and 4 had fungi (Candida albicans). Four patients who had isolation of Candida albicans were excluded because growths of same fungi were not observed in blood cultures. Finally, a total of 80 (62.5%) had at least one GNP (classified as GNP group) and 48 (37.5%) had only GPP (GPP group). Between two groups, only initial sPO2 was significantly different (p<0.015). Conclusions: The drug poisoned patients with low sPO2 in the emergency department should given the antibiotics targeting gram negative bacteria when aspiration pneumonia is suspected.

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Multicultural Presentation of Chest Pain at an Australian Emergency Department

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Background and Objectives: To investigate differences in clinical presentation and outcomes between Culturally And Linguistically Diverse (CALD) and non-CALD chest pain patients presenting to a large Australian metropolitan Emergency Department Methods: Extraction and linkage of two weeks of administrative and clinical data from ED FirstNet®, Hospital PowerChart® software and paper records analysed using R v3.5.1. Main outcomes included: ED patient epidemiology, degree of illness described by triage observation values, diagnostic and imaging investigations, medication use, ED discharge diagnosis, length of stay (LOS). The times between the patient’s ED arrival to when they first saw an ED doctor, had diagnostic and imaging investigations ordered and medication administered were also measured. Results: There were 158 (61.24%) CALD and 100 (38.75%) non-CALD patients. CALD patients had a significantly (p<0.0001) longer ED LOS than non-CALD patients (median 278.5 vs. 263 min). Overall, CALD patients were older (p<0.0001), presented with more abnormal vital signs at triage (p<0.0001), received more frequent diagnostic and imaging investigations, and faster medication administration than non-CALD patients. Conclusions: This pilot study found differences in many aspects of chest pain presentation between the two patient groups. CALD patients were older, presented with more abnormal vital signs at triage, received more frequent diagnostic and imaging investigations, received more rapid medication and stayed longer in the ED than non-CALD patients. A longer study duration with greater recruitment numbers would greatly add to the limited literature on this topic.

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Background and Objectives: The presentation of a hypotensive patient with epigastric pain generating myriad differentials, ranging from aortic dissection and pancreatitis to inferior wall AMI. We present an unusual diagnostic challenge of a lady presenting with epigastric pain mimicking of STEMI (“pseudo-STEMI”), despite normal coronaries during coronary catheterization or no histological evidence of myocardial coagulation necrosis during autopsy. Possible mechanisms described in the literature to explain transient ST-elevation changes in pancreatitis include hemodynamic instability affecting coronary perfusion, hypocalcemia, coronary vasospasms, hypercoagulable state as part of SIRS and vagal cardiobiliary reflexes leading to myocardial depression. Pancreatic proteolytic enzymes like trypsin can also directly damage the myocyte membrane. Four had STEMI and pancreatitis concurrently, presumably because pancreatitis can cause multi-organ failure including AMI. No published case reports had STEMI with falsely elevated amylase/lipase, which was the eventual outcome in this case. This could be attributed to publication bias. This case illustrates that elevated amylase should not fox one to delay transfer to cardiology catheterization or commit prematurely to a diagnosis of pancreatitis. Conclusions: While pancreatitis may be associated with pseudo-STEMI, the patient will still require urgent coronary catheterization regardless. Avoid the use of thrombolytics, contrast or heparin. Use lipase instead of amylase in such equivocal cases and consult both Cardiology and Surgery early.

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Incidence and Risk Factor of Post-contrast Acute Kidney Injury Following CT Angiography For Clinically Suspected Acute Pulmonary Embolism in the Emergency Department

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Background and Objectives: Despite the widespread use of computerized tomography pulmonary angiography (CTPA) with contrast media for the diagnosis of acute pulmonary embolism, a high level of evidence for its use considering post-contrast acute kidney injury is lacking. So, we investigated to confirm whether the level of estimated glomerular filtration rate (eGFR) presented in emergency department is significantly associated with post-contrast acute kidney injury occurrence in patients with CTPA. Methods: We conducted a retrospective observational study using automatically collected by Clinic Data Retrieve System with 1300 patients underwent CTPA for suspected acute pulmonary embolism in the emergency department. Univariate analyses were performed to identify significant risk factors for post-contrast acute kidney injury which was primary outcome, and multivariate logistic regression analysis was used to confirm the effect of eGFR presented in the emergency department on post-contrast acute kidney injury occurrence. Results: Total 41 (6.49%) patients were defined as post-contrast acute kidney injury to inferior wall AMI. We present an unusual diagnostic challenge of a lady presenting with epigastric pain mimicking of STEMI (“pseudo-STEMI”), despite normal coronaries during coronary catheterization or no histological evidence of myocardial coagulation necrosis during autopsy. Possible mechanisms described in the literature to explain transient ST-elevation changes in pancreatitis include hemodynamic instability affecting coronary perfusion, hypocalcemia, coronary vasospasms, hypercoagulable state as part of SIRS and vagal cardiobiliary reflexes leading to myocardial depression. Pancreatic proteolytic enzymes like trypsin can also directly damage the myocyte membrane. Four had STEMI and pancreatitis concurrently, presumably because pancreatitis can cause multi-organ failure including AMI. No published case reports had STEMI with falsely elevated amylase/lipase, which was the eventual outcome in this case. This could be attributed to publication bias. This case illustrates that elevated amylase should not fox one to delay transfer to cardiology catheterization or commit prematurely to a diagnosis of pancreatitis. Conclusions: While pancreatitis may be associated with pseudo-STEMI, the patient will still require urgent coronary catheterization regardless. Avoid the use of thrombolytics, contrast or heparin. Use lipase instead of amylase in such equivocal cases and consult both Cardiology and Surgery early.

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Effect of Titrated Positive End Expiratory Pressure (PEEP) on the Quali Static Pressure–volume (P-V) Loop vs. Low PEEP in Patients with Acute Respiratory Distress Syndrome

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Background and Objectives: The strategy on ventilator of the lung of patients with ARDS recommendation of ventilation with low tidal volume about 6 mL/kg predicted body weight so well, however PEEP titration is more controversial. We evaluated titrated PEEP on the static P-V loop according to decreases 28 day mortality and the best respiratory-system compliance of patients with moderate to severe ARDS compared with conventional low-PEEP strategy. Methods: All patients with ARDS seen at the ED Bach Mai hospital, onset<72 hours after ARDS between 2017 and 2018 were enrolled in a cohort study. Patients were randomized to titrated PEEP group (n=20) or low-PEEP strategy in ARDS network protocol group (n=20). Patients used sedation and neuromuscular blocking agents when no spontaneous breaths. Titrated PEEP group treated using PEEPfinder had quasi-static IVF tool and set PEEP above lower inflection point 2 cmH2O. Results: Mortality at day-28 (50% titated PEEP vs. 70% low PEEP, p=0.154, log rank test). Compared with the low PEEP strategy group, the PEEP titrated strategy group increased PEEP in day-1 (15.8 vs. 12.45±0.001) but no difference in day-4 managed significant PaO2/FiO2 in day-3 (182.75 vs. 131.28, p=0.03), higher compliance (day-1: 27.5 vs. 26.25 P=0.03). There were no significant differences in the risk of barotrauma. Conclusions: In patients with moderate to severe ARDS, a strategy titrated PEEP compared with low PEEP was decreased 28-day all-cause mortality (no significant differences), higher PEEP, increased PaO2/FiO2 and increased lung compliance.

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Ventilation Analysis of Portable Ventilator Models in Virtual Reality Ambulance Simulation

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Background and Objectives: The purpose of the study is to investigate the effective ventilation delivery that affects the rate of resuscitation Methods: The National Fire Service Academy conducted Virtual Reality (“VR”) based ambulance simulations from April 17, 2018 to April 28, 2018. The mean and standard deviations of mean ventilation and airway pressure were analyzed using descriptive statistics, and ANOVA and SPSS software 12.0 (SPSS Ins., Chicago, IL, USA) program. Results: When VR-based intubation was performed, the ventilation was 427 mL from Oxylator EM-100, 458 mL from MicroVenT CSI-3000 and 305 mL from O. When tracheal intubation was performed on the VR base, Oxylator EM-100 showed 10.623 cmH2O, MicroVenT CSI-3000 showed 11.291 cm H2O and OXY-LIFE II showed 6.965 cm H2O. When tracheal intubation was performed on the VR base, Oxylator EM-100 and MicroVenT CSI-3000 showed adequate ventilation and airway pressure. Conclusions: This study suggests to use an oxygenator as an efficient ventilation method after intubation in ambulance during transport. Skilled practice and the method of use of resuscitor is very important.

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Background and Objectives: When chest compression is performed with two hands in a situation where the movement of the vehicle cannot be predicted, the hands-off time increased resulting in inadequate chest recoil. Results: The results of Lucas (LUCASTM) and manual cardiopulmonary resuscitation of VR-based state showed better chest compression and less incomplete...
Installation Criteria Derived From Delivery Time of Automatic External Defibrillators at Apartment Houses

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Background and Objectives: By studying the actual conditions of the automatic external defibrillators installed at apartment houses, this study proposes installation criteria and management proposal for effective public access defibrillation for arrests that occur at home. Methods: As the correlation between the number of households, automatic external defibrillators and the installation distance were predicted, and was judged to have an effect on the automatic external defibrillator delivery time, regression analysis was performed. For the delivery time, actually measured distance via an application was put through conversion of time based on the quick adult pace standard, and the waiting time was also taken into consideration for the number of floors at the apartments in using a conversion based on low speed elevator standard. The number of households with less than 3 minutes of delivery time were derived from the regression formula to propose number of households for automatic external defibrillator installation criteria. Results: With intercept of 274.190, slope of 0.106, and each shown to be statistically significant (p < .001), the derived regression equation was $Y = 274.190 + 0.106X$. Calculated as number of households $= 274.190 + 0.106 \times 180$ (seconds) = 293, the automatic external defibrillator installation criteria for apartment houses came out to be 293 households, in order to obtain automatic external defibrillator delivery time of less than 3 minutes. Conclusions: Rational installation criteria of apartment house automatic external defibrillator was proposed to make quick defibrillation possible. It will be able to increase the survival rate of cardiac arrest patients within homes and will also be possible to apply the installation criteria to other multi-purpose facilities.

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Comparison Between Standard and Half-kneeling Cardiopulmonary Resuscitation

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Background and Objectives: This study seeks to propose a position in conformity with the latest basic CPR guidelines which emphasizes chest compression, via comparison of standard cardiopulmonary resuscitation and half-kneeling CPR. Methods: 16 participants performed four of each 30:2 conventional CPR and compressions-only CPR on standard position, kneeling on both sides and also performed four of each 30:2 conventional CPR and compressions-only CPR on half-kneeling position. 10 cycles in 30:2 conventional CPR and 300 times of chest compression in compressions-only CPR were performed. Comparison of every 64 cases of the four types of cardiopulmonary resuscitation output (short print out compression in compressions-only CPR, incorrect chest compression position and insufficient compression dilation were evident. More specifically, the incorrect chest compression position and insufficient compression dilation in half-kneeling compressions-only CPR appeared in the heavy group and the small group. Conclusions: There were incorrect chest compression positions and insufficient compression dilation in half-kneeling compressions-only CPR when they were heavy in weight or short in height. More proficiency is needed in the half-kneeling compressions-only CPR training in the area of chest compression position and compression dilation.

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Comparison of Knowledge and Performance After Cardiopulmonary Resuscitation Training at 3, 6, 9 Months

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Background and Objectives: The purpose of the study is to verify the retention period of knowledge and performance when the attitude education was carried out along with basic cardiopulmonary resuscitation knowledge and performance education. Methods: With 256 students from University received a 30 minute lecture and a 30 minute practice by non-feedback mannequin (Actor 911 SquadronTM, Vital Signs, New Jersey, USA). Starting in March, May, September of 2015 to December 2015, February, June of 2016, a survey was conducted for a total of 5 times including pre and post basic cardiopulmonary resuscitation training as well as 3 additional times in 3 month interval. Results: In knowledge (episol, 0.891) statistically significant difference (p < 0.001) was evident and therefore Bonferroni was applied for ex post analysis. Compared to the knowledge score from post education, there was a difference in score at 3, 6, 9 months post education, however there were no difference between 3, 6, 9 months. In other words, knowledge was retained for at least 9 months post education per the self-assessment. In performance (episol, 0.831) statistically significant difference (p < 0.001) was evident and therefore Bonferroni was applied for ex post analysis. Conclusions: The study confirmed that by adding attitude education to basic cardiopulmonary resuscitation training, knowledge and performance were retained for at least 9 months. This result is considered to have displayed longer retention period among related studies and it can be said that the decay period for knowledge and performance were delayed by adding attitude education.

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Paramedic Experiences Working with People Who Have a Mental Illness: a Qualitative Inquiry

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Background and Objectives: To investigate paramedics’ experiences of caring for people with mental illness and how those experiences potentially influence patient care. Methods: A qualitative research design using focus groups for data collection. Two focus groups were conducted, each comprising three Australian paramedics. Qualitative research using focus group data and a thematic analysis was undertaken on the focus group material. Emergent themes were derived and used to inform a model for improving the care that paramedics provide to people with mental illness. Results: Paramedics have varying experiences when caring for people with mental illness. They are empathetic towards the circumstances of the person with mental illness. They perceive that stigmatisation of persons with mental illness occurs in some circumstances. Paramedics are also affected in their clinical decision making by the training and education they have received in regards to, the behaviour of the patient with mental illness and by cultural influences of the profession. Conclusions: Stigmatisation of people with mental illness is apparent in paramedic practice. Despite mental illness being a common presenting problem, paramedics feel under prepared and have difficulty in treating these people. The behaviour of the patient can often be a reflected in the behaviour of paramedics. The impact of ‘burnout’ due to high exposure to people with mental illness especially in metropolitan areas, may lead to decreased levels of empathy and compassion. Keywords: paramedicine, mental illness, stigma, symbolic interactionism

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The Survey of Thai Paramedics’ Recognition in Performing Advanced Procedures

Thongpatik Huabangyang
Management of Sepsis in Chinese Emergency Departments: A Cross-sectional Study Involving 51 Hospitals

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Background and Objectives: Delayed patient admission to the intensive care unit (ICU) from the emergency department (ED) is common in China. Thus, early management of sepsis are usually carried out in ED, which is of vital importance in the successful treatment of sepsis. This study aimed to investigate the situation of management for sepsis in Chinese emergency departments. Methods: Patients with sepsis admitted to the ED from February 15 to August 14 in 2018 were respectively identified from a Chinese clinical database. The length of stay in ED, the time from ED arrival to initiation of antibiotics, blood culture, lactic acid and ScvO2 measurement, fluid resuscitation and the outcomes were obtained. Results: A total of 1,003 patients were included for analysis, including 821 survivors and 182 non-survivors. The length of stay in ED was 16.3 ± 8.7 hours. The proportion of subjects starting antibiotic use in 1, 3, 6 hours after ED admission was 57.8%, 92.7%, and 99.2%, respectively. The proportion of subjects taking blood culture in 1, 3, 6 hours was 19.6%, 26.7%, and 31.9%, respectively. The proportion of subjects with first monitor of lactate acid in 1, 3, 6 hours was 50.7%, 55.9%, and 58.0%, respectively. The proportion of subjects with first measurement of ScvO2 in 1, 3, 6 hours was 10.5%, 11.9%, and 12.8%, respectively. The proportion of subjects that the initial fluid resuscitation with 25-35 mL/kg fluid administered in 1, 3, 6 hours was 11.7%, 62.9%, and 76.8%, respectively, and the total volume administered was associated with the use of bedside ultrasound. Conclusions: The study showed that the early management of sepsis was suboptimal in China. More attention should be paid to the management of sepsis in Chinese ED.

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Background and Objectives: Pyrometra is a condition of disease that a pus collection occurs in uterine cavity. Spontaneous perforation of pyometra is very rare case. We encountered fatal mortality case of pyometra. Methods: A 80-year-old woman was transferred from other regional hospital with severe abdominal pain. On physical examination, the patient had a diffuse and marked tenderness and rigid abdomen with rebound tenderness. There was rebound tenderness with guarding and bowel sounds were not heard throughout the abdomen. Her heart rate was 120 bpm, blood pressure 85/45 mm Hg and temperature was 35.2°C. Bowel sounds were absent with diffuse peritonitis during palpation. Blood test results showed a CRP (C reactive protein) of 267 mg/L and leucocytes of 16.2×10^9/L. The initial impression was a gastrointestinal perforation. But outside CT scan from other regional hospital showed irregular thinning of uterus fundus -- small amount of ascites with pneumoperitoneum in the abdomen and pelvis. Diffuse mild wall thickening and dilatation of small bowel and colon. Nevertheless, bowel perforation could not be excluded, laparoscopic exploration was done. During the following emergency laparotomy, about 1,000 mL of pus was evacuated and 1×1 cm a perforation at the fundus of the uterus was identified. Drainage of the abdominal cavity alone was done. Hysterectomy was planned secondarily. Proteus mirabilis was isolated from the pus. Results: Unfortunately, on the first day after operation (POD #1), a septic shock that does not respond to inotropics had occurred and the patient had expired. Conclusions: A spontaneous perforation of pyometra merely occurs but should be in the list of differential diagnosis. Late diagnosis and treatment can lead to peritonitis and sepsis which is very fatal.

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### PO_SEP_01_07

QSOFA, SIRS and NEWS2 to Predict 60-day Mortality in the Emergency Department - Prospective Study

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Background and Objectives: Sepsis is the primary cause of death from infection worldwide. In 2016, a new clinical concept termed ‘Quick Sepsis-Related Organ Failure Assessment’ (qSOFA) was introduced to identify high risk patients with suspected infection outside of critical care settings. This study aimed to validate qSOFA in the emergency department in Hong Kong. Furthermore, we compared the prognostic value of qSOFA and the previous criteria- Systemic Inflammatory Response Syndrome (SIRS) along the National Early Warning Score 2 (NEWS2). We also studied the additional value of lactate levels in combination with these tools. Methods: This is a single-centre, prospective study was conducted between July 16-Jan17. Patients (with/without suspected infection) triaged as category 2 (Emergency) and 3 (Urgent) were recruited. All variables for calculating qSOFA, SIRS, and NEWS2 were collected. The outcome measure was 60-day mortality. Venous lactate was also measured. Receiver Operating Characteristic analyses were performed to determine the Area Under the Curve (AUC). Sensitivity, specificity, PPV and NPV, positive and negative likelihood ratio were also analyzed for qSOFA ≥ 2, SIRS ≥ 2, and NEWS2 ≥ 5. Results: We recruited 1,253 patients (median age 72 years, IQR: 59-84; 50.9% male). Overall 60-day mortality was 8.5% (107/1,253). The AUCs for prediction of 60-day mortality for qSOFA, SIRS and NEWS2 were 0.53 (95% CI 0.51-0.56), 0.58 (95% CI 0.55-0.61) and 0.58 (95% CI 0.55-0.61) respectively. Using pairwise comparison of ROC curves, NEWS2 was better than qSOFA (p = 0.0406). The AUC of lactate level was 0.59 (95% CI 0.56-0.62). For the combinations of lactate with qSOFA, SIRS, and NEWS2, AUCs were 0.52 (95% CI 0.50-0.55), 0.58 (95% CI 0.55-0.60) and 0.56 (95% CI 0.53-0.59) respectively. The combination of lactate with the individual scores gave no difference in AUC. Conclusions: Among emergency and urgent patients presenting to the ED, the AUC for NEWS2 is greater than that of qSOFA. Combinations of lactate level with qSOFA, SIRS or NEWS2 did not improve the prediction of 60-day mortality in ED patients.

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### PO_SEP_01_04

Fatal Case of Spontaneous Rupture of Pyometra

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Background and Objectives: Pyrometra is a condition of disease that a pus collection occurs in uterine cavity. Spontaneous perforation of pyometra is very rare case. We encountered fatal mortality case of pyometra. Methods: A 80-year-old woman was transferred from other regional hospital with severe abdominal pain. On physical examination, the patient had a diffuse and marked tenderness and rigid abdomen with rebound tenderness. There was rebound tenderness with guarding and bowel sounds were not heard throughout the abdomen. Her heart rate was 120 bpm, blood pressure 85/45 mm Hg and temperature was 35.2°C. Bowel sounds were absent with diffuse peritonitis during palpation. Blood test results showed a CRP (C reactive protein) of 267 mg/L and leucocytes of 16.2×10^9/L. The initial impression was a gastrointestinal perforation. But outside CT scan from other regional hospital showed irregular thinning of uterus fundus -- small amount of ascites with pneumoperitoneum in the abdomen and pelvis. Diffuse mild wall thickening and dilatation of small bowel and colon. Nevertheless, bowel perforation could not be excluded, laparoscopic exploration was done. During the following emergency laparotomy, about 1,000 mL of pus was evacuated and 1×1 cm a perforation at the fundus of the uterus was identified. Drainage of the abdominal cavity alone was done. Hysterectomy was planned secondarily. Proteus mirabilis was isolated from the pus. Results: Unfortunately, on the first day after operation (POD #1), a septic shock that does not respond to inotropics had occurred and the patient had expired. Conclusions: A spontaneous perforation of pyometra merely occurs but should be in the list of differential diagnosis. Late diagnosis and treatment can lead to peritonitis and sepsis which is very fatal.

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Challenges of Regional Medical Response to Express Railway Disaster: Yilan, Taiwan 2018
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Background and Objectives: The aim of this study was to identify critical challenges regarding the regional medical emergency operation system of the 2018 Puyuma express train crash that occurred at Xinma station, outside Su’ao Township, Yilan County, Taiwan. Methods: Hospital records of all the injured who were admitted to the three hospitals in the region were reviewed and compiled by descriptive statistics. The instant fatalities (n = 18) were collected on site. Analysis of the patient distribution of 157 casualties of the crash by collecting data on medical treatment capacity, number of patients received per hospital, triage classification, secondary transfers, distance from the crash site, and the critical mortality rate. Results: There were three receiving hospitals (distance from crash: 3.5–10.4 km) within 15 km of the crash and received 157 casualties (including secondary transfer). 9.6 percent (n = 20) suffered fatal injuries, of which 90% (n = 18) died at the crash site and 10% (n = 2) at the hospital. Thirty-one percent (n = 47) of those admitted to hospital suffered multi-trauma (i.e., extensive, severe, and/or critical injuries). The head, neck and spine sustained 42.5% (n = 20) of the injuries followed by the trunk (chest, abdomen, and pelvis; n = 16; 34%). For all casualties with “Resuscitation” or “Emergency”, the level I trauma center received 55.8%, the level II trauma center received 28.6%, and the level III trauma center received 26.6%. Only 10 casualties were secondarily transferred, and no casualties died in, or on the way to hospital (critical mortality rate = 0%). Conclusions: A mass-casualty incident with an extensive amount of fatal, severe, and critical injuries is most probable with railway transportation. Efficient triage and patient diversion, even in areas with relatively insufficient medical resources, can significantly improve the ability to deal with mass casualty incidents and the survival rate of patients.

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Triage under Threat in Multiple Casualty Situations: A Case Report of Miss-triage in Indonesian Soccer Championship Football Riot
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Background and Objectives: Triage is the medical screening of patients according to their need for treatment and the resources available. It applies to mass-casualty situations, when conventional standards of medical care cannot be delivered to all victims. This case showed how miss-triage was carried out by emergency department staff due to triage under threat in mass casualty situations. Methods: A riot was broken during a football match between local team vs. Indonesian national team. 46 victims were brought to our emergency department and got treated immediately. Problems occurred when some of the victim’s friends came inside the emergency department and threaten emergency department staff to handle their relatives especially one who came with head injury. Results: 82.61% victims came with head injury, followed by 4.35% victims with upper extremity injury, 4.35% victims with lower extremity injury and 8.70% victims came with multiple injuries. When threats occurred, these threats brought chaos in triage bay and causing 91.30% patients categorized as level P2 and 8.70% patients categorized as level P3. After securities (police forces in conjunction with hospital security officers) came and helped to make the situation safe, we are able to triage the patient properly. Conclusions: In extreme triage situation, triage process has been affected significantly and may causing miss-triage in the emergency department. Many patients will possibly be classified in higher triage as they should be. And as a result, in the re-triage process, down-triage or even up-triage will possibly occur. Police forces and other security officers play vital roles to make the work situation safe for emergency department staff.

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Background and Objectives: Under the Korean National Disaster Response Frame, Public Health Disaster Response Team (PDHRT), separately Disaster Medial Assistant Team, have been organized by every Community Health Center since 2016. PDHRT members primarily work for community health in the ordinary, and they are mobilized when a Mass-Casualty-Incident is expected to occur. This study sheds light on the operational status of the PDHRT and their awareness on Public Health Disaster Response System. Methods: A preliminary study was accompanied by a literature review on Public Health Disaster Response System and the questionnaire was distributed by National Emergency Medical Center Regional Offices. The data was obtained after inspecting the survey questionnaire being which was filled out by PDHRT members. There were a total of 254 samples. Data was managed and analyzed by IBM SPSS Statistics 22, using descriptive statistics. Results: PDHRT members’ average total work period in Community Health Centers was 121.5 months (max 460, min 1), and 20 months as members of the PDHRT. Disaster-related tasks account for 29.6% of the routine, while very few stated 100%. Of the total respondent, 69.7% had experience with disaster operation in the past year, and 18.1% had been dispatched to the disaster site. Research has proven that the average awareness mean score (rating 1 to 5 scale) for organizational management including budget and personnel was below the midpoint (2.73 ± 0.83), capacity of Community Health Centers received the highest agreement score (3.54 ± 0.84). The mean for Legal and regulatory measures, Cooperation system and Personal competency were 3.32 ± 0.84, 3.52 ± 0.83, and 3.35 ± 0.80 respectively. Significant positive correlations were found between system components, especially capacity of Community Health Centers and Cooperation system (r=0.71, p<0.01). Conclusions: This study primarily presents the Korean PDHRT and its operational status. Findings from awareness analysis suggest that national and systemic efforts are necessary to strengthen the Public Health Disaster Response Capacity and Competency.

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Table-top Simulation Exercise of Critically Ill Patient Evacuation From a Hospital Fire
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Background and Objectives: Recent hospital fire incidents in South Korea has heightened the importance of patient evacuation. Moving patients from intensive care unit (ICU) or emergency department (ED) setting is a challenge, due to the complexity patients reliant on invasive monitoring and organ support. Despite the importance of patient evacuation, the readiness of ICU and ED for urgent evacuation has not been assessed. The objective of this study was to enhance the readiness and competencies of workers from ICU and ED in evacuation of patients during a simulated table-top fire exercise. Methods: Table-top simulation exercise was developed by the Center for Disaster Relief, Training, and Research referencing the fire evacuation manual developed by the hospital’s ICU and ED. The scenario consisted of evacuating patients horizontally and vertically from each department. The participants’ actions were assessed using checklist developed by the research group. Debriefing was done after the exercise to discuss the gaps observed. Post-survey questionnaire was used to evaluate the exercise and assess the perception changes of the participants. All pre-to-post differences within subjects were analyzed with paired t tests. Results: Total of 22 and 29 people participated in the exercise from ICU and ED, respectively. Knowledge and confidence improved post-exercise for both ICU and ED scenarios (p<0.05). Overall course satisfaction was 7.9 and 8.7, respectively for ICU and ED exercise. Overall correct performance rates for ICU and ED were 59% and 58%, respectively. Common gaps noted for both ICU and ED were wearing protective masks, patient hand-over communication, and preparation for resources. Conclusions: There needs to be exercises to recognize gaps of systems in place for hospital fire evacuation preparedness. Table-top simulation exercises is an ideal tool for this purpose. Although this was a short 90-minute exercise, this increased familiarity with evacuation plan, tested the plan, and allowed the identification of gaps.

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Multidisciplinary Hearing and Analysis of Hospital Evacuation After the 2016 Kumamoto Earthquake

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Background and Objectives: At March 2018, Kyoto IMED, informatics-Medicine-Engineering research against Disaster, designed the BCP of Kyoto University Hospital (KUHP) because it is required that disaster medical hospitals in Japan should create a Business Continuity Plan (BCP) against natural disaster (e.g. strong earthquakes) by March 2019 in order to manage this sharp increase in medical demands in case of disaster. This requirement is partly because of the April 2016 Kumamoto earthquake that 10 hospitals were forced to evacuate for various reasons. Methods: In order to investigate and verify the reasons for hospital evacuation, Kyoto IMED formed a multidisciplinary team and conducted hearing surveys at ten hospitals A to E in October 2016. The survey items were disaster responses, hospital resources such as structural and non-structural components of buildings, and the others (e.g. resource supply, medical equipment, and electronic medical record system). Results: The first reason was concerns on seismic resistance of buildings. The buildings of hospitals A to C were very old. Hospitals A to E did not undergo seismic performance diagnose or the buildings were evaluated as seismically-deficient. The second reason was the water shortage due to building infrastructure damage and regional infrastructure damage. Hospitals F to I decided to take hospital evacuation because of water shortage. Furthermore, the nine out of ten facilities decided to evacuate within 24 hours. Conclusions: This result shows that very quick decision was required to hospital owners or managers who do not have enough knowledge of buildings and there was no time to wait for the rapid building inspection by registered structural engineers. Some hospital evacuations are inevitable, therefore the BCP of regional medical system is also indispensable in order to maintain essential medical services of hospitals such as emergency care, urgent operations, maternal and child care and recover as soon as possible in case of natural disaster.

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Organizing the Emergency Department in Mass Casualty Incident

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Background and Objectives: In a multi-casualty incident when the emergency department receives the main burden of the injured. Organizing the Emergency department in a short time have a great impact on the treatment of the injured. Methods: At Rambam Hospital, a protocol has been prepared, which is copied by other hospitals in order to organize the emergency department, defining the role of the physicians and nurses. Results: After a number of simulation testing the protocol, the final procedure examined revealed that it works efficiently in a number of real events. Conclusions: The simulation case is prepared in advance, with options of treatment arms and the results of such. Many research studies of the learning processes in medicine have proved simulation to be the most useful of teaching tools.

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Trauma Simulation

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Background and Objectives: Mastering treatment of the trauma patient requires intensive training. We can reach these levels of expertise via simulation of the trauma team. The simulation requires minimal equipment, a mannequin a simple aim or computerized one, a video camera for filming the simulation and debriefing rooms with ability to view the filming. Methods: Simulations are performed with the entire trauma team physicians, nurses, radiology technicians, blood bank, and respiratory specialists. A scenario is planned ahead of time with the goal of checking the fitness of the trauma team. In the simulation setting the team uncovers mistakes and learns from them without causing harm to the patient. Results: The simulation case is prepared in advance, with options of treatment arms and the results...
Social Media Platform Equalized Educational Resources Discrepancy Between Small-scale Emergency Medicine Residents Training Programs

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Background and Objectives: Shift work and rotation training hinder peer learning and resources sharing between emergency medicine (EM) residents. In Taiwan, 42 training programs enrolled 108 first year EM residents and most programs enrolled less than 3. Small scale training programs lead to unnecessary repeat resources input. We started a Facebook group Emergency Medicine Resident Network (EMRN) in 2015 to make resources sharing more efficiently. “First year EM residents’ co-orientation” project was raised in late 2018 by EMRN on YouTube for resources sharing between junior residents. Methods: The topics of the online project were proposed and chosen by EMRN members via online voting. The speakers were invited from the committees of Taiwan Society of Emergency Medicine or senior emergency physicians of different training programs. The content was in audio-visual format and released every week on YouTube channel. Quantitative response of viewed times were collected from the YouTube channel data analysis. Qualitative response of satisfaction score was collected by questionnaire released after the final episode of the project. Results: The EMRN group YouTube channel was established for this project. Fourteen videos and 2 text documents were released. There were 155 followers at the end of 2018. All the videos were viewed more than 4,000 times. The leading topic was viewed more than 400 times and the top 5 topics were viewed more than 1,800 times. “Introduction of EM subspecialty” and “protocol of chief complaint-based evaluation” series were the most viewed episodes. The satisfaction score in the questionnaire was highly correlated with viewed times. Conclusions: Educational contents on social media were viewed more frequently than limited into single training programs. Resources can be utilized more efficiently, and impact be magnified through the help of social media.

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FIT-CPR vs. Conventional Classroom Method: Challenging the Convention

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Background and Objectives: Heart disease is the leading cause of death in Malaysia and worldwide with 20.1% of all death in the country. The most effective methods to improve the survivability of out-of-hospital cardiac arrest (OHCA) is early CPR. In Malaysia, only 8.7% of OHCA received bystander CPR, unfortunately, none of them archived return-of spontaneous-circulation (ROSC). Thus, to improved public awareness and performance of CPR, a novel and simple yet exciting approach was proposed which is Fit-CPR Program. In this study, we want to evaluate the effectiveness of Fit-CPR program compared to conventional-classroom-method (CCM) among public. Methods: Participants were randomized into Fit-CPR or CCM groups. Each group was assigned to learn either through Fit-CPR or CCM protocol. Fit-CPR protocol includes 10 minutes of mass CPR teaching, 5-km running, then CPR test. The CCM protocol was: 30 minutes of didactic lecture, 15 minutes group teaching and practices (instructor: students: 1:6), then CPR test. 10 facilitators were utilized to teach Fit-CPR while 12 facilitators for CCM. Knowledge input for Fit-CPR group was done during the 10-minutes mass-CPR teaching period. Each of the participants was put through a pre-test and post-test. Each test comprised of 15 item questionnaire to assess the knowledge, willingness to perform CPR and confidence level; and CPR performance on manikin which was assessed using the validated checklist by the calibrated assessors. Results: 70 participants able to complete the Fit-CPR program, meanwhile 71 participants completed the CCM. There was no significant difference between the Fit-CPR and CCM on CPR performance with the mean score were 9.05 ± 0.94 vs. 9.14 ± 1.18 (p= 0.6175). However, for the assessment of the knowledge between Fit-CPR and CCM, the mean score was 7.69 ± 1.30 vs. 8.50 ± 1.01 (p<0.05). Conclusions: Fit-CPR program is as good as CCM in improving CPR performance on a manikin with less number of facilitators and less utilization of time.

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A Prospective Randomized Controlled Trial to Explore the Effectiveness of 2 Community Programmes to Teach CPR +AED: “Dispatcher Assisted First Responder” and “Restart a Heart”

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Background and Objectives: Bystander response to out-of-hospital cardiac arrest (OHCA) is essential to improving OHCA survival rate. Two short (1 hour) community programmes, Dispatcher Assisted First Responder (DARE) and Restart a Heart (RAH), were developed to train laypersons in CPR and AED. This study compared participants’ between training programmes in terms of perceptions of the training programme and attitudes toward performing CPR. Methods: We recruited 220 community members to participate, and randomly assigned them to either DARE or RAH. Pre-/post-training surveys measured knowledge and attitudes towards performing CPR/AED. Results: Pre-/post-training surveys were available for 214 of 220 participants. Overall, both programmes’ participants rated their training experiences similarly. This included ratings regarding the trainer using simple language that was easy to understand (RAH: 93.5% vs. DARE: 87.9%), and ease with which they followed the steps in the programme. There was also significant improvement in knowledge in both groups in terms of what to do when attending to a patient who collapsed, the correct number to call, how to do chest compressions, how to use the AED and minimise interruptions of chest compression after the AED is used. Additionally, participants’ attitudes toward performing resuscitative tasks were explored, yielding similar results in terms of checking for breathing (RAH: 59.4% vs. DARE: 54.2%), likelihood of pumping on the chest (RAH: 50.9% vs. DARE: 45.5%), and likelihood of using the AED (DARE: 54.4% vs. RAH 50.9%). Conclusions: We conclude that both of these short CPR/AED training programmes are easy for trainees to understand and have desirable impacts on their knowledge and intentions to participate in resuscitation events, if needed. Additional work is ongoing to explore CPR/AED performance and skill retention.

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How to Effectively Teach Non-technical Skills in Pre-hospital Care?

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Background and Objectives: Non-technical skills, including cognitive and interpersonal skills, are fundamentals for effective teamwork. Studies show that 70-80% of mistakes made in the medical setting are due to human factor, which can be further subdivided into situational awareness, decision-making process, communication, teamwork, division of work and leadership. The goal of this work is to formulate the principle of teaching of individual non-technical skills using Kolb’s theory of the learning cycle. Methods: The system of teaching soft skills is based on Reflective Observation of past experiences, in which students, individually or in groups, try to see new opportunities, through targeted reflection and validation or even transformation of past experiences, which do not have to appear in normal experiences. This is how newly gained information is tied to students’ personal philosophies with individualized impact on one’s immediate reality. Results: The resulting effect is shown when training is correctly set, particularly with the help of a simulated reality of a pre-hospital care environment in the simulation center, where process demonstrations focusing on decision making and critical thinking can be created, by using techniques such as role playing, video recording and simulation. The result is an elevation of self-awareness in non-technical skills and experiences and it allows students to use it correctly in real life situations. Conclusions: It should be noted, that only a correctly and effectively set teaching of non-technical skills with the assistance of simulators allows individual participants of emergency response teams to be properly prepared for a vast amount of extreme situations, which they could possibly deal with on a day to day basis.

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Diameter of Endotracheal Tube During Chest Compression: a Manikin Study
Jung Wan Kim

Background and Objectives: Adequate airway management plays an important role in high-quality cardiopulmonary resuscitation (CPR). Airway management during in-hospital CPR is usually performed by using an endotracheal tube (ETT). However, there is little research regarding the changes in flow rate and airway pressure depending on the size of ETT used during CPR. Methods: We were divided into two groups depending on whether chest compression was performed. We measured flow rate (FR), peak airway pressure (Ppeak), mean airway pressure (Pmean), and tidal volume (TV) for ETTs of different sizes (diameter 6.0 to 8.0 mm). TV (500 mL) was supplied at a rate of 10 times per minute using a ventilator. Chest compression was maintained at a constant compression depth and speed using an automatic chest compression device. Results: Several respiratory physiological parameters during chest compression were found to be significantly different according to the diameter of each ETT [group B, 6.0 mm vs. 8.0 mm, median (inter-quartile range, IQR)]; FR (L/min) 3.21 (3.05-3.53) vs. 2.89 (2.75-3.08), p < 0.001; Ppeak (cmH2O) 48.84 (27.46-52.11) vs. 27.45 (22.53-52.57), p = 0.007; Pmean (cmH2O) 18.34 (14.61-21.66) vs. 13.66 (8.41-19.24), p < 0.001; TV (mL) 502 (487-507) vs. 504 (464-512), p = 1.0. Conclusions: Significant differences were observed in FR, Ppeak, and Pmean according to ETT size. As the ETT size increased, FR, Ppeak, and Pmean decreased and showed a larger change during chest compression.

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Non-rheumatic Giant Left Atrium Causing Central Airway Obstruction: a Case Report
Christopher Guanzon Manalo, Faith Joan Mesa-Gaerlan

Background and Objectives: A giant left atrium is a rare condition. While it predominantly develops from a rheumatic mitral heart disease, a non-rheumatic valvular involvement is exceptionally uncommon. Airway and pulmonary effects are infrequently described in literature unlike the typically reported cardiac complications such as worsening heart failure and persistent atrial fibrillation. This paper aims to present a rare case of a non-rheumatic giant left atrium causing central airway obstruction in a 71-year-old Filipino woman. Methods: The case was documented in the University of the Philippines-Philippine General Hospital Medical Intensive Care Unit. Relevant clinical information were retrieved during the patient’s hospitalisation with informed consent. Results: Transthoracic two-dimen-
sional echocardiogram and contrast-enhanced chest computed tomography revealed a giant left atrium measuring 102 mm × 99 mm in maximum axial dimensions compressing the left main stem bronchus. Spectral color flow Doppler findings showed severe aortic stenosis with severe secondary mitral regurgitation. Conclusions: Thus, a case of a degenerative non-rheumatic giant left atrium causing central airway obstruction in an elderly Filipino woman was presented in this case report.

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A Case Series on Smoke Inhalation Injury
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Background and Objectives: Smoke inhalation injury (SII) is a deadly condition associated with fire injuries. Increasing mortality by 24-fold, SII is the most common cause of death at the scene of a fire. SII is present in 2 to 30% of all burn patients, and the incidence is higher if facial burns are present. Defined as damage done due to inhalation of harmful gases, vapour, and toxic particulate in the smoke, SII may manifest as a thermal injury, chemical injury, systemic toxicity, or any combination of these. Methods: We describe a family of seven that was rescued from a burning house. The father noticed smoke in the hall and rushed everyone out of the house. He was the last person to get out of the building. All seven of them were brought to the Emergency Department (ED). The father was intubated soon after arrival to the ED as there was evidence of an impending airway

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obstruction. The mother was managed conservatively for mild smoke inhalation injury with minimal facial burns. She subsequently required a short duration of BiPAP support due to partial atelectasis of the right lung. The eldest daughter, who was initially managed conservatively, required tracheal intubation 13 hours later as mild laryngeoaema was evident on video laryngoscopy. The second daughter had an acute exacerbation of bronchial asthma due to the smoke irritant, and was managed accordingly. The other 4 children were monitored closely in the ED and subsequently discharged well. **Results:** Threshold for intubation should be low for SII patients. SII patients should be closely monitored with periodic reassessment. **Conclusions:** SII is a potential life-threatening condition. Early recognition and prompt management is critical to reduce morbidity and mortality. Corresponding Author: Jia Huang Lau (lauijahuang@gmail.com)

**PO_AIR_01_05**

**Comparative Study of Kingvision Videolaryngoscope and Macintosh Laryngoscope in the Emergency Department of a Tertiary Care Centre in India**

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**Background and Objectives:** Endotracheal intubation is a life-saving procedure for critically ill patients in whom there is failure of ventilation, oxygenation or there is serious deterioration in condition of patient. Intubations in Emergency Department (ED) are usually performed by using conventional Macintosh laryngoscope or lately with Video laryngoscopes. Which device is better recommended for a busy ED setting was the key question of the study. Most of the previous studies were done in operation theatres on manikins and simulated airways using CMAC or Glidescopes. Studies related to Kingvision Video laryngoscopes in ED are few and used Manikins or were done on trauma patients. The objective of our study was to find out which laryngoscope leads to faster intubations in humans in a busy ED. **Methods:** The study was done in the ED of Max Super Specialty Hospital in New Delhi. This was a prospective randomized study. Patients aged above 18 years coming to our ED requiring intubation were included in the study and randomized 1:1 alternatively into two groups (Kingvision video laryngoscope and conventional Macintosh group). An observer was kept to check on time taken (noted with a stopwatch) for intubation (defined as the time from inserting the laryngoscope to tube passing the cords). Other parameters like number of attempts, espagale or failed intubations, complications, crossover done among each group, were also noted. **Results:** Overall Mean time for Macintosh intubations was 14.85 seconds [CI 13.15-16.54] and Kingvision video laryngoscope was 13.10 seconds [CI 11.38-14.81]. Mean time (seconds) for Consultants using Macintosh and Video was 13.84 [CI 11.29-16.38] and 11.6 [CI 8.66-14.53] respectively. Mean time (seconds) for residents using Macintosh and Video was 15.84 [CI 13.39-18.28] and 11.6 [CI 8.66-14.53] respectively. **Conclusions:** Our study showed Kingvision video laryngoscope to be a faster means to intubate when used by specialists or residents.

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**PO_AIR_01_06**

**A Case of Angioedema Requiring Emergency Tracheal Intubation**

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**Background and Objectives:** Angioedema without urticaria, which is also referred to as Quincke’s edema, is sudden-onset localized edematous swelling of the subcutaneous or submucosal tissues. Typical forms of this disease include hereditary and drug-induced angioedema. Although edema can develop in any part of the body, the onset of laryngeal edema has the potential for a fatal outcome. We here report our experience with a patient who presented to our hospital with symptoms of upper airway stenosis due to angioedema and required emergency tracheal intubation. **Methods:** A 51-year-old woman, with a history of atopic dermatitis and childhood asthma, was brought in by ambulance with a chief complaint of upper airway stenosis symptoms. Subsequently, allodynia was determined to be responsible for the upper airway stenosis. **Results:** Tracheal intubation was performed. Neck computed tomography also revealed marked swelling in the epiglottic and laryngeal arytenoid regions. On hospital day 2, examination of the larynx with a fiberscope revealed resolution of the swelling. She was extubated. On hospital day 4, oral administration of trimexamic acid was started to prevent further attacks. On hospital day 13, she was discharged without relapse of symptoms and in good general condition. **Conclusions:** When angioedema not associated with common allergic reactions is detected in the larynx, prompt airway management before an airway emergency develops is important because upper airway obstruction carries a high risk of a fatal outcome.

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**PO_AIR_01_07**

**Observational Study of Intubation Practice in the Emergency Department of a Tertiary Teaching Hospital in Jakarta, Indonesia**

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**Background and Objectives:** Endotracheal intubation is considered a gold standard in airway management. This is a mandatory skill for every doctor in the field of emergency. As far as we know, there are no data regarding airway management, especially emergency intubation in Indonesia. Whereas this data is important to describe the quality of airway management and to describe the quality of emergency department services. To describe the characteristics, indication, success rate, complication and outcome of intubation practice in the emergency department (ED) of a Jakarta tertiary teaching hospital. **Methods:** This is a prospective observational study. Data was collected from the airway registry of ED Cipto Mangunkusumo Hospital from August 2017 to March 2018. It completed by the intubating team. **Results:** During the 8 months study period, there were 115 patients intubated were recorded. There were 98/115 (85.22%) patients with medical condition and 17/115 (14.78%) patients with trauma condition were intubated. Respiratory failure occurred in 36 patients with medical condition. From 115 patients, there were 127 intubation attempts which majority done by anesthesia residents (99.8%) with first attempt success were in 106 (92.2%) patients. Hypoventilation occurred in 6 (5.2%) patients but most of the intubation were without complication (102/88.7% patients). There were 21 (18.3%) intubated patients death in ED. **Conclusions:** Intubation in ED mostly done by anesthesia resident with first attempt success rate and complication are preferable compared to other data published.

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**PO_INJ_01_01**

**Risk Factors of Severe Head Injury in Occupants on Motor Vehicle Crashes Based on Korean In-Depth Accidents Study**

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**Background and Objectives:** The aim of this study was to find out the risk factors affecting the severe head injury in occupants on motor vehicle crashes. **Methods:** This retrospective study was based on Korean In-Depth Accident Study (KIDAS) database from January in 2011 to June in 2018. Of all, 1,276 head injured occupants were selected. It was analyzed by two groups, severe and non-severe head injury group. Also several indicators were chosen, those were the general characteristics (sex, age, height, weight, and body mass index), the vehicle factors (seat belt use, speed at impact), the crash characteristics (e.g. crash speed and direction) and the severity of injury group. Also several indicators were chosen, those were the general characteristics (sex, age, height, weight, and body mass index), the vehicle factors (seat belt use, speed at impact), the crash characteristics (e.g. crash speed and direction) and the severity of injury group.

**Results:** For further study, it would be neces-
sary more factors about the vehicle damage, the environment, and the human injury.

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**PO_INJ_01_02**

Comparison of Work-related Motorcycle Accidents and Non-occupational Accidents Visiting Emergency Department

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**Background and Objectives:** Motorcycles are widely used in various workplaces and services. Increasing demand for deliveries led to widespread use of motorcycles for occupational purposes. We aimed to emphasize on work-related motorcycle accidents among motor vehicle accident cases by analyzing its characteristics and outcomes.

**Methods:** A retrospective analysis was made with data from Emergency Department-based Injury In-depth Surveillance from 2012 to 2016. During that period, motor vehicle accidents regarding motorcycle drivers, 16 years or older, were included. Cases were divided into two groups as work-related and non-occupational accidents. General characteristics, injury details, and clinical outcomes including severity, emergency department mortality were analyzed.

**Results:** Total of 25,695 cases were included in the study period and 13.3% (3,430) were work-related. For both groups, age group of 20-29 were the most injured group (22.0%, 23.4%). Autumn was the most frequent season of work-related injury (28.2%). Collision to the flank was the most frequent pattern (34.0%) and small 4 wheel vehicles were the most common counterpart (67.6%). In work-related group, alcohol intake was significantly lower (0.7% vs. 8.2%, p<0.001) while helmets were more equipped (72.7% vs. 60.0%, p<0.001). Work-related accidents presented lower severity by EMS-ISS score of 25 or higher (18.6% vs. 25.5%). Also ED mortality and admission rate was lower in work-related victims (0.8% vs. 1.5%, 30.3% vs. 31.8%). Logistic regression analysis on severe work-related accidents revealed higher odd ratio by age (1.02, 95% CI 1.01-1.03), alcohol intake (2.55, 1.06-6.18), and victims not wearing helmet (2.08, 1.67-2.58). Lower odd ratio was shown in injuries with collision pattern of direct impact (0.67, 0.46-0.98) and capsizing (0.43, 0.25-0.76).

**Conclusions:** Work-related motorcycle accidents showed higher helmet usage, lower severity, lower ED mortality, and lower admission rate compared to non-work related accidents. Various factors including age, alcohol consumption, equipping helmet, injury counterpart and collision pattern were related to severe cases.

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**PO_INJ_01_03**

Characteristics of the Accident and Factors Affecting the Death According to Age Groups in Elderly Motorcycle Driver Accident

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**Background and Objectives:** The number of motorcycle deaths per 100,000 people aged 65 and over was the highest among the OECD countries with 5.2 Koreans in 2015. The purpose of this study is to determine the characteristics of the accident and factors affecting the death according to age groups in elderly motorcycle driver accident.

**Methods:** This study is a retrospective study using Emergency Department based on Injury In-depth Surveillance (EDISS) data. EDISS is a prospective injury registry and total 23 EDs in tertiary hospital participate in it. A total of 17,752 motorcycle driver accident were extracted from 2011 to 2016. We classified the participants into three groups with age as follows: 55-64 old is “Young old”, 65-74 old is “Middle old”, 75 old or older is “Old old.”

**Results:** As the age groups changes from “Young old” to “Old old”, the number of accident increased at 12-18 (35.6%, 44.6%, 48.9%), the incidence of single accidents increased (32.3%, 35.1%, 39.9%), and the rate of the accident in farm road increased (1.5%, 3.2%, 3.6%). However, the rate of the wearing the helmet decreased (68.4%, 57.7%, 48.6%). As a result from multivariable logistic regression for death, when “Young old” is as a reference, the odds ratio of “Old old” is 2.302 (95% CI:1.184-3.489) and when “Single accident” is as a reference, the odds ratio of “Wearing the helmet” is 0.545 (0.352-0.842). 

**Conclusions:** The characteristics of the accident according age groups in elderly motorcycle accident were increasing rate of accident in daytime (12-18), increasing the single accident, increasing the farm road accident, and decreasing the rate of wearing the helmet. Factors affecting the death according age groups in elderly motorcycle accident were aged 75 years or older, accident object, and not wearing the helmet.

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**PO_INJ_01_04**

Injury Analysis According to Gender, Age, and BMI Differences on Motor Vehicle Accidents

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**Background and Objectives:** To investigate the major differences of injury severity by gender, age, BMI in motor vehicle accident caused in Korean road traffic.

**Methods:** This is a retrospective study based on Korean In-Depth Accident Study (KIDAS) Database from January 2011 to December 2017. The study population was selected by who visited in the 3 regional trauma centers. In order to investigate the characteristics of injury according to the patient's body mass range, we classified it into 5 mass types (Underweight, Normal range, obese level 1-4) considering Body Mass Index (BMI) dimension.

**Results:** Of the 1,809 passengers, male (n=1,017, 60.2%) highly engaged MV As than the female (n=702, 38.8%). Severely injured patients according to gender differences, the male (n=344, 31.1%) also showed higher rate than the female (n=173, 24.6%). The frontal collision showed the most significance among all directions of collision based severe injuries in both male (n=242, 72.5%) and female (n=118, 68.2%). The incidence of accidents by gender was highest at 50-64 years (n=571, 31.6%), then in order of 35-49 years old (n=517, 28.6%), 20-34 years old (n=514, 28.4%), 65-79 years old (n=185, 10.2%), More than 80 years old (n=22, 1.2%) respectively. On the other hand, the severity of serious injury by gender was highest in patients over 80 years old (n=9, 41.0%). The frequency of accidents according to the gender-specific BMI level was found to be in normal (BMI) score: 18.5-22.9) in both male (n=370, 33.4%) and female (n=357, 50.9%). While the incidence of severe injury was highest in male (n=7, 35.0%) and female in obesity level 2 (n=9, 45%).

**Conclusions:** In conclusion, this can lead an attributed to the aggressive behavior such as speeding or signal violation of young males, and the declining spatial cognitive abilities of elderly females.

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**PO_INJ_01_05**

Five-Year Review of Patients Presenting with Non-Accidental Injury to a Children’s Emergency Unit in Singapore

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**Background and Objectives:** There is an increasing trend of physical child abuse reported in Singapore. Children presenting to the Emergency Department with injuries require a high index of suspicion for clinicians to distinguish those that are abusive in nature.

**Methods:** A retrospective study of children with diagnosis of NAI presenting to KK Women’s and Children’s Hospital (KKH) from June 2011 to May 2016 was conducted.

**Results:** 1917 cases were studied, of which 8.8% had repeated visits. 55% were male; mean age was 7.69. There were 46% Chinese, 33% Malays 15% Indians and 6% other races. Most frequently injured areas were head and neck (50.8%), limbs (32.2%), and chest (5.7%). Most frequent injuries sustained are contusions (53%), cane markings (21%), lacerations (16%), burns (4%) and fractures (1%). Males were more likely to be cained (p<0.001); Biological fathers (37%) were the major perpetrator group followed by biological mother (28%), stepfather and relatives (8%) each) then domestic helpers (6%) 31% came from nuclear families and 53% had separated/single parents. Only 37% cases presented in <24 hours, 21% within 72 hours and 19% from 3-30 days. 55% cases were admitted and 38.9% were discharged. Risk factors for admission were: cases that came without a parent (p<0.001), previously known to Child Protective Service (p<0.001), history of parental substance abuse (p=0.038), mental illness in caregiver (p=0.021), domestic violence (p<0.001),
and children with psychological or behavioural issues. The characteristics of patients presenting to the emergency department (ED) of Hôpital de l’Enfant-Jésus, a tertiary care trauma hospital in Québec city, Canada, voluntarily completed a standardised form, or agreed to be subsequently contacted, regarding their injury. The program coordinator reviewed all ED attendances and completed the form based on the medical charts for patients who refused to be contacted. This study included patients presenting to the Hôpital de l’Enfant-Jésus’ ED between November 2016 and October 2017, seeking medical care for a traumatic injury. Results: During the study period, 16,275 patients attended the Hôpital de l’Enfant-Jésus’ ED following a trauma or an isolated poisoning of which 12,857 were included. Intoxicated patients (n = 701, 5.45%) were slightly younger than their counterparts (p = 0.0002) and more likely to be males (p < 0.0001). Substance use was rarely involved in work- or sport-related injuries. Comparison of different natures of injuries suggested that the proportions of burns, wounds, head injuries and polytrauma were associated with the substance use. Within subgroups of intents of injury, substance use contributed to 3.6% of accidental injuries but was involved in a quarter of injuries inflicted by a third party and almost 40% of self-inflicted injuries. The risk of non-accidental injuries in patients who had used a substance was 7.54% (95% CI: 6.71–8.47) that in non-intoxicated patients. Conclusions: This study outlines the significant contribution of substance use in non-accidental injuries, which should be borne in mind to improve ED-based prevention programs.

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Characteristics of Bicycle-related Trauma Presenting to a National Referral Hospital in Rwanda

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Background and Objectives: Road traffic accidents (RTAs) account for 25% of all cases in the Emergency Department (ED) at University Teaching Hospital-Kigali (UTH-K), a national referral hospital in Rwanda. Bicycle-related trauma represents a subset of RTA-associated injury. However, there is little information about the characteristics of this population. These characteristics can be used to develop public health interventions and improve patient care. This study aimed to identify the characteristics of patients presenting with bicycle-related trauma to the ED at UTH-K in Rwanda. Methods: This was a retrospective study with data extracted from a randomized sample of patient charts at UTH-K from August 2015 through July 2016. A total of 1,639 patient charts were included. Data analysis was conducted on cases of bicycle-related trauma with a focus on demographic characteristics, injury pattern, severity of injury, length of stay (LOS), disposition, and disability at discharge. Results: Bicycle-related trauma represented 16% of RTA-associated injury and 7.5% of overall trauma at UTH-K. The median age was 29 with a predominance of males (81%). The most common injury was head trauma (56%) followed by fracture (42%). Polytrauma was present in 73% of cases. Amongst patients with head trauma, 30% had a Glasgow Coma Score with moderate-to-severe Traumatic Brain Injury. Overall, 63% of patients were admitted to the hospital with a median total LOS of 10 days. Mortality for bicycle-related trauma was 4%. However, 35% of patients required outpatient follow-up (i.e., physiotherapy or wound care) at discharge. Conclusions: Bicycle-related trauma represents a substantial proportion of RTA-associated injury in Rwanda with high burdens of polytrauma and head injury. Although the observed mortality was low in bicycle-related trauma, the morbidity in relation to disability and need for post-injury outpatient care was high and demonstrates the need for further research on prevention and treatment in this population.

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was discharged with eventual complete return to baseline function. Results: Although Walkerley et al noted that neurophysiological findings in PCB are axonal rather than demyelinating, our case clearly showed demyelinating features based on Hadden et al’s criteria and modified set of electrodiagnostic criteria for Guilain–Barré syndrome. Conclusions: This case clearly demonstrates that symptoms resembling conventional GBS can evolve and morph in to its rare form of PCB. This progression should be actively sought out by clinicians.

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**PO_NEU_01_03**

**NIHSS Score Is a Predictor For Stroke-associated Infection**

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**Background and Objectives:** The aim of the study was to analyse whether the baseline National Institute of Health Stroke Scale (NIHSS) scores could be used for predicting Stroke-associated Infection (SAI). Methods: A total of 45 consecutive patients with ischemic stroke who were admitted to our hospital were enrolled. A prospective study was carried out to observe the occurrence of SAI during the first 7 days after stroke. Accordingly, the patients were divided into SAI and non-NAI groups. The relationship between NIHSS scores and SAI was analyzed. Results: The baseline NIHSS scores were high in the SAI group than in the non-NAI group (8.17± 4.5, p=0.019). NIHSS score is an independent predictor of SAI in patients with acute ischemic stroke (hazard ratio= 1.069; 95% CI, 1.021-1.119; p=0.005). Conclusions: NIHSS score could be a predictor of SAI.

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**PO_NEU_01_04**

**An Incipient Belly Dancer’s Syndrome: What Did We Miss?**

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**Background and Objectives:** Belly Dancer’s syndrome which is also known as Belly Dancer’s Dyskinesia is a subtype of dyskinesia attributed to peripheral nervous system disorder. It is a rare movement disorder characterized by abnormal movements in the abdominal wall due to involuntary contractions of the diaphragm. In fact, this repetitive rhythmic movements of the abdominal wall cannot be voluntarily suppressed but may be influenced by respiratory maneuvers. In other words, it could also be known as an ‘abdominal flutter’. Moreover, such dyskinesia is sometimes painful, rhythmic and ordinarily presents as bilaterally slow writhing. Methods: We report a case of a 21 year old male, diagnosed with Belly Dancer’s Syndrome in the year of 2014 complicated with painful abdominal spasm. The clinical presentation was inaugurated by sensory loss below right knee in which ensued to ‘fitting episodes’ requiring mechanical ventilation. Following after, MRI spine was unremarkable and CTPTA evinced pulmonary embolism. Thereafter, the patient was actuated with a series of medications: oxycodone, lamotrigine, sodium valproate, carbamazepine, phenytoin sodium, gabapentin and alprazolam. He has history of multiple hospital admissions for recurrent seizures and abdominal flutter, medicated with intravenous diazepam and pethidine. Also, the serial medications acceded no improvement and subsequently, a right thoracic video-assisted thoracoscopic surgery (VATS) and right phrenic nerve neuroectomy was done in the year of 2017 for intractable right diaphragmatic seizure. Results: Nevertheless, despite surgery the syndrome persevered and he presented to the ED in October 2018 with status epilepticus. The precise cause of the incipient Belly Dancer’s Syndrome in this patient is inerty undetermined. Conclusions: A detailed history and careful examination are mandatory to obtain a correct diagnosis of Belly Dancer’s Syndrome to halt a late diagnosis and treatment. In the circumstances whereby variegated treatment options yield no positive denouement, it is indeed indispensable to set aback and re-gauge the underlying etiology.

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**PO_NEU_01_05**

**Development and External Validation of New Nomograms by Adding Electrocardiogram Changes (ST Depression or Tall T Wave) and Age to Conventional Scoring Systems to Improve the Predictive Capacity in Pa**

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**Background and Objectives:** To develop new nomograms by adding electrocardiogram changes (ST depression or tall T wave) and age to three conventional scoring systems, namely, World Federation of Neurosurgical Societies (WFNS) scale, Hunt and Hess (HH) system, and Fisher scale, that can predict prognosis in patients with subarachnoid haemorrhage (SAH) using our preliminary research results and to perform external validation of the three new nomograms. Methods: This study is Retrospective, observational study. Adult patients with SAH who visit emergency departments (ED) of two universities affiliated tertiary hospital between January 2009 and March 2015 were enrolled. Exclusion criteria were age <19 years; no baseline electrocardiogram; cardiac arrest on arrival; traumatic SAH; referral from other hospital and referral to other hospitals from the ED. The 6-month prognosis was assessed using the Glasgow Outcome Scale (GOS). We defined a poor outcome as a GOS score of 1, 2, or 3. Results: A total of 202 patients were included for analysis. From the preliminary study, age, electrocardiogram changes (ST depression or tall T wave), and three conventional scoring systems were selected to predict prognosis in patients with SAH using multivariable logistic regression. We developed simplified nomograms using these variables. Discrimination of the developed nomograms including WFNS scale, HH system, and Fisher scale was superior to those of WFNS scale, HH system, and Fisher scale (0.912 vs. 0.813; p<0.001, 0.913 vs. 0.826; p<0.001, and 0.885 vs. 0.746; p<0.001, respectively). The calibration plots showed excellent agreement. In the external validation, the discrimination of the newly developed nomograms incorporating the three scoring systems was also good, with an AUC value of 0.809, 0.812, and 0.772, respectively. Conclusions: We developed and externally validated new nomograms using only three independent variables. Our new nomograms were superior to the WFNS scale, HH systems, and Fisher scale in predicting prognosis and are readily available.

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**PO_NEU_01_06**

**The Sinister behind a Sleeping Beauty**

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**Background and Objectives:** Intracranial haemorrhage (ICH) in pregnancy is rare but it constitutes a significant cause of maternal mortality. Despite aneurysmal subarachnoid haemorrhage (SAH) and rupture of arteriovenous malformation (AVM) are the commonest causes of ICH in general, post-partum cerebral angiopathy has been reported quite recently as another contributory factor for of ICH in post-partum mother. Methods: A 35 years old, Para 5, Post 6 days of delivery lady was brought in unconscious by the husband. He claimed that had severe headache before she became consciousness. Upon arrival she was in comat state with spontaneous breathing. Her vitals were unremarkable except for her BP 153/101. Neurological examination revealed unequal pupils, absent gag reflex with hyperreflexia and positive Babinski. Plain CT brain reveal right fronto-temporal intraparenchymal bleed and SAH with midline shift. Patient was admitted to ICU for cerebral protection but died on that same day of admission due to massive ICH. Results: Postpartum cerebral angiopathy is believed to be caused by an inflammatory process, such as vasculitis or transient vasospasm. Hormonal changes that occur during pregnancy and the postpartum period may result in changes to the intima of the blood vessels, and when combined with acute hypertension, contribute to vasospasm. Its clinical presentation is indistinguishable with other causes of ICH. Treatment suggested includes corticosteroids, such as intravenous methylprednisolone, and calcium channel blockers, such as nimodipine, although the current data regarding the successful treatment is limited. Conclusions: Post-partum cerebral angiopathy should be a differential diagnosis in any postpartum patient with neurological deficit or reduce of consciousness. How ever the lack of MRI facilities in East Malaysia pose a challenge for the clinician to confirm their diagnosis. Thus, clinician should be judicious in weighing the risk and benefit of initiating steroid or vasodilator treatment for the treatment of ICH in post partum lady.

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**PO_NEU_01_07**

**Fibrin-Specific Thrombolytic Therapy For Acute CVA Within 6 Hours of**
Onset, Systematic Review

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Background and Objectives: Cerebrovascular accidents (CVA) remains a major cause of disability and death and fibrinolytic agents might reduce long-term disability. We sought to determine whether patients receiving fibrin-specific thrombolytic agent acutely (within 6 hours) following CVA had a better functional outcome (modified Rankin Scale), mortality or intracerebral bleeding at 6-months than patients receiving placebo. Methods: We conducted a systematic review of randomized controlled clinical trials that assessed 6-months functional outcome, mortality and intracranial hemorrhage and compared thrombolytic therapy with placebo in patients randomized within the first 6 hours following CVA. We searched these databases: MEDLINE (1990–2018), Cochrane Central Register of Controlled Trials, and Cochrane Database for Systematic Reviews. Two blinded reviewers reviewed the eligible articles and rated study quality using the Jadad score. We calculated pooled odds ratios (ORs) using a random effect model. Results: We included 9 studies with 6,523 enrolled participants and had 673 deaths. Compared with placebo, thrombolytic therapy within 6 hours after CVA did not result in a statistically significant reduction in 6-month mortality (OR 1.21, 95% confidence interval [CI] 0.94–1.55). More patients in the thrombolytic therapy group had favorable functional outcome (OR 1.20 [CI] 1.07–1.35). Thrombolytic therapy caused more fatal intracerebral bleeding than placebo (OR 5.61 [CI] 3.40–9.24). Conclusions: Fibrin-Specific thrombolytic within 6 hours of CVA improves functional outcome at the expense of increasing symptomatic and fatal intracerebral bleeding.

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Comparison of Video Laryngoscope and Macintosh Laryngoscope For Face-to-face Intubation in Sitting Manikin Model with Limitation of Neck Motion

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Background and Objectives: Airway and cervical spine protection is the first priority for pre-hospital management in traumatic injury patients. In case of limited patient positioning such as motor vehicle entrainment, face-to-face intubation is considered to be an alternative method for securing airway with protection the cervical spine. Nowadays, video laryngoscope has been developed and widely use in instead of Macintosh laryngoscope to assist intubation in this situation. This study aims to compare the effectiveness of video laryngoscope and Macintosh laryngoscope for face-to-face intubation in sitting manikin model with limitation of neck motion. Methods: This was an experimental study, randomization design. Paramedic and medical students were included to intubate the sitting manikin model which applied a cervical hard collar. Participants were allocated by SNOSE to perform intubation by video or Macintosh laryngoscope. Study outcomes include number of success intubation, time to perform successful intubation and classification of laryngeal view. Results: There were 41 participants in this study, 21 were assigned to perform intubation by video laryngoscope and 20 were assigned to use Macintosh laryngoscope. There were no statistically significant in baseline characteristics of all participants. The result showed that face-to-face intubation by Macintosh laryngoscope was more successful and time to perform success intubation was faster than video laryngoscope (20; 100% vs. 5; 23.8%, p-value < 0.001 and 27 ± 24.7 vs. 75 ± 66.3, p-value < 0.001). However, there was no statistically significant in classification of laryngeal view (p-value=0.081). Conclusion: In case of motor vehicle entrainment, face-to-face intubation by Macintosh laryngoscope was more successful and faster than video laryngoscope. It should be considered to perform success intubation.

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PO_RCH_04_02

Comparison of Using Digoxin and Amiodarone For Rate Control Atrial Fibrillation Patients in Emergency Department

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Background and Objectives: Atrial fibrillation (AF) is the most common cardiac arrhythmia characterized by fibrillatory P wave, narrow QRS complex and irregularly tachycardia. It associated to increasing risk of thromboembolism - leading cause of morbidity and mortality. A sustained rapid ventricular response in AF may induce a left ventricular dysfunction therefor the ventricular rate control is therapeutic objective in emergency department. Patients who present with AF and rapid ventricular rate (RVR) can be treated by pharmacotherapy, Digoxin and Amiodarone are commonly used. This study aims to compare the effectiveness of intravenous digoxin vs. amiodarone for achieving rate control in patients with AF and RVR in Ramathibodi’s emergency department. Methods: This was a retrospective cohort study. The information of AF and RVR patients (HR ≥ 120 bpm) who presented at Ramathibodi ED since January to December 2016 were collected from Ramathibodi’s electronic medical record programme. The outcome parameters are difference heart rate at the time before and after drug administration (ΔHR), duration time for treatment in ED and percentage of successful treatment (means no more therapy strategies i.e. electrotherapy) compared between digoxin vs. amiodarone. Results: There were 147 AF and RVR patients, 62 (42.2%) were digoxin group and 85 (57.8%) were amiodarone group. There are no statistically significant in baseline characteristics. ΔHR in digoxin group was 40.2 ± 27.6 and 48.0 ± 25.9 in amiodarone group (p-value 0.137). Duration time for treatment was shorter in digoxin group (136.2 ± 120.3 vs. 311.2 ± 475.0; p-value 0.082). But, treatment with amiodarone had higher successful percentage (89.4% vs. 62.9%; Risk ratio 1.495[CI 1.2-1.7 and p-value <0.001]). Conclusions: There are no statistically significant in effectiveness of digoxin and amiodarone administration to reduce heart rate and duration time of treatment in AF and RVR patients but, heart rate can reduce greater when using amiodarone (clinically significant), had higher percentage of successful and risk ratio for achieving rate control significantly.

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PO_RCH_04_03

Risk Factors of Patients’ Safety Events in the Emergency Department

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Background and Objectives: Understanding factors associated with PSIs (error, AE, near miss) in the ED remains unclear till present, and requires further clarification. The objective was to systematically describe and analyze risk factors involved in the occurrence of PSIs Methods: Setting and participants: data were collected on all patients presenting to a tertiary-care academic medical center ED with an annual census of 57,000 patients between January 2010 and December 2016. Cases of patients meeting predetermined criteria were systematically identified by an electronic medical record system. Criteria for review included patients who (1) presented to the ED within 2 hours and were admitted on their second visit, (2) were admitted from the ED to the floor and then transferred to the intensive care unit (ICU) within 24 hours, (3) expired within 24 hours of ED arrival, (4) procedural sedation or (5) were referred to the QA committee as the result of complaints. Results: Of the 383,586 ED visits during the study period 6,519 cases (1.7%) were considered as quality assurance (QA) flagged cases. The incidence of PSIs in these cases was 6.1% representing an overall incidence of 0.10% among all ED patients. Overall, the rate of adverse events (AEs) over the period 2010–2016 was decreased the year 2011 witnessed the highest rate of AEs, 3.1% and the year 2016 year had the lowest 0.8%. Conclusions: Our electronic a patient safety tracking system (PSTS) identified several patient and event factors associated of being at risk of PSIs. Both patient and physician complaints may be more useful in identifying patient who has PSIs when compared to more standard metrics such as floor to ICU transfer or 72 hours returns, and death within 24 hours. Key words: Patient Safety, Adverse events, Preventable adverse events, Near miss events, Risk factors, Emergency department.

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Prevalence and Associated Factors of Stress, Anxiety and Depression among Emergency Medical Offi Cers in Malaysian Hospitals

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Background and Objectives: Demanding profession has been associated with poor
Psychological Pressure and Endocrine Response in Ultramarathon Athletes
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Background and Objectives: To evaluate the effects of a 12-hour and 24-hour ultramarathon race on self-reported psychological stress and changes in the levels of selected physiological and hormonal markers known to be associated with physical and psychological well-being, both immediately after the exhaustive exercise and over a 7-day period of recovery. Methods: We conducted a prospective observational study of 37 experienced ultramarathon runners, 23 of whom completed a 12-hour marathon and 14 a 24-hour marathon. All runners were permitted to rest and to ingest water and food freely during the race. A psychological stress assessment was completed the day before the race and immediately after the race. The following physiological measurements were obtained one hour before the race, immediately after the race and at post-race days 1 and 7: body weight and serum levels of selected physiological and hormonal markers. Within-subject changes in measured variables were evaluated using paired t-test analysis and between-group differences using independent t-test analysis. Results: Levels of aldosterone, renin, antidiuretic hormone, adrenocorticotropic hormone, cortisol, and triiodothyronine, thyroxine and free thyroxine increased immediately after the race (p < 0.05), combined with a decrease in insulin and testosterone levels (p < 0.05). Feelings of fatigue and distress were significantly increased immediately following the race, and were associated with increase in plasma levels of lactate in the blood and decrease in amylase. Overall, runners reported a feeling of relief after the race. All physiological and hormonal markers returned to baseline values within 7 days after the race. There were no between-group differences overall. Conclusions: Ultramarathon running produced significant immediate effects in levels of physiological and hormonal markers and psychological status. However, no specific effect of a longer duration of race was identified, and all levels returned to baseline levels within 1 to 7 days.

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Kidney Size to Detect Contrast-induced Nephropathy in the Emergency Department
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Background and Objectives: Contrast-induced nephropathy (CIN) are widely recognized as common adverse effects of contrast media. Serum creatinine (sCr) concentration and eGFR do not accurately reflect renal function because creatinine-based GFR estimation is greatly influenced by physiological and clinical conditions that affect body muscle mass. Additionally, in severe life-threatening conditions, we often need to perform contrast-enhanced computed tomography (CT) without laboratory findings. According to the literature, kidney size is related to renal function. This would provide a simple and easy method of CIN risk assessment. We aimed to examine the relationship between kidney size and CIN in patients who underwent contrast-enhanced CT in the emergency department. Methods: This single-center retrospective observational study was performed to evaluate risk factors for CIN at Okayama Saiseikai General Hospital (Okayama, Japan) from January 2014 through December 2016. CIN was defined as an absolute increase in serum creatinine level of ≥0.5 mg/dL or ≥25% over the baseline value within 72 hours after contrast-enhanced CT. Independent risk factors for CIN were determined by multiple logistic regression analysis. The thickness of the kidney was evaluated as a predictor of CIN using the area under the receiver operating characteristic curve. We also analyzed CIN as an outcome using the Kaplan-Meier method. Results: The incidence of CIN was 26/262 (9.9%). In the multivariate analysis, CIN was associated with renal thickness (odds ratio = 0.65, 95% confidence interval: 0.53–0.81). No patient underwent renal replacement therapy. Conclusions: Renal thickness could be used as a reliable, simple, and easily obtainable marker for identifying CIN in patients undergoing contrast-enhanced CT in the ED.

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BLAWMOx95 Score to Guide the Community-acquired Pneumonia Diagnosis in Patients Admitted For Acute Cough at the Emergency Department
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Background and Objectives: The diagnostic approach of patients with acute cough is still a challenge in emergency departments (ED). The goal is to correctly diagnose community-acquired pneumonia (CAP) with rational use of resources, but there is no standard recommendation based on clinical features and the current approach is very heterogeneous. The present study aimed to evaluate clinical features related to the CAP diagnosis in patients with acute cough in ED. Methods: Complete data from 2,392 patients who were sequentially admitted to emergency department for acute cough were retrospectively analyzed from Jan 2015 to Dec 2016. Seventeen clinical characteristics were evaluated at admission: gender, age, systolic and diastolic blood pressure, heart rate, temperature, respiratory frequency, oximetry, cough type, coughing time, dyspnea, chest pain, wheezing, body symptoms, level of consciousness, auscultation and upper respiratory tract infection. Results: 88 (3.67%) patients had CAP diagnosis according to current guidelines. After multiple logistic regression, 7 clinical features were independently related to CAP diagnosis: body symptoms (OR 2.19, IC [95%] 1.36–3.54, p < 0.001); level of consciousness (OR 26.94, IC [95%] 4.47–162.47, p < 0.004); male (OR 1.90, IC [95%] 1.18–3.08, p < 0.004); altered auscultation (OR 19.30, IC [95%] 8.56–43.53, p < 0.001); wheezing (OR 2.75, IC [95%] 1.38–5.48, p = 0.004); male (OR 1.90, IC [95%] 1.18–3.08, p = 0.009) and oximetry under 95% (OR 3.20, IC [95%] 1.54–6.65, p = 0.002). BLAWMOx95 is an acronym of these characteristics. Upper respiratory infection was related with absence of CAP (OR 5.19, IC [95%] 3.24–8.31, p < 0.001). Conclusions: Score on BLAWMOx95 in patients with acute cough without upper respiratory tract infection association implies further investigation with chest x-ray seeking CAP diagnosis. This strategy may homogenize evaluation with rational use of resources, since most diagnoses of acute cough are benign and self-limited without specific treatment.

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In the emergency department (ED) are not disclosed, this is important for risk
management in hospitals and regions. Some institutions have their own manuals
while others do not. Therefore, this study aimed to determine whether Japanese
Association for Acute Medicine (JAAM)-certified hospitals have IC manuals for
the ED, and investigate the contents of manuals, consulting systems, and isolation
facilities for ED. The results can contribute to establishing essential lists for pre-
paring IC manuals for ED. Methods: A total of 517 hospitals certified as educa-
tional institutions for board-certified acute care physicians in Japan were request-
between March and May 2015 to provide a written evaluation of IC in ED. Re-
results: A total of 51 of 301 (16.9%) hospitals that responded regarding manual
availability had no manuals regarding IC in ED. Among 250 hospitals having ED
manuals, 115 did not have contents about disinfection and sterilization for imag-
ing examination rooms, while only 44 (17.6%) had criteria for contacting the
emergency medical service (EMS) when patients are suspected of or diagnosed
with communicable diseases. Of the 298 hospitals that responded regarding Influen-
za manuals, 227 (93.0%) prepared specific manuals for the 2009 pandemic in-
fluenza. Of the 301 hospitals that responded regarding Ebola manuals, 80 (26.6%)
did not prepare manuals for the Ebola virus disease outbreak in West Africa in
2014. Furthermore, 92 of 257 (30.4%) did not have any negative-pressure isol-
ation rooms. Conclusions: The practices and guidelines for IC in ED were not suffi-
ciently covered in the hospitals studied. Such elements are required to prevent
secondary infection among health-care providers and staff, EMS personnel, and
other patients. Therefore, education, information sharing, and a checklist for pre-
paring manuals are needed to establish better IC systems in ED.

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PO_OTH_03_07
Epidemiology and Clinical Outcomes of Emergency Medical Events
Who Visit International Airport
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Background and Objectives: The use of airplane is becoming more and more fre-
quent worldwide. Even though increasing number of flight passengers, there is no
comprehensive database that accurately reflects the frequency of emergency med-
cial event at the airport. We evaluated the characteristics and treatment outcomes
of patient with emergency medical event at the airport. Methods: We retrospec-
tively reviewed cases of patient with emergency medical event at the Incheon in-
ternational airport between May 2013 and April 2018. Analysis of sex, age distri-
bution, medical disease or other-disease (trauma, delivery, intoxication etc…), dispo-
sition and mean staying time was proceeded comparatively with the general
population group who visited our center Results: Among 284,840 patients that
visited our center during this period, 26,027 missing age, sex or disposition were
excluded and 258,813 patients were eligible for our study. 1,076 patients (0.4%) were transferred from the Incheon international airport and the ratio of men was 61.3% compared to 53.6% to the general population group; patient group from the airport had a mean age of 42.4 years-old and the ratio of pediatric patient of 8.5% compared to a mean age of 33.2 years-old and 33.7% of pediatric patient ratio compared to the general group. The disposition, inter-ala, between two groups differed: the admission and mortality rate of airport patients were relatively higher with 36.2% and 2.2% than the general group with 22.7% and 0.5%. Patients who visited our center for emergency medical event demonstrated several features compared to the general population group: higher mean age, higher rate of admission and mortality. This study was conducted retrospectively and has certain limitations inherent by its design; a prospective study would be necessary in the future.

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**PO_OTH_07_03**

**Violence Against the Elderly**

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**Background and Objectives:** Older individuals are significant less likely to become victims of violence than younger age. The reasons are that younger people are more likely to be injured by known offenders. As the elderly’s social participation increased, the risk of exposure to violence in the community increased. The purpose of this study was to investigate the general characteristics of violence against the elderly.

**Methods:** We selected data of patients who were injured by violence over 65 years of age from the National Emergency Department Information System (NEDIS) of 5 university hospitals in 2017. Through the medical record, we investigated the age, sex and medical history of patients, injury mechanism, place of injury, activity during injury, relation with perpetrator, and outcome. Results: A total of 251,713 cases were registered in the NEDIS dataset during the study period. Of these, 111 elderly patients visited by violence. Except cases who visit twice due to the same event or without intentionality, 103 cases were chosen for further analysis. The median age was 70 (Interquartile range, 66-75) years and, 59 (57.3%) subjects were male. The patient with previous medical disease account for 54.4%, 14.3% of those have mental illness. As for injury mechanism, contusions were most common. 36.9% of perpetrators are acquaintances, violence by family members account for 20.4%. 84 patients who were discharged following successful treatment in the emergency room while 8 (7.7%) patients were admitted or transfer for further management.

**Conclusions:** As the violence of the elderly is frequent not only within the family but also within the community, a social preventive approach to the vulnerable class is needed.

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**PO_OTH_07_04**

**The Effects of Case Management Program Completion on Suicide Risk among Suicide Attempters: a 5-year Observational Study**

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**Background and Objectives:** A prior suicide attempt is known to be the most important risk factor for suicide. Case management programs provide psychosocial support and rehabilitation for suicide attempters. This study aimed to determine whether case management completion is associated with good clinical outcomes for suicide attempters visiting the emergency department (ED).

**Methods:** A cross-sectional observational study was conducted using risk assessment records for suicide attempters visiting the ED from October 2013 to December 2017. We created two groups according to completion of the case management program. The primary outcome was a decrease in suicide risk. The secondary and tertiary outcomes were untreated stressors and lack of a support system. We calculated the adjusted odds ratio (AOR) of the case management completion for study outcomes adjusting for potential confounders.

**Results:** Among 439 eligible suicide attempters, only 277 (63.1%) participants completed the case management program. Participants who completed the case management program were more likely to have decreased suicide risk (65.3% vs. 46.9%, AOR: 2.13 [1.42-3.20]) and less unresolved stressful conditions (49.8% vs. 61.1%, AOR: 0.64 [0.43-0.96]).

**Conclusions:** Completion of a case management program significantly reduces suicide risk. Multicomponent strategies to increase compliance with a case management program are needed to prevent suicide reattempt and reduce the health burden of suicide.

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**PO_OTH_07_05**

**Impact of Discharged Against Medical Advice on the Revisit to the Emergency Department among Suicide Attempters**

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**Background and Objectives:** This study aimed to evaluate the clinical effect of discharge against medical advice (DAMA) on revisit to the emergency department (ED) after suicide attempt and clarified the risk factors related to DAMA.

**Methods:** A cross-sectional observational study was conducted in the ED of Chungbuk National University Hospital from 2015 to 2017. We reviewed the medical records of suicide attempters from the National Emergency Department Information System (NEDIS). Primary outcome was ED revisit rate. We also examined which characteristics of patients were associated with DAMA.

**Results:** Among 953 eligible suicide attempters, 328 (34.4%) patients were reported to have DAMA at least once during the study period. Patients who discharged against medical advice were more likely to revisit the ED after suicide attempts compared with normal disposition patients (11.0% vs. 3.4%, the adjusted odds ratio [AOR]: 3.50 [1.98-6.19]). Independent risk factors for DAMA were age (30-60) (AOR: 1.56 [1.18-2.08]), female (AOR: 1.34 [1.01-1.78]), ED visit at night time (AOR: 1.39 [1.04-1.87]), and poisoning from suicide attempt methods (AOR: 1.70 [1.03-2.82]).

**Conclusions:** Patient who discharged against medical advice revisited the ED more after suicide attempts. Public efforts are needed for patients who discharged against medical advice considering these risk factors.

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**PO_OTH_07_06**

**The Effect of Emergency Department Expansion and Patient Flow Improvement on Emergency Department Crowding**

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**Background and Objectives:** Emergency department (ED) crowding has been serious problem and there have been many tries to improve it. ED faculty expansion alone was not effective and in some ways it made the crowding worse by increasing the length of stay at ED. We study the impact of ED faculty expansion with combination of introduction of rapid assessment zone on overcrowding.

**Methods:** We performed a before-and-after study of all patients presenting ED of academic medical center. Patients data from pre-expansion period (September, 2015 to June, 2016) and post-expansion period (September, 2017 to June, 2018) are collected from hospital information system. The adult ED beds are increased 44 to 45 beds, the adult chairs are increased 9 to 20 chairs and a new rapid assessment unit for standing patients is established. Short-term ward for ED was newly open. Only patients from ED can be admission to the ward. The number of patients left without being treated (LWBT) is obtained. And time indicators as emergency department length of stay (ED LOS), and the time from decided to admission and to the time that leaving ED to ward (boarding time) are obtained.

**Results:** From pre-expansion to post-expansion, the total visitors in ED is increased 77,078 to 87,027 and daily visit volume 241 to 274. There was significant decrease in the patients LWBT (8,864, 11.5% to 743, 0.9%, <p<0.001). Patients assigned to chair zone increased (18,648, 45.7% to 42,944, 70.7%). ED LOS was increased from 3.21 hours to 3.43 hours (<p<0.0001). Boarding time is decreased from 3.98 hours to 3.18 hours (<p<0.0001).

**Conclusions:** ED faculty expansion and the introduction of rapid assessment zone was not effective on shortening of ED LOS, but it was effective in improvement of LWBT decrease. Short-term ward for ED was effective by shortening the ED boarding time.

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**PO_OTH_07_07**

**Errors on Death Certificate For Trauma Related Death**

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**Background and Objectives:** Error on death certificate has been reported frequently not only in the family but also in the community, a social problem and there have been many tries to improve it. ED faculty expansion alone was not effective and in some ways it made the crowding worse by increasing the length of stay at ED. We study the impact of ED faculty expansion with combination of introduction of rapid assessment zone on overcrowding.

**Methods:** We performed a before-and-after study of all patients presenting ED of academic medical center. Patients data from pre-expansion period (September, 2015 to June, 2016) and post-expansion period (September, 2017 to June, 2018) are collected from hospital information system. The adult ED beds are increased 44 to 45 beds, the adult chairs are increased 9 to 20 chairs and a new rapid assessment unit for standing patients is established. Short-term ward for ED was newly open. Only patients from ED can be admission to the ward. The number of patients left without being treated (LWBT) is obtained. And time indicators as emergency department length of stay (ED LOS), and the time from decided to admission and to the time that leaving ED to ward (boarding time) are obtained.

**Results:** From pre-expansion to post-expansion, the total visitors in ED is increased 77,078 to 87,027 and daily visit volume 241 to 274. There was significant decrease in the patients LWBT (8,864, 11.5% to 743, 0.9%, <p<0.001). Patients assigned to chair zone increased (18,648, 45.7% to 42,944, 70.7%). ED LOS was increased from 3.21 hours to 3.43 hours (<p<0.0001). Boarding time is decreased from 3.98 hours to 3.18 hours (<p<0.0001).

**Conclusions:** ED faculty expansion and the introduction of rapid assessment zone was not effective on shortening of ED LOS, but it was effective in improvement of LWBT decrease. Short-term ward for ED was effective by shortening the ED boarding time.

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Background and Objectives: This study was to investigate errors of death certificate (DC) issued for patients with trauma. Methods: A retrospective review for DC issued after death related to trauma at a training hospital trauma center was conducted. Errors on DC were classified into major and minor errors depending on their influence on the process of selecting the cause of death (COD). All errors were compared depending on the place of issue of DC, medical doctors who wrote the DC, and the number of lines filled up for COD of DC. Results: A total of 140 DCs, average numbers of major and minor errors per DC were 0.8 and 3.7, respectively. There were a total of 2.8 errors for DCs issued at the ED and 5.4 errors for DCs issued beyond ED. The most common major error was more than one COD on a single line for DCs issued at the ED and incompatible causal relation between CODs for DCs issued beyond ED. The number of major errors was 0.5 for emergency physician and 0.8 for trauma surgeon and neurosurgeon. Total errors by the number of lines filled up for COD were the smallest (3.1) for two lines and the largest (6.0) for four lines. Conclusions: Numbers of total errors and major errors in DCs related to trauma only were 4 and 0.8, respectively. As more CODs were written, more errors were found. Education and steady quality control are needed to improve the quality of DC.

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PO Emerson 04.01
Knowledge about Pressure Ulcer Prevention: a Survey of EMS Providers
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Background and Objectives: Pressure ulcers may develop during emergency transport. In particular, patients immobilized for long ambulance transports are exposed to continuous pressure causing skin lesions, associated with morbidity and mortality. In 95% of the cases, pressure ulcers can be prevented. Research of the integration of prevention practices of pressure ulcers in the emergency medical services (EMS) context is scarce. To describe the knowledge and attitudes of prevention of pressure ulcers practices in EMS. To produce information that can be used in the development of prevention practices and early identification of pressure ulcers in the prehospital setting. Methods: A cross sectional study. All EMS personnel in the Helsinki University Hospital area were invited to participate. A validated five-factor scale APuP instrument was used. The material was collected in spring and autumn 2017 through a structured e-questionnaire, which included two scales (34 claims) based on the prevention practices and early detection of pressure injuries to be rated on a three-point rating scale (1 = Right, 2 = Wrong, 3 = I don’t know). The data was analyzed by the SPSS statistical program by descriptive statistics (mean and standard deviation). Results: Of 250 eligible providers, 179 participated (response rate 71.6%). 97.1% (n=172) were emergency medical technicians. The mean years of experience in EMS was 5.6 years. Participants had lack of knowledge in prevention of pressure ulcers (62.7%) and in about risk assessment of pressure ulcers (75.0%). Of the 179, 50.2% (n=90) felt that they need further education in prevention and early identification of pressure ulcers. Conclusions: According to the results, EMS personnel had insufficient knowledge in prevention and risk assessment of pressure ulcers and thus there is a need for further education.

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PO Emerson 04.02
When Triage Is Insufficient—the Benefit of Bedside CRP Within Ambulance Care
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Background and Objectives: Patients with degressed (DCG) forambiguous reasons receive low triage priority. Their death risk is triple. Most of the patients over 18 years who exhibit non-specific symptoms and transported to the emergency room. In patients with unspecified conditions, defined according to the inclusion template, a venous blood sample was taken prehospital at the scene by the EMS. Significance tests and regression analyzes with 95% CI were used. The diagnostic accuracy of Q-CRP, lactate, suPAR and combinations thereof were compared with optimal boundary values. Results: A significant correlation was observed between the Q-CRP, CRP, suPAR and lactate values (p < 0.05). At the multivariate analysis CRP (p=0.000), Q-CRP (p=0.005), lactate (p=0.001) and age (p=0.009) were independent predictors of hospital admission, whereas suPAR and gender were not significant in this material. CRP, Q-CRP and lactate were the most predictive biomarkers in the risk stratification of patients with suspected infection initially admitted to hospital care. Conclusions: Q-CRP and CRP together with lactate can identify potentially critically ill patients from the patients with DGC. The Q-CRP may therefore help in early prehospital detection of the patient's critical condition.

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PO Emerson 04.03
Epidemiology of Infant Out-of-hospital Patients
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Background and Objectives: In our previous work we found that infants form a vulnerable patient group whose needs are not necessarily recognized by emergency medical services (EMS) personnel. In this work we wanted to explore this group in more detail. Methods: We report observations from a dataset covering all (n=1,725) EMS responses for infants (age under 1 year) during five years (2013 to 2017) in Helsinki, Finland. Results: There were total of 1,725 EMS-treated infants during 2013 to 2017, which comprised around 345 missions yearly. The five most frequent dispatch codes were breathing difficulties 471 (27.3%); fall, high energy 322 (18.7%); sudden deterioration of general condition 144 (8.3%); airway obstruction 142 (8.2%). Only 40.2% of infants were transported to the hospital. The majority of non-transported were discharged without further scheduled contact to health services. Only 328 (19%) of non-transported infants sought care from a pediatric hospital. About half of the visits (47.4%) were planned (EMS personnel encouraged to seek for a prompt care). But half of the visits (52.6%) were unplanned (EMS personnel did not think immediate hospital care would be necessary). Most of the patients (93.1%) contacted hospital during first 24 hours following EMS contact and majority (94.8%) condition was good at presentation. Only 72 infants had to be hospitalized. We discuss only preliminary study results in this abstract. More details from this dataset will follow. Conclusions: We describe the epidemiology of a unique five-year cohort of infants. Reasons for infants’ emergency calls differ from those of older children and from adults. Although infants form a small proportion of all EMS calls, this study gives an insight into what are the reasons behind the calls. Also, we investigate what happens to non-transported infants.

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PO Emerson 04.04
Hygiene Perception and Motivational Factors of Influence on Hand Hygiene in the Emergency Medical Services: an International Survey
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Background and Objectives: Hand hygiene (HH), a cornerstone in infection prevention and control, lacks quality and oversight in the emergency medical services (EMS). Improvement is complicated and includes both individual and institutional aspects. However, little is known about EMS HH perception and motivational factors leading to high-quality HH. We aimed to investigate HH perception and motivational factors related to self-reported high-quality HH compliance among EMS providers. Methods: A cross-sectional, self-administered questionnaire consisting of 24 items (developed from World Health Organization’s (WHO) Perception Survey for Health-Care Workers) provided information on demographics, perceived feasibility of practical measures, and various behavioral, normative- and control beliefs among EMS providers from Denmark, Finland,
Compliance with Hand Hygiene in Emergency Medical Services: an International Observational Study

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Background and Objectives: Healthcare-associated infection caused by insufficient hygiene is associated with mortality, economic burden, and suffering for the patient. Emergency medical service (EMS) providers encounter many patients in different surroundings and are thus at risk of posing a source of microbial transmission. Hand hygiene (HH), a proven infection control intervention, has rarely been studied in the EMS. The objectives of this study were to assess HH compliance and adherence to additional hygiene parameters among EMS providers.

Methods: A multi-center observational study conducted comprising ambulances from Finland, Sweden, Australia, and Denmark, December 2016 to May 2017. Two observers registered following parameters: HH compliance according to WHO guidelines (before patient contact; before clean/aseptic procedures 2%; after the risk of body fluids 8%, after patient contact 29% and after contact with patient surroundings). Also, glove use and basic parameters such as nails, hair and use of jewelry were registered.

Results: Sixty hours of observation occurred in each country, for a total of 87 patient encounters. In total, 1,344 indications for HH. Use of hand rub was observed: before patient contact 3%; before clean/aseptic procedures 2%; after the risk of body fluids 8%, after patient contact 29% and after contact with patient-related surroundings 38%. Gloves were worn in 54% of all HH indications. Adherence to short or up done hair, short, clean nails without polish and no jewelry, was 99%, 84%, and 62%, respectively. HH compliance was associated with wearing gloves (OR: 45; 95% CI: 10.8–187.8; p = 0.000) and provider level (OR: 1.7; 95% CI: 1.1–2.4; p = 0.007), but not gender (OR: 1.3; 95% CI: 0.9–1.9; p = 0.107). Conclusions: HH compliance among EMS providers was remarkably low, with higher compliance after patient contacts compared to before patient contacts, and an over-reliance on gloves. We recommend further research on contextual challenges and hygiene perceptions among EMS providers to clarify future improvement strategies.

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Preparation and Pre-Hospital Aspects of Long Distance Marathon. a Private EMS Provider Experience

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Background and Objectives: According to Marvin Adnet, a retired medical director of Boston Marathon, “Marathons are not exercises in sports medicine; they are exercises in disaster planning.” There are deaths as high as 1 every 50,000 marathon runner and 1 in every 300,000 short distance runners. The estimate of medical assistance is approximately 1-3% in a normal condition and 10% during extreme condition. - Understand the logistics that go into planning for and covering long distance and endurance races. - Identify the key components of a medical team. - Discuss medical supplies and equipment needed. - Review medical conditions that may be encountered. - Contingency Planning.

Methods: This is a descriptive study of the preparation and implementation of medical plan of a private EMS provider in the Philippines for a Long Distance Marathon. Data and information are collected from the forms and protocols of the private company. Results: Planning stage is divided into 3 aspects: provision of adequate medical care, provision of medical director and medical coordinator and lastly, appropriate training of medical staff. Collaboration with community agencies and familiarizing with routes of the race are also included in the planning stage. Implementation stage: teams are divided into start, course, finish line, communications, advance medical post and post-finish line teams. Each team has their own roles to play. Special teams like quick response teams such as ambulance and race-ponders for course teams and spotter tower team for finish line teams are also provided. Basing on the expected number of patients on a given time and area of the route, the medical staff are divided accordingly.

Conclusions: Medical preparation is relevant in any sports medicine, but specially in long-distance marathon. We can not compromise the safety and well being of our runners.

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A Race of Time: Against the Angry Sea

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Background and Objectives: Sabah geographical characteristics posts a definite challenge to Prehospital Care (PHC) unit in providing emergency services and transfer care to the public. We present a recent high-risk retrieval case which was done via sea route. Methods: A 35-year-old grand multipara lady with unsure of date pregnancy, was referred to our retrieval team on 24th October 2018 for pre-eclampsia from a very secluded area in Sri Ganda, Kinabatangan in Sabah. Upon assessment by a visiting health team, she was diagnosed with Pre-Eclampsia. However, road access to the village was in bad condition and no suitable vehicle was available from the nearest hospitals. Thus, we need to consider sea retrieval as an alternative to retrieve this patient. Fortunately, with the help from the Fire Brigade team and Malaysia Maritime team, we managed to despatch a trained retrieval team via sea route. It took a total of 8 hours journey throughout the rough sea, bad weather and dark environment. Despite the challenges faced, we manage to transfer the patient to tertiary hospital where she received prompt care for condition. The patient successfully delivered a healthy baby boy the following day via emergency caesarean section. Results: Prehospital care emergency medicine services have been expanding over the years; not just involving the land transfer but also via air and water route. Due to the limitations faced when dealing with rural areas in Sabah especially along the shorelines, designated training for the PHC team should be done with the inter-agencies. Regular training shall facilitate smooth transfer and retrieval effort in future if needed.

Conclusions: Challenges in PHC in Sabah calls for alternative route in patient retrieval. Thus, regular training for challenging retrieval in line with the necessities of the public should be conducted in future.

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Introduction of the Pre-hospital Emergency Triage System Using Mobile Phones in Local City Jurisdictions of Japan

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Background and Objectives: It is important to properly assess the degree of emergency in the pre-hospital setting undertaken by the emergency medical services (EMS) and verify the validity of the triage level. From January to March 2018, we launched a new system of pre-hospital 5-level triage using mobile phones and outcome information (death at ER, admission to intensive care units, admission to the general ward, discharge) entered by tertiary hospitals in the local Japanese city jurisdiction of Kurashiki, with a population of 480,000. We verified the effectiveness of the EMS performing emergency assessment on site and the validity of the results.

Methods: We performed a retrospective observational study using data from the database of the Kurashiki city EMS. Between January and April 2018, a total of 7,223 patients were transported to hospitals directly from the scene. We assessed
the utilization of the tools by EMS, the change of the time on site and the validity of the triage level. Results: The implementation rate was 70.5% in January, which increased to 83.5% in April. The average time on site in January was 15 minutes and 56 seconds, which was delayed for approximately 1 minute compared to the same month in the previous year. However, in April this shortened to 14 minutes and 38 seconds. The degree of the triage level to the outcome information of the tertiary hospital was generally correlated. Conclusions: Our study shows that it is a useful system for assessing the adequacy of emergency level by EMS and allows the informed decision of an appropriate destination hospital. We will continue to confirm the validity of this system and implement it at primary and secondary medical institutions of the entire region in addition to tertiary hospitals.

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PO EMS 06 01

Construction of a New Pre-hospital Emergency Medical Service in Japan's Remote Area

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Background and Objectives: In approximately 98% of areas of Japan, emergency medical service has been established by paramedic of fire stations. However, the remaining 2% are municipalities in remote areas that do not have fire department due to geographical/financial factors, and town officers who do not have medical qualifications operated ambulances. The number of Japanese paramedic license holders is approximately 60,000 people. More than 50% of paramedic qualified people work as a paramedics in a fire station, but remaining all the paramedic license holders are not working as a paramedic. Methods: The remaining 2% is a medical depopulation area, and town officer were carried ambulance services. We introduced a private paramedic to ambulance services. In addition to the town officers, we also made our paramedic ride and made a system to conduct emergency work. Results: As a result, from the system where two town officers transported by emergency request, we set up a system to work with 4 persons, including two paramedics of our company in addition to town officers. On June 1, 2015, Japan Emergency Medical System Co., Ltd. launched emergency medical service which is Japan's first effort at Misato Town, Miyazaki Prefecture. Misato Town is one of the municipalities without a fire department. Furthermore, since April 1, 2017, we are conducting emergency medical service at Katsaura Town, Tokushima Prefecture, which is also municipalities that does not have a fire department. Conclusions: We constructed a new pre-hospital emergency medical service in Japan's remote area. As a result, the work place of the paramedic license holder increased in Japan.

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PO RES 04 01

Comparison of Cerebrospinal Fluid and Serum Neuron Specific Enolase Concentrations in Predicting Neurologic Outcome in Cardiac Arrest Survivors under Target Temperature Management

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Background and Objectives: Serum neuron-specific enolase (NSE) is a widely used biomarker for prognostication of neurological outcome after cardiac arrest survival. We aimed to compare cerebrospinal fluid and serum NSE values for prediction of neurological outcome in cardiac arrest survivors under target temperature management (TTM). Methods: We undertook a single-centre prospective study examining cardiac arrest (CA) patients treated with target temperature management (TTM). NSE levels were assessed in blood and in CSF samples obtained 0, 24, 48, and 72 hours after return of spontaneous circulation (ROSC). The primary outcome was 3-month neurologic outcome. Results: Of 21 patients enrolled, the good outcome group comprised 11 (52.4%) patients. Median NSE values at 0, 24, 48, and 72 hours significantly differed between serum and CSF (p=0.015, p=0.001, p=0.002, and p=0.001). In addition, CSF NSE values were showed significant different among neurological outcome groups at all time intervals, but serum NSE values were not different between neurological outcome groups at 0 hour after ROSC (p=0.075). Serum NSE at 24 hours had a higher area under the receiver operating characteristic curve (AUC) (0.882; 95% confidence interval (CI), 0.667–0.980) than other time points. CSF NSE values at 0, 24, 48, and 72 hours showed higher AUC (0.891, 0.945, 0.945, and 0.955) than serum NSE at 24 hours. Conclusions: CSF NSE was more closely associated with poor outcome than serum NSE. Furthermore, CSF NSE values differed between neurological outcome groups at 0 hours after ROSC.

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PO RES 04 02

Usefulness of a Quantitative Analysis of the Cerebrospinal Fluid Volume Proportion in Brain Computed Tomography For Predicting Neurological Prognosis in Cardiac Arrest Survivors Who Undergo Target Temper

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Background and Objectives: Brain swelling post-cardiac arrest may affect cerebrospinal fluid volume. We aimed to investigate the prognostic performance of the proportion of cerebrospinal fluid volume (pCSFV) using brain computed tomography (CT) in cardiac arrest survivors. Methods: This retrospective multicentre study included adult comatose cardiac arrest survivors who underwent brain CT scan prior to target temperature management (TTM) from 2015 to 2016. Grey-to-white matter ratio (GWR) and pCSFV values were calculated. pCSFV analysis was performed using automated quantitative analysis programming. The primary outcome was a 6-month neurological outcome. Results: Of 251 patients (median age, 57 years), 173 (68.9%) were male, 87 (34.7%) had a shockable rhythm, and 160 (63.7%) had unfavourable neurological outcomes. GWR but not pCSFV was significantly higher in terms of favourable neurological outcomes (p=0.015). pCSFV prognostic performances were similar to GWR, and were poor overall, (0.521; 95% confidence interval [CI], 0.446–0.694 vs. 0.515; 95% CI, 0.441–0.589). After adjusting for covariates, pCSFV but not GWR was independently associated with neurological outcome 6 months following cardiac arrest (p=0.049). Conclusions: pCSFV was independently associated with neurological outcome 6 months following cardiac arrest, however prognostic performance was not good.

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PO RES 04 03

Characteristics of Dead on Arrival in Cameroon

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Background and Objectives: We aimed to describe the characteristics of dead on arrival (DOA) transported to a specialized emergency centre in Cameroon. Methods: We conducted a retrospective study at a 50-bed public emergency centre in Yaounde, Cameroon. We reviewed hospital records of the DOA who visited the centre from January to July 2018. DOA was defined as any patient who arrived in cardiac arrest and who was declared dead upon arrival by the physician after 15-60 minutes of unsuccessful cardiopulmonary resuscitation (CPR) or without any attempt of resuscitation. Results: Of 5,643 patients who visited the centre during the study period, 115 (20 per 1,000 visits) met our definition of DOA. A total of 73 DOA patients with complete records were analyzed. Patients under the age of 60 accounted for 76.7% (n=56), and 42.5% (n=31) were females. A majority of patients were transported by taxi (75.3%, n=55), but only 2 patients (2.7%) were brought in by an ambulance. About one fifth (19.2%, n=14) of the arrest occurred during the transport. Most of the arrests were witnessed (91.8%, n=67), but bystander CPR was performed only on one patient (1.4%), and 4 patients (5.5%) received CPR upon arrival at the hospital. The common presenting complaints were injury (30.1%, n=22), loss of consciousness (21.9%, n=16), and respiratory distress (20.5%, n=15). No factor was significantly associated with receiving CPR upon arrival. Conclusions: Our study suggested the significant burden of DOA in emergency units in Cameroon, the need for raising public awareness of bystander CPR and improving prehospital emergency care system. A demand for multi-center study with in-depth information using standardized criteria of DOA exists.

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Central Venous Oxygen Saturation Is Not an Appropriate Criteria as a Guideline For the Therapeutic Endpoint of Treatment After Out-of-hospital Cardiac Arrest

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Background and Objectives: A critical decrease in systemic oxygen delivery is followed by an increase in systemic oxygen extraction ratio and a decrease in central venous oxygen saturation (ScvO2). Anaerobic metabolism ensues when the limits of this compensatory mechanism cannot maintain systemic oxygen consumption, leading to lactate production. Therefore, current guidelines for post-cardiac arrest care recommend measuring and correcting ScvO2 above 70%. However, many post-cardiac arrest patients show an impairment of systemic oxygen utilization, leading to elevated ScvO2 in spite of hyperlactatemia. The aim of the study is to elucidate whether ScvO2 can be used to guide treatment of out-of-hospital cardiac arrest (OHCA).

Methods: This is a multi-center retrospective observational study of OHCA patients from June 2016 to November 2018. Adults (>18 years) who had undergone targeted temperature management were included in the study. Patients were divided into two groups; Group 1 (defined as cerebral performance category (CPC) score of 1 or 2 at the time of hospital discharge) and Group 2 (CPC score of 3, 4 or 5 at the time of hospital discharge). ScvO2 and lactate were serially assessed every 6 hours in the first 24 hours after cardiac arrest, and correlations between ScvO2 and lactate were assessed, and were compared between the two groups.

Results: 79 patients were included in the study, of which 17 (21.5%) patients were allocated to Group 1, while others 62 (78.5%) were allocated to Group 2. ScvO2 and lactate were not significantly correlated at every measured time. Lactate was significantly higher in Group 2 at every measured time, while ScvO2 was not significantly different between the two groups at any measured time.

Conclusions: In OHCA patients undergoing targeted temperature management, ScvO2 is not correlated with lactate. Moreover, unlike lactate, ScvO2 does not predict neurological outcome. Utilization of ScvO2 as a therapeutic endpoint is limited in post-cardiac arrest care.

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Dilemma of Applying Broselow Tape to International Pediatric Resuscitations Models

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Background and Objectives: Many countries worldwide are currently developing dedicated emergency and trauma critical care services. As these services continue to develop, we must further concurrently develop the often-forgotten segment of trauma, pediatrics, which often accounts for large fraction of trauma resuscitations.

Methods: We performed a prospective, observational, registry-based study. We divide patient into 4 group based on BT at the ED arrival and registry enrollment; Group 1: at ED arrival ≥ 38.3°C and at enrollment ≥ 38.3°C, Group 2: at ED arrival ≥ 38.3°C and at enrollment < 38.3°C, Group 3: at ED arrival < 38.3°C and at enrollment ≥ 38.3°C, and Group 4: at ED arrival < 38.3°C and at enrollment < 38.3°C.

Primary outcome is 28-day mortality. Results: A total of 993 patients were included. The 28-day mortalities were 8.0%, 9.0%, 9.8% and 20.2% in Group 1, 2, 3, and 4, respectively (p<0.05). Age was different, but the Sequential Organ Failure Assessment score and quality of care were not different among the groups. Group 4 showed higher mortality rate than group 1 in multivariate analysis (odds ratio, 2.8; 95% CI, 1.5–5.1).

Conclusions: Changes in BT between at the ED arrival and at the enrollment can be used to predict 28-day mortality in septic shock patients.

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Association Between Changes in Body Temperature with Prognosis in Septic Shock Patients

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Background and Objectives: Although fever may not be present even in patients with sepsis, clinicians usually monitor temperatures to screen for infection. Prior studies have explored the relationship between initial body temperature (BT) and mortality for patients with sepsis in emergency department (ED). However, there is no study whether changes in BT are associated with prognosis in these patients. We hypothesize that changes in temperature between ED arrival time and septic shock registry enroll time are related to prognosis of septic shock patients.

Methods: We performed a prospective, observational, registry-based study. We divide patient into 4 group based on BT at the ED arrival and registry enrollment; Group 1: at ED arrival ≥ 38.3°C and at enrollment ≥ 38.3°C, Group 2: at ED arrival ≥ 38.3°C and at enrollment < 38.3°C, Group 3: at ED arrival < 38.3°C and at enrollment ≥ 38.3°C, and Group 4: at ED arrival < 38.3°C and at enrollment < 38.3°C.

Primary outcome is 28-day mortality. Results: A total of 993 patients were included. The 28-day mortalities were 8.0%, 9.0%, 9.8% and 20.2% in Group 1, 2, 3, and 4, respectively (p<0.05). Age was different, but the Sequential Organ Failure Assessment score and quality of care were not different among the groups. Group 4 showed higher mortality rate than group 1 in multivariate analysis (odds ratio, 2.8; 95% CI, 1.5–5.1).

Conclusions: Changes in BT between at the ED arrival and at the enrollment can be used to predict 28-day mortality in septic shock patients.

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“1 Was Shocked by Her Heart”: A Case of Hazardous Chest Compression in a Collapsed Patient with Internal Cardioverter Defibrillator

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Background and Objectives: If a patient enters a life-threatening cardiac arrhythmia, advanced life support (ALS) protocols should be initiated immediately. Although an Internal Cardioverter Defibrillator (ICD) will attempt defibrillation, chest compression should be continued. Methods: A 64 year old lady with background history of triple vessel disease, post CABG 2 years prior and post ICD insertion 1 year prior (due to resuscitated ventricular tachycardia), presented to our Emergency Department (ED) with few episodes of brief “blank stares”. After about 10 minutes of admission, patient suddenly became unresponsive, pulseless and cardiac monitor demonstrated ventricular tachycardia. Chest compression was started without delay by a paramedic. Few seconds later, the patient witnessed to jolt during chest compression and shocking the paramedic. The paramedic had to rest for over half an hour before being able to resume work. The patient had jolted about 9 times and remained unresponsive. CPR was continued.

Conclusions: The 28-day mortalities were 8.0%, 9.0%, 9.8% and 20.2% in Group 1, 2, 3, and 4, respectively (p<0.05). Age was different, but the Sequential Organ Failure Assessment score and quality of care were not different among the groups. Group 4 showed higher mortality rate than group 1 in multivariate analysis (odds ratio, 2.8; 95% CI, 1.5–5.1).

Conclusions: Changes in BT between at the ED arrival and at the enrollment can be used to predict 28-day mortality in septic shock patients.

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Organ Donation After Extracorporeal Membrane Oxygenation Cardiopulmonary Oxygenation in Singapore—a Case Series

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Background and Objectives: Organ donation (OD) has known benefits to donors, donees and health systems, but the gap between supply and demand remains a worldwide concern. Internationally, there has been liberalization of indications and increased use of extracorporeal membrane oxygenation (ECMO), particularly in ECMO cardiopulmonary resuscitation (ECPR) which involves generally patients with few co-morbidities. While OD is not a controversial indication to initiate ECPR, ECPR patients who progress to and become certified brain dead are potential donors. International studies have employed this approach and demonstrated equivalent organ quality recovered from ECMO cases, but this has not been described locally. Methods: We here present the first two cases of successful OD after ECPR in Singapore General Hospital and National Heart Centre. Results: The first patient was a previously well man in his forties. He had presented to the Emergency Department (ED) in ventricular fibrillation after cardiac arrest during a marathon. After resuscitation he had return of spontaneous circulation (ROSC) in ED. He was started on targeted temperature management and planned for urgent cardiac catheterization. He remained hypotensive despite vaso pressors and hence ECMO was commenced. ECMO was weaned off after percutaneous coronary intervention and intra-aortic balloon pump insertion. He subsequently had poor neurological recovery, was certified brain dead on day 7 of admission and proceeded to organ donation. The second patient was in his forties. He presented to ED after cardiac arrest during breakfast. Initial rhythm was pulseless electrical activity. There was intermittant ROSC with resuscitation in ED and ECMO was commenced. Coronary angiography showed normal coronaries and CT brain showed extensive subarachnoid hemorrhage with intra-ventricular extension. Brain death was certified on day 3 of admission and he proceeded to organ donation. Conclusions: ECPR patients who progress to brain death are potential donees. The impact of this on indications to commence and continue ECMO needs further research.

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Bystander Interventions among Out-of-Hospital Cardiac Arrests Before and After Implementation of a Public Access Defibrillation Program—a Pilot Evaluation

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Background and Objectives: This study aimed to evaluate the impact of public access defibrillation (PAD) program in six regions in Singapore. This study aimed to compare bystander interventions and survival before and after program implementation. Methods: This was a retrospective cohort study of OHCA cases in the six regions captured in Singapore’s national OHCA registry. Before period was defined as 1 July 2010–30 June 2015; after period was defined as 1 July 2015–31 July 2016. Primary outcomes were bystander cardiopulmonary resuscitation (CPR) and automated external defibrillator (AED) administration. Secondary outcomes were prehospital return of spontaneous circulation (ROSC) and survival to admission. Results: We included 2,246 cases in the analysis with 1720 cases in the before period and 526 in the after period. In the multivariable logistic regression, the program was associated with an increase in bystander CPR only in residential areas [OR2.56 (95% CI 2.06–3.17)] and an increase in prehospital ROSC [OR1.69 (95% CI 1.03–2.78)] only in arrests that were witnessed by bystanders. No significant association was found for survival to admission [OR1.10 (95% CI 0.83–1.46)]. Although odds of bystander AED administration increased [unadjusted OR2.09 (95% CI 1.10–4.33)] following the program, the rate was low at 2.3%. Conclusions: Our finding that bystander CPR increased only in residential areas highlights the important role a targeted residential PAD program plays in increasing bystander interventions among those who are most likely to witness an OHCA. Although the program was associated with an increase in prehospital ROSC, we were unable to show an increase in survival to admission. Expansion of the program may help address the low bystander AED administration rate.

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Correlation and Agreement Between Observed ETCO2 and Predicted ETCO2 Calculated From EEG Signals: a Pilot Trial
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Background and Objectives: Brain cell viability was not measured directly during cardiopulmonary resuscitation (CPR) in out-of-hospital cardiac arrest (OHCA). We developed the EEG-based brain resuscitation index (EBRI) which is an expected value of end-tidal CO2 calculated from single-channel EEG signals measured from forehead during CPR. We compared the observed ETCO2 and EBRI during CPR. Methods: OHCA patients who received CPR at a tertiary emergency department were enrolled for this study. All CPR procedures were provided without any change, but the single channel EEG electrode was attached on the forehead of OHCA patients. We developed the computation formula to calculate the expected ETCO2 using multiple EEG signal values in previous animal study. Data collection was conducted until return of spontaneous circulation or termination of CPR. Each data was continuously collected by 0.5 second intervals and extremely deviated values such as observed ETCO2 level lower than 5 or higher than 60 were excluded. After 1-minute averaging, Pearson correlation analysis and Bland-Altman agreement plot between observed ETCO2 and EBRI were performed. Results: Total 6 patients with EEG signals during CPR of eligible 13 OHCA patients were enrolled and analyzed from November 2017 to April 2018. Total 4,989 observed and EBRI (expected ETCO2) values from five patients were collected. Positive correlation was found with statistical significance (Pearson correlation coefficient 0.53, p-value < 0.01). The agreement by the Bland-Altman plot showed only 4/48 (8.3%) observations were not within agreement range (Figure 1). In repeated measure ANOVA, there was no significant difference in trend according to CPR duration between observed ETCO2 and EBRI (p-value = 0.91) (Figure 2). Conclusions: We found positive correlation and higher agreement between observed ETCO2 and expected ETCO2 from EEG signals during CPR in OHCA patients. Further study on observational and interventional study on the use of non-invasive EEG signal for measuring CPR quality are needed.
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Teaching Cardio-Pulmonary Resuscitation to Public Is Important to Save Life in Nepal
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Background and Objectives: Nepal with 125 ethnicity 80% of literacy of people are now ready to understand meaning of their body and its meaning to make non-medical Nepalese public to understand and apply CPR in their day to day emergency to save the life. Methods: Analysis of ongoing project study from June 2015 to December 2017 after April 2015 Earthquake affected 12 districts of Nepal by training community people with Advanced First Aid Training. Results: There are 77% unintentional and 33% intentional injuries in Nepalese population. There are 95,902 crashes with 100,499 injuries and 14,512 deaths due to road traffic accident during 2001 to 2013. Nepalese people are dying due to injury and accidents 7.9%, non-communicable diseases 42.1% and infectious diseases 49.7%. There are 97 cases of electrocution with 65% mortality every year and 41 drowning death per year. During last 3 years we trained 4,710 selected general public people for Advanced First Aid Training to make them ready for “First Aid & CPR”, among them 3346 community first aiders, 900 special mothers’ group women for adolescent, maternity and child health first aiders and 374 remote districts of Mountain and hilly region’s ambulance drivers. They are providing first aid services for 87.4% minor, 5.4% major, 0.5% gynecological, 1.7% AMCH, 4.5% trauma and 0.5% Pre-Hospital CPR. We have 8.7% Prevalence of Daily Emergency Case in Nepalese Community with 5 per 1,000 emergency cases Incident of Pre-Hospital Cardiac Arrest. With advanced first aid training, we are preventing 70% of deaths in remote parts of those need CPR. Conclusions: It is a great challenge to train public to be Community First Aider who can tackle day to day emergency with knowledge, attitude and practice being “I’m Ready for First Aid & CPR” to prepare and prevent from increasing tendencies of morbidity and mortality in their community.
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The Association Between Obesity and Outcomes in Patients Receiving Post–arrest Coronary Angiography
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Background and Objectives: Obesity has been reported as a risk factor for chronic diseases, especially for cardiovascular diseases which in turn contributes to higher mortality rate. The influence of obesity on outcomes in cardiac arrest survivors receiving emergent coronary angiography (CAG) remains unclear. This object of the study was to investigate the influence of obesity on outcomes in cardiac arrest survivors. Methods: This study retrospectively recruited 273 adult non-traumatic cardiac arrest survivors who received post-arrest CAG in three hospitals from 2011 to 2017. The enrolled patients were divided into four groups based on their BMI (underweight: BMI < 18.5; normal: 18.5-24.9; overweight: 25.0-29.9; obese ≥ 30). The in-hospital mortality and neurological outcome at hospital discharge were compared between different BMI groups. Cox proportional hazard model was used to evaluate the association between BMI and outcomes. Results: There were 13 (4.8%) patients in the under-weight group, 121 (44.3%) patients in the normal-weight group, 100 (36.6%) patients in the overweight group and 39 (14.3%) patients in the obese group. The obese group had significantly higher rates of in-hospital mortality and poor neurological outcome (cerebral performance scale < 3-5) as compared to the other 3 groups (in-hospital mortality: underweight 38.5%, normal: 29.8%, overweight: 39.0%, obese: 64.1%, p = 0.002; poor neurological outcome: underweight 53.9%, normal: 43.8%, overweight: 47.0%, obese: 71.8%, p = 0.02). Conclusions: obese group presented with higher risk for in-hospital mortality and poor neurological outcome (in-hospital mortality: adjusted hazard ratio (HR) = 5.24, 95% CI 2.30-11.92, p < 0.001; poor neurological outcome: adjusted HR = 3.84, 95% CI 1.68-8.78, p = 0.001). Conclusions: In cardiac arrest survivors receiving emergent CAG, obesity was associated with increased risk for in-hospital mortality and poor neurological recovery.
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A Five-year Retrospective Analysis of Organophosphate Poisoning in a Medical Center
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Background and Objectives: Organophosphorus pesticides are widely used in Taiwan. These insecticides include more than one hundred varieties and have large impact on humans and animals. According to the statistical information of World Health Organization, there are about 30 million people with pesticide poisoning every year, in which the majority of these patients have organophosphate poisoning. Regardless of the exposure pathways in organophosphate poisoning, it is likely to cause serious outcomes or irreversible harm, even death. Therefore, the purpose of this study was to identify determinants of prognosis in patients with organophosphate poisoning. Methods: This retrospective study was conducted at a medical center. Consecutive patients having organophosphate poisoning who visited the Emergency Room between January 2008 and December 2012 were retrospectively enrolled. Data which were collected from the medical record of every patient included demographic information, details of medical history, clinical information, the treatment modalities and outcomes. Logistic regression was performed to determine independent correlates of mortality in patients with organophosphate poisoning. Results: Of the 46 patients with organophosphate poisoning recruited, the mean age was 57±18.7 years, in which 80.4% were male and 63.0% were admitted to the intensive care unit (ICU). The most common comorbidities in these patients were psychiatric disorders (32.6%), followed by cardiovascular disorders (19.6%). During the study period, 5 of the 46 patients died, giving an overall case fatality rate of 10.9%. In multivariate analysis, an increased Acute Physiology and Chronic Health Evaluation (APACHE) II score (p=0.031) was associated with ICU mortality. Conclusions: The APACHE II score on ICU admission is a significant prognostic indicator in patients with organophosphate poisoning. A further prospective study to strengthen this point is required.
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Clinical Scoring Systems in Predicting Severity and Outcome of Mixed Drug Poisoning—A 10 Years of Experience

Raghu Kondle

Background and Objectives: Mixed drug poisoning common in India, next to pesticides. Adult mortality rate due to mixed drug poisoning in rural south India is 0.97/1,000 persons/year. 70-80% of patients admitted to hospitals survive. AIM: Correlate clinical parameters with GCS, APACHE II, PSS & MEES scores at presentation and severity of poisoning and scoring systems with Cholinesterase levels, CPK, LDH, in OP poisoning, other parameters in mixed drug poisoning. Toxicology Registry. Methods: A prospective study on 1,497 cases mixed poisoning was done in the ED at Narayana Medical College Hospital, India, for the period of 10 years (January 2009–September 2018). Clinical and laboratory data conforming to the APACHE II, GCS, PSS, MEES were recorded for all patients on admission (time 0) and 24 hours. Statistical analysis was performed by using IBM SPSS version 22.0. P < 0.05 was considered as statistically significant. Results: 58% males and 42% females. Range of age is 18 to 70 years. Mean of APACHE II, GCS, PSS, MEES, scoring system was statistically significant between time 0 and 24 in the survivors, not significant in the non-survivors. All patients required ventilator support with a fasciculation score of more than 4, low GCS, Airway edema as secondary to hair dye. Total of 80% patients improved after treatment while 8% of patients were discharged with morbidity. Mortality rate was 12%. Suicide was 75%, occupational 10%, accidental 8%, homicidal 2% and unknown 5%. Conclusions: Abnormal clinical and biochemical parameters, lower GCS scoring, cholinergic crisis, requiring larger initial dose of atropine were strong predictors for the need for ventilatory support in mixed drug poisoning. Implementation of scoring system at admissions was useful to identify the severity at an early stage, which could help in the management and prevent the prolonged hospitalization and better patient outcome.

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Beautiful and Deadly: A Case Report on Angel’s Trumpet Poisoning in a 91 Year Old Patient

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Background and Objectives: The Angel’s Trumpet plant is widely known for its medicinal as well as its ornamental use. The tropane alkaloid component, which produces its anticholinergic symptoms causes poisoning especially when inhaled or ingested. This paper presents a 91-year-old patient brought to the Emergency Department due to a decrease in sensorium after eating cooked leaves of the Angel’s Trumpet plant. The patient was given prompt supportive and resuscitative management for the acute poisoning attributed to a thorough understanding and information of the toxicologic properties of this particular plant. 1. To present a case of a 91-year-old male who came due to decreased sensorium. 2. To discuss the toxicologic effects of Datura candida. To discuss the management of Datura candida poisoning. Methods: The initial management primarily focused on the ABCs as well as supportive management was done. Toxicology Department was immediately informed while the patient was being treated at the ED. The patient was hooked to oxygen and IV access was established and hydrated with PNSS. Laboratory results revealed slight elevation in serum potassium and calcium, others laboratory work-up were unremarkable. Results: The patient was discharged improved after two days. Conclusions: The toxic and life-threatening effects of Angel’s Trumpet poisoning are reversible and give a good prognosis. Emergency physicians must be adept in providing initial management to poisoned patients to prevent complications to develop. Awareness of both the health care practitioners and community members is important in recognizing this poisonous plant to avoid exposure either by ingestion or inhalation.

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Estimation of Methanol Level in Racing Car Fuel Using Linear Relationship Between Nitromethane Concentration and Serum Creatinine

Adeline Ngo

Background and Objectives: Toy racing car and other nitromethane-containing fuel additives often contain significant concentrations of methanol. Rapid qualitative test for methanol is not readily available. Treatment can be based on the linear relationship based on least-squares linear regression. Methods: A 41-year-old man presented with confusion and unsteady gait. He drank fuel for radio-controlled racing cars. Initial blood urea nitrogen 7.9 mmol/L and creatinine 8,270 μmol/L. The anion gap was 17 mmol/L. Serum samples were sent for toxic alcohol levels. The calculated osmolality was 282 mmol/kg. Serum osmolality was 430 mmol/kg, with an estimated gap of 148 mmol/kg. The linear relationship between the concentration of nitromethane and the rise in serum creatinine concentration measured by the Jaffe method, analysis by least-squares linear regression of ten serum samples containing nitromethane showed the following relationship: Apparent [creatinine; mmol/L] = 0.9[nitromethane, mmol/L] - 0.21. Results: Using this equation in our patient, we estimated a nitromethane level of approximately 8 mmol/L, leaving a residual, unexplained osmol gap of about 140. Assuming the remaining osmol gap is due to methanol alone, the estimated serum methanol level would be around 400 mg/dL, if multiplied by a conversion factor of 3.2. Based on these estimated levels, and without the benefit of a rapid analysis for methanol, it was decided that our patient had ingested a significant amount of methanol and he was treated with fomepizole and hemodialysis. Two days later, the reference laboratory reported the initial serum methanol concentration to be 399 mg/dL. Patient was discharged after 9 days. Conclusions: Nitromethane causes a marked false elevation of the serum creatinine level when measured by the Jaffe method, which can be exploited to estimate the nitromethane level. The nitromethane level can be subtracted from the osmol gap to provide a residual estimate of the methanol level. Based on the extrapolated methanol level, appropriate treatment can be recommended.

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Lets Drink to that (Death)!—Case of an Acute Methanol Intoxication

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Background and Objectives: Methanol intoxication is a global predicament in our current epoch. Pertaining to this, World Health Organization (WHO) has reported approximately 225 million liters of methanol used each day and the outbreaks of its poisoning arise from the consumption of adulterated counterfeit or informally-produced spirit drinks. In fact, there have been numerous outbreaks in recent years worldwide with the ambit of fatality rates over 30 percent and 20 to 800 casualties involving countries for instance Cambodia, Czech Republic, Ecuador, India, Indonesia, Kenya, Libya, Norway, Pakistan, Turkey and Uganda. Moving on locally, there were 98 cases (45 deaths) delineated recently in Malaysia on October 2018 with 64 in the state of Selangor, 18 in Kuala Lumpur, 13 in Perak and 3 in Negeri Sembilan. Methods: Appertaining to this, methanol is a highly toxic substance and intoxication transpire when it is ingested by various methods such as transdermally, orally or by inhalation. The preponderance of methanol intoxication occur as a result of drinking beverages defiled with methanol. Results: Hence, we report a case of a ‘blind inebriate’ exemplar in a 31 years old gentleman who presented with acute methanol intoxication. He was presented with chief complaints of headache, lethargic and fever for a day precedent to ED. He was obtunded on presentation and hemodynamically compromised with severe decompensated metabolic acidosis. Thereupon, alluded to nephrology and anesthesia team for Intensive Care Unit admission, progressively waned and succumbed after 39 hours upon arrival to the hospital. Conclusions: A rapid recognition and fundamental evaluation of the intoxicated patient is foremost as afferent pupillary defect is an ominous sign of advanced methanol poisoning such as in this case. Combination of a comprehensive history taking, brief initial screening examination, intake vital signs, mental status and pupils, ought to be effectuated to discern immediate measures required to stabilize the patient.

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Artificial Neural Network Analysis to Predict Prognosis of Drug Intoxication in Emergency Department

Sungyoup Hong1, Sun Young Park1

Background and Objectives: Mixed drug poisoning is a global predicament in our current epoch. Pertaining to this, World Health Organization (WHO) has reported approximately 225 million liters of methanol used each day and the outbreaks of its poisoning arise from the consumption of adulterated counterfeit or informally-produced spirit drinks. In fact, there have been numerous outbreaks in recent years worldwide with the ambit of fatality rates over 30 percent and 20 to 800 casualties involving countries for instance Cambodia, Czech Republic, Ecuador, India, Indonesia, Kenya, Libya, Norway, Pakistan, Turkey and Uganda. Moving on locally, there were 98 cases (45 deaths) delineated recently in Malaysia on October 2018 with 64 in the state of Selangor, 18 in Kuala Lumpur, 13 in Perak and 3 in Negeri Sembilan. Methods: Appertaining to this, methanol is a highly toxic substance and intoxication transpire when it is ingested by various methods such as transdermally, orally or by inhalation. The preponderance of methanol intoxication occur as a result of drinking beverages defiled with methanol. Results: Hence, we report a case of a ‘blind inebriate’ exemplar in a 31 years old gentleman who presented with acute methanol intoxication. He was presented with chief complaints of headache, lethargic and fever for a day precedent to ED. He was obtunded on presentation and hemodynamically compromised with severe decompensated metabolic acidosis. Thereupon, alluded to nephrology and anesthesia team for Intensive Care Unit admission, progressively waned and succumbed after 39 hours upon arrival to the hospital. Conclusions: A rapid recognition and fundamental evaluation of the intoxicated patient is foremost as afferent pupillary defect is an ominous sign of advanced methanol poisoning such as in this case. Combination of a comprehensive history taking, brief initial screening examination, intake vital signs, mental status and pupils, ought to be effectuated to discern immediate measures required to stabilize the patient.

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Background and Objectives: Acute drug intoxication (DI) is an important issue with significant mortality and morbidity of emergency medicine. The aim of this study is to predict the risk of mortality associated with DI by artificial neural networks (ANNs) model. Methods: The ANNs and logistic regression model were constructed using overall clinical and laboratory data of 4,017 DI patients. The models were first trained on 1,052 randomly chosen patients, validated and tested on the 452 patients and 120 patients respectively. Statistical indices were used to evaluate the value of the forecast in two models. Results: The training set, validation set and test set were not significantly different for any of the 21 variables. The back-propagation network retained excellent pattern recognition ability after the training. When the ANNs model was applied to the test set, it revealed a sensitivity of 82.3%, specificity of 80.1% for mortality. The accuracy was 82.25%. Significant differences could be found between ANNs model and logistic regression model in these parameters. When ANNs model was used to identify ALI, the area under receiver operating characteristic curve was 0.81 ± 0.04, which demonstrated the better overall properties than logistic regression modeling (AUC=0.701 ± 0.04). Age of patients was most significant prognostic factor associated with mortality from the ANNs model. Conclusions: The ANNs model was a valuable tool in dealing with the mortality prediction problem of ALI following to DI. Approach with artificial intelligence can improve risk prediction and need for intensive care.

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PO_TOX_03_07

It's a Syn, Synthetic Cannabinoid Deaths and Emergency Presentations in New Zealand
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Background and Objectives: New Zealand has had approximately 50 confirmed deaths and hundreds of Emergency Department presentations from synthetic cannabinoids from April 2017 to September 2018. This presentation is a comprehensive overview of Synthetic Cannabinoid (SC) toxicity, the cause of death and a discussion of potential preventative measures that can be taken at a governmental, health and individual level to reduce harm. Methods: This has been based upon review of coroners record, laboratory investigations and a national review of Emergency Department presentations. A multidisciplinary approach to this toxicological outbreak has been conducted in New Zealand and information obtained from; Police, Customs, Forensic Laboratories, Pathologists, Toxicologists and Emergency Physicians has been compiled to produce a comprehensive report on the adverse effects of SCs. Results: AMB-FUBINACA and 5F-ADB have been found to cause harm in New Zealand. They are present in very high doses in seized drug material, with doses 10x that detected in the 2016 New York Zombie outbreak. It is evident that there appears to be distinct patient-risk factors for sudden death in SC use. Concomitant use of psychiatric medicine that increases QTc interval has been present in a majority of the fatal cases leading to presumed fatal Torsades de Pointes. High alcohol levels and obesity appear to be key factors in sudden death and near misses with evidence of positional asphyxia from the collapse phase of synthetic cannabinoid use. Use of the SC is associated with the lower socio-economic users with pre-existing mental health and addiction disorders. Conclusions: SC related deaths and ED presentations could be prevented by ECG screening for QTc prolongation and removing at risk prescription medicines in known SC users. This information is critical for ED and Mental Health specialists. Harm reduction public health campaigns focused on rescuing collapsed SC users are also demonstrated.

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PO_TRA_03_01

The Influence of Alcohol on Trauma Cases in Nanyuki, Kenya
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Background and Objectives: Alcohol is responsible for 3.3 million deaths annually. In Kenya, alcohol is one of the leading avoidable risk factors for disability and death, with the prevalence of injuries related to alcohol use rising each year. Although steps have been taken by the Kenyan government to regulate alcohol use, there is much to be researched about the alcohol-trauma relationship, which may lead to policies to reduce trauma morbidity and mortality. Methods: In the Nanyuki Teaching and Referral Hospital, we conducted a cross-sectional study to determine the proportion of injuries related to alcohol use and assess the socioeconomic factors related to alcohol use and trauma among acute injury patients in the emergency department (ED). We surveyed every injury patient for alcohol use history, details of injury, and demographic information. Each patient was administered a breathalyzer test after they had been medically stabilized. Results: Over a period of five weeks, hundreds of patients were screened. 35 presented with injury. The most common injury was due to road traffic accidents (RTAs). 26% of all injury patients tested positive for alcohol. 88.9% of those patients were employed males. 33% of patients with a positive BAC denied alcohol use, indicating that history from patients regarding alcohol consumption is unreliable. All alcohol related injuries were open wounds or bruises. Conclusions: The main cause of all injury cases in Nanyuki, Kenya was RTAs, and alcohol was seen as a notable risk factor for injury. Given that 1/4 of injury patients tested positive for alcohol consumption, longitudinal data collection should be completed to obtain a more comprehensive analysis of risk factors for alcohol and injury as our study was limited by restricted communication between departments and a small sample size. Such information may have implications for future intervention protocols for the hospitals and government in Nanyuki, Kenya, and throughout the country.

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PO_TRA_03_02

Arterial Embolization under Use of Pelvic Binder “Pelvicky”
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Background and Objectives: Treatment strategy for hemodynamically unstable patients due to unstable pelvic fractures is difficult. In recent guidelines, pelvic packing is the first choice, and pelvic exterior fixation, REBOA, arterial embolization is used in combination with this. There are facilities that cannot be implemented quickly with respect to fixation of the pelvis, and until then it is often fixed with pelvic binder. The aim of this study is to examine the effectiveness of the pelvic binder “Pelvicky”. Methods: We examined the effectiveness of the pelvic binder through the first case of Pelvicky. [Case] A man, who was 20 years old, fell down while driving a motorcycle and was transferred to our hospital by ambulance. At the arrival, GCS was 14 (E4V4M6), pulse was 130 beat per minute, blood pressure was 80/50 mmHg. Pan-scan CT showed traumatic subarachnoid hemorrhage, facial trauma, right pneumothorax, and unstable pelvic fractures. Because of hemodynamically instability, REBOA was inserted from the left femoral artery. Then, pelvic packing was performed, and pelvic fixation was performed with a pelvic binder “Pelvicky”, followed by arterial embolization. Results: Circulatory dynamics stabilized with the effect of packing, pelvic binder, and arterial embolization. After then, pelvic exterior fixation was performed. Angiography was easy to perform under the use of this pelvic binder. In addition, due to the effect of it, the extravasation in the pelvis was slight. Conclusions: It is difficult to perform arterial embolization with pelvic binder using commercially available fixtures and sheets. This is because the position of the belt overlaps the site of the femoral artery puncture. Pelvicky is made to solve such problems. There is no belt around the pelvis binder. The aim of this study is to examine the effectiveness of the pelvic binder “Pelvicky”, which is used in combination with this. There are facilities that cannot be implemented quickly with respect to fixation of the pelvis, and until then it is often fixed with pelvic binder. This is easy angiography, has had sufficient effect.

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PO_TRA_03_04

Patterns and Severity of Paediatric Trauma in Suburban Sri Lanka
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Background and Objectives: In Sri Lanka, 25.3% of the population is under 15 years and the leading cause of hospitalization was trauma (19.3%) in 2016. No data exist regarding injury patterns within paediatric trauma in Sri Lanka. Methods: A descriptive study to evaluate patterns and severity in paediatric patients (age <15 years) with significant trauma, presenting to the accident service of the
Colombo South Teaching Hospital of Sri Lanka for 3 months. Inclusion criteria were patients needing at least overnight admission or discharged home with consultant review following morning. **Results:** The total number of paediatric presentations were 861. 260 patients with clinically significant trauma were included in the study. The mean age was 7.5 years with a male: female ratio 2.1:4:1. The common mechanisms of injury were falls (49.0%), sports injuries (11.1%), motor vehicle accidents (MVA) (10.3%), kids bicycle-related injuries (6.5%), falls of heavy objects (6.1%), burns (1.5%) and nonaccidental injuries (0.8%). Out of the falls, 46.1% occurred by falling from a height with a mean height of 1.15 m. Motorbikes and three-wheelers were involved in 60.0% of MVA related injuries. Percentage of fractures among children was 53.8%, the commonest was forearm (39.2%) followed by humerus 20.7% and supracondylar 10.7%. Mean of the Injury Severity Score (ISS) was 2.93 (SD–3.859) and mean Paediatric Trauma Score (PTS) was 10.03 (SD–1.54). Mortality was 0.003% (n=1), a pedestrian knocked down by a car (ISS of 50 and PTS of 0). **Conclusions:** Most injuries were mild in severity. Commonest injured bone/s were radius and ulna. and the commonest mechanism of injury was falling falls. The vehicles commonly involve in MVA in children were motorbikes and three wheelers.

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**Background and Objectives:** Paulina Nkondora Presenting to the Emergency Department in Tanzania Clinical Characteristics and Mortality Outcomes of Burn Patients

**Methods:** This was a IRB-approved observational prospective study. Demographic, clinical and outcomes data for all trauma patients presenting to the ED of Muhimbili National Hospital (MNH) in Dar es Salaam, Tanzania from 1 May 2016 to 30 April 2017. All burn patients were identified by query of the MNH trauma database. **Results:** We enrolled 7,969 injured patients, including 474 (5.95%) who sustained burns. 298 (62.9%) of the burn patients were male with majority (272 patients, 57.4%) aged between 1-4 years of age. 6 patients died at the ED, additional 6 died within 24 hours and 59 patients (12.4%) died within 30 days of hospital admission. Patients that died in the ED were noted to either have TBSA >60%, inhalation injury, circumferential chest wall burns, or significant full-thickness burns. At 24-hours the patients had high TBSA burns (35–85%) but had no inhalational injuries while most deaths at 30 days had burn injuries with 20%-65% TBSA. Almost half 230 patients (48.5%) of patients were burned by hot water. 38 patients (8%) were injured by hot potrige or beans. **Conclusions:** Burns disproportionately affect children presenting to MNH, while these injuries are less common among adult patients. Contrary to what has been reported in other settings, the incidence of burns in our population was lower in females than in males, though the mortality for females was slightly higher than males.

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**The Role of Abdominal Tamponade in Intra-abdominal Hemorrhage Related Hypovolemic Shock**

**Background and Objectives:** This a 65-year-old female with liver cirrhosis and massive asceses involved in an abdominal blunt injury from motor-vehicle accident then presented delayed hypovolemic shock in emergency department hours after the accident. The patient was sent to local hospital initially then referred to trauma center which is 100 kilometers away. **Methods:** She had only femoral intertrochanteric fracture with a previous THR implant at the first scene. She had stable vital signs and well consciousness during the route to trauma center which is 100 kilometers away but deteriorating consciousness with shock status were recorded about 20 minutes before arriving the trauma center. We have interventions in ER as listed: 1. Endotracheal intubation 2. Ascites tapping 3. Blood examination and blood transfusion 4. CT scan with contrast for abdomen 5. Surgical intervention. **Results:** Her ascites was bloody and abdominal CT with contrast showed moderate amount of intraperitoneal extravasation of contrast media and AAST grade IV hepatic laceration around falciform ligament. Emergent laparotomy was performed for life-saving. She was stable after emergent hepatopuncture but mortality happened in the post-operation 15th day due to sepsis with subsequent multiple ple organ failure. **Conclusions:** In this experience, we would like to introduce a concept of abdominal tamponade. Compartment effect or abdominal tamponade due to massive asceses from portohepatic cirrhosis could be a reasonable mechanism of delayed hypovolemic shock in this patient. Elevation of intra-abdominal pressure by massive asceses may delay the presence of intra-abdominal hemorrhage from liver lacerations and subsequent hypovolemic shock. Trauma patients who might have high intra-abdominal pressure from underlying physical conditions may need to have a longer observation period for possible intra-abdominal hemorrhage.

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**The Painful Break Up**

**Background and Objectives:** A 32 yo gentlemen post MVA presented with hypotension and SOB. His Ct thorax done showed traumatic aortic dissection. He was transferred to PPUM for further management. **Methods:** A 32 yo gentlemen, post MVA, presented with hypotension and SOB. FAST scan done repeatedly negative however in view of transient hypotension and persistent SOH he was subjected for CT Thorax and CT abdomen which revealed thoracic aortic injury. He was transferred to PPUM for endovascular stenting. Primary survey was unremarkable except for saturation reading of 92% and slight bruising over the right flank. He was clearly deformed left LL which was splinted for suspected fracture. His vs.
Initially was borderline hypotension (SBP 95-100 mmHg) with tachycardia. FAST scan done twice: negative. CT thorax: Thoracic aortic injury with mediastinal hematoma, hemopericardium, moderate left hemotorax with collapse consolidation and possible left lateral basal segment pulmonary laceration. CT abdomen: No evidence of solid organ injury seen. Patient was transferred to PPUM for endovascular stenting and patient did well postoperatively. Results: Blunt Traumatic Aortic Injury has high mortality in trauma patients. However the mode of diagnosis is still depending on high suspicion based on mechanism of injury and good physical examination. In this patient, even though our USS done bedside didn’t reveal any hemotorax or haemopericardium, there was limited role in detecting it as patient was obese. Conclusions: The diagnosis of blunt traumatic aortic injury remains challenging. Despite lack of clinical signs, high index of suspicion based on high impact mechanism of injury is important. Role of USS is in detecting thoracic injury is still relevant even though its limitation due to several factors such as patient’s anatomical differences need to be considered.

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**PO_TRA_07_02**

**Better Late Than Never**

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Background and Objectives: A 28 yo gentleman post MVA presented with SOB, chest pain and abdominal pain. His initial CT thorax only concluded multiple rib fracture with left hemotorax. He developed delayed diaphragmatic hernia later complicated with MOF and succumbed 13 days later. Methods: 28 yo gentlemen involved in a MVA, presented with complaints of dyspnea, chest pain, abd pain and right LL pain. He was triaged to RZ in view of suspected polytrauma. He was an obese gentleman, fully conscious with normal chest findings. His saturation was 89% on RA which picked up with supplemental oxygen, BP of 107/63 and HR 92 bpm. There was diffuse tenderness over the whole abdomen but no guarding and deformity over the right LL. Surgical team consultation was obtained as FAST scan was inconclusive. He was subjected for CT thorax/CT abdomen/CT pelvis which revealed bilateral lung contusion with left hemotorax, left posterior 5-10 ribs fracture and right acetabulum fracture.

Results: He developed respiratory distress in ward with hypotension 9 hrs after admission (32 hours post trauma) and left sided tension pneumothorax was suspected. Left sided chest tube was inserted and he was intubated. He was subjected for emergency laparotomy and thoracotomy which found traumatic diaphragmatic hernia with perforation to the gastric iatrogenically post chest tube insertion. Subsequently he was transferred to ICU for stabilization however developed sepsis with multi organ failure and succumbed 13 days post trauma.

Conclusions: Traumatic diaphragmatic rupture if a life threatening condition even though the occurrence is quite uncommon. Delayed diaphragmatic rupture may occur as early as 24 hours, or as delayed up to 50 years. In combination with high mechanism if injury, respiratory distress and non specific abdominal pain, this should be suspected.

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**PO_TRA_07_03**

**Factors Affecting Blood Lactate Clearance and Association of Blood Lactate with Mortality in Major Trauma Patients**

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Background and Objectives: Serum lactate has been used as a prognostic biomarker to predict clinical outcome for severe traumatic patients. Several studies have shown that initial blood lactate and lactate clearance are associated with mortality. However, factors affecting blood lactate level and clearance have not been well characterized. Our objective was to determine correlation of blood lactate level and mortality in patients with severe traumatic injuries and demonstrative factors associated with blood lactate level and clearance.

Methods: A prospective observational study was conducted. One hundred Thai adult patients with severe trauma were enrolled from Trauma center level I, Maharaj Nakorn Chiang Mai Hospital. Blood lactate levels at the time of arrival and lactate clearance at 6 hours were measured and recorded. Follow-ups were carried out on hospitalized patients to assess the outcome until discharge.

Results: There were 27 mortalities. The initial and 6-hour lactate level that had demonstrated to be related to mortality were >4 mmol/L (p = 0.020). Decrease in lactate clearance of <10% was also related to higher mortality rate. In comparison, patients who survived had a lactate clearance level ≥10% (p = 0.030). Factors affecting the decrease of blood lactate level were early arrival at the hospital after trauma-30 minutes (IQR 16-35) (p = 0.033), high systolic blood pressure 114 ± 27 mmHg (p = 0.034), high Glasgow Coma Scale 10 (IQR 5-13) (p = 0.037), and high intravenous fluid resuscitation volume 2,400 mL (IQR 1,900-3,500) (p = 0.046).

Conclusions: High initial blood lactate level and low blood lactate clearance in patients with severe traumatic injuries are associated with mortality. Four significant factors which can affect blood lactate level and blood lactate clearance are early arrival at hospital, high systolic blood pressure, high Glasgow Coma Scale and high intravenous fluid resuscitation volume.

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**PO_TRA_07_04**

**The Prognostic Value of Platelet to Lymphocyte Ratio on In-hospital Mortality in Admitted Adult Patients Who Were Suffered by Traffic Accident**

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Background and Objectives: The predictive value of platelet to lymphocyte ratio (PLR) is well known in acute ill condition, but it is unclear in trauma patients.

Methods: This is a retrospective observational study. Primary outcome was in-hospital death. Baseline characteristics, comorbidities, physiologic and laboratory variables were collected. Multivariable Cox proportional hazard modeling was performed to identify independent variables for outcome. Results: 1,522 traffic accident patient were screened and 488 patients were enrolled. The in-hospital death was forty three (8.8%). The median PLR was 115.3 [interquartile range 71.3;181.8]. In-hospital mortality of 1st quartile of PLR (21.5%) was significantly higher than those of 2nd (2.5%) and 3rd quartile (2.5%). Area of under the receiver operating characteristic of PLR for in-hospital survival was 0.82 (95% confidential interval 0.74-0.89), which was greater than those of lymphocyte (0.72, 0.63-0.81). Kaplan-Meier curves showed the significant difference between tertiles (p < 0.001). The Cox regression model showed that 2nd tertile of PLR is independently associated with in-hospital mortality (adjusted hazard ratio 0.30, 0.09-0.98), when compared to 1st tertile. Conclusions: PLR is associated with in-hospital mortality in admitted adult patients who were suffered by traffic accident.

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**PO_TRA_07_05**

**Comparison of Injury Patterns among Cyclists with Alcohol Consumption**

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Background and Objectives: As the cycling population kept growing, the number of alcohol related bicycle injuries increased as well. However, public awareness of severity of bicycle related injuries especially with cycling under the influence is still limited. The purpose of this study was to investigate the influence of the alcohol consumption in bicyclist injuries, including its effects on riding behaviors and clinical outcomes.

Methods: Using data from the Korean Emergency Department-based Injury In-depth Surveillance (EDISS) database from 20 emergency departments from 2011 to 2016, we conducted retrospective analysis. The study subjects had sustained bicycle related injuries age over 18. Covariates included mechanism, place, and time of injury. The outcomes were traumatic brain injury (TBI) incidence, severe trauma EMR-ISS-25, and ED results (operation, ICU admission, and death in ED). The effects of alcohol consumption on these outcomes were analyzed and differences in effects were determined using logistic regression analysis.

Results: Of 24,296 study populations, 1,912 were alcohol related bicycle injury. The alcohol related bicycle injury group had a higher incidence of single vehicle accident (no alcohol 46.4% vs. alcohol 63.7%, p < 0.001). Helmet use were highest in no alcohol young age group (15.0%), but lowest in alcohol young age group. TBI (odds ratio [OR] 2.72; 95% confidence interval [CI], 2.33-3.16), EMR-ISS (OR, 2.26; 95% CI, 2.01-2.53), and ED result (OR, 1.32; 95% CI, 1.09-1.60) showed a significant association between alcohol. Head and neck
Injuries were higher among alcohol group (alcohol 73.7% vs. no alcohol 40.0%, p<0.001). **Conclusions:** Our study showed that the alcohol consumption leads to dangerous cycling behaviors and poor clinical outcomes with high rate of head and neck injuries. Moreover, the results proved that public awareness of the danger of cycling under the influence is still limited. This implies that vigorous education and legislation about danger of cycling under the influence are necessary.

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**PO_MED_03_02**

**Clinical Predictors of Outcome in Patients Presenting with Acute Asthma to the ED in Trinidad—a Perspective From the Developing World**

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**Background and Objectives:** Asthma is a growing public health risk in developing countries. Presenting features of an acute asthmatic attack may provide essential information in predicting severity and the need for hospitalization, and assist in initiating appropriate management. The aim of this study was to assess the predictive accuracy of selected clinical parameters in determining clinical disposition in patients diagnosed with an acute asthmatic attack. **Methods:** A retrospective study was performed at the Sangre Grande County Hospital, Trinidad from July to December 2016. Data was collected from medical records and admission log books, including demographic data, signs and symptoms on presentation, initial vital signs, investigations, treatment, length of emergency department and hospital stay, disposition and outcome. Data was analysed for association using multivariate regression analysis.

**Results:** In total 600 asthmatics were included in the study. Patients were aged from two (2) to 86 years and 53.7% aged more than 18 years. Presenting symptoms included wheeze (67.7%), shortness of breath (36.8%), cough (24.7%), chest tightness (9.8%) and fever (7.8%). Cough (OR 4.703, p=0.001; CI 95%), and fever (OR 1.779, p=0.013; CI 95%) were highly predictive of admission. Admitted patients had higher mean heart rates (126.64 vs. 109.11, p<0.001), higher respiratory rates (26.88, vs. 24.09, p<0.013) and lower oxygen saturation levels (93.15 vs. 97.13, p<0.001). The use of antibiotics in the ED had the highest correlation with admission (OR-11.982, p<0.001; CI 95%).

**Conclusions:** In this study the commonest symptoms of an asthmatic exacerbation were wheeze, shortness of breath, chest tightness and cough. Fever, and use of antibiotics in the ED were highly predictive of admission. Admitted patients were more tachycardic, tachypnoeic and hypoxic. This study suggests that the combination of clinical symptoms, vital signs and standard measures of severity, such as peak flow, can be used to predict admission in asthmatic patients.

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**PO_MED_03_03**

**Modified Vasalva Maneuver in Paediatric Patient with Recurrent Supraventricular Tachycardia**

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**Background and Objectives:** Supraventricular tachycardia (SVT) in children is medical emergency. The fast heart rate can be controlled with drugs or manually using carotid massage or vasalave manoeuvre. The use of drug like adenosine may cause side effects. Modified postural vasalave manoeuvre to control heart rate is more effective (43%) in comparison to the standard manoeuvre (17%). 1) First line and non pharmacological method treating Supra-ventricular Tachycardia in paediatric population **Methods:** A 12 years old boy came for abrupt onset of palpation, giddiness, and chest discomfort. He had history of previous SVT but had no congenital heart disease. Blood pressure was 130/70 mmHg, pulse was 200/min. ECG showed supraventricular tachycardia. Postural modified vasalava was performed with consent where patient was position and asked to blow against 10 cc syringe with the plunger in followed by immediately lifting up both legs to ninety degree in supine position for 15 seconds. Cardiac monitor showed the SVT resolved following the procedure. **Results:** SVT occurs in about 0.1–0.4% of healthy children. Treatment with adenosine may cause unwanted side effects. Postural Modified Valsava method is safe, simple, cost effective and can easily be applied to school age children. The strain was produced when the plunger of 10 cc syringe moved with blowing (equal to 40 mmHg) to create vaginal reflex together with passive legs raising to stimulate vaginal tone and baroreflex. **Conclusions:** In patients with stable SVT, a modified vasalava manoeuvre should be attempted to convert SVT as it is simple, zero cost, well tolerated without serious adverse events.

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BGC Reactivation in Incomplete Kawasaki Disease

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Background and Objectives: Kawasaki disease (KD) is diagnosed based on clinical criteria. One of the important clinical sign that is not included in the classical clinical criteria for KD is reactivation of BGC. I would like to highlight the usefulness of the BGC reactivation for diagnosis of early/incomplete KD (IKD) in this case study.

Methods: A 4 months old baby boy, who presented to emergency department with dry intermittent cough for 4 days associated with fever for 2 day, On Examination, child was well despite his high fever (Temp: C): 40. There was presence of bilateral non-purulent conjunctivitis. BCG scar was inflamed. Macular rashes noted over neck, trunk and back. CNS examination showed brisk reflexes of bilateral knee and non-sustained clonus bilaterally. Otherwise, other systemic examinations were unremarkable. Child was initially treated as presumed meningitis covered with antibiotics. Echocardiogram was done in view of persistent fever despite antipyretic on day 11 of fever, LAD and RCA aneurysm noted. Child was started on IVIG and Oral aspirin. Fever subsided dramatically after the IVIG.

Results: In the case of incomplete KD/early presentation of KD in Emergency Department, a sense of high suspicion and early diagnosis helps to prevent cardiac complication. Coronary artery aneurysms happens untreated patients, and treatment with IVIG reduces the incidence of coronary abnormality. BGC reactivation can be a useful sign that aid in the diagnosis for early KD/incomplete KD supported by a numbers of studies.

Conclusions: This Case report highlights the importance of reactivation of BGC as an early sign suggestive of early/incomplete KD, especially in Malaysia where BCG vaccination is still a part of our immunization schedule. In addition, if child has persistent fever (> 5 days) not responding to antipyretics, KD needs to be suspected.

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PO_MED_03_04

PO_MED_03_05

Non–Traumatic Right Diaphragmatic Hernia Mimicking Tension Pneumothorax

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Background and Objectives: Diaphragmatic Hernia can be congenital defect (80%) or traumatic (0.8-1.6%) where right sided is rare (68%) compared to left (80%). 1 in 20 Non Traumatic Right Diaphragmatic Hernia Is Very Rare Case. 2.Massive Bowel Collection Misleading to Tension Pneumothorax.

Methods: A 71 year old gentleman, known hepatocellular carcinoma presented with shortness of breath, and abdominal distention. He was alert, lethargic, tachypneic, tachycardic with borderline blood pressure. Right lung was hyperresonance with reduced air entry and bowel shadows at right hemithorax. Ultrasound guided pleural tapping followed by thoracostomy drained a foul smelling into whole right thoracic cavity with lung collapse and left mediastinal shift. Ultrasound guided pleural tapping to release the thoracic pressure is lifesaving with caution not to injured the bowels.

Results: Bowel gas collection mimicking tension pneumothorax causing shortness of breath is rare clinical presentation of non-traumatic right diaphragmatic hernia.

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PO_MED_03_06

Demographic Characteristics and Emergency Severity Index Levels of Patients Seen in the Emergency Room of a Developing Sub-saharan African Country

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Background and Objectives: Emergency Severity Index use is still limited in resource poor countries. A significant approach to reduction of high mortality in the emergency rooms is the use of triaging systems to identify patients in need of urgent intervention. Although it is being used in many developing countries, the ESI use and benefit is now being recognized for triaging in the emergency room in developing nations. It has not only helped to reduce mortality, but has also contributed immensely to the management of critically ill patients within the expected time frame. To determine the demographic characteristics and ESI of patients presenting to the the emergency room of Lagos University Teaching Hospital Nigeria.

Methods: A hospital based retrospective study Setting: Lagos University Teaching Hospital adult emergency room. All 3293 patients who presented to the emergency room from 1st January to 31st June, 2017. Demographic characteristics of patients and ESI estimation were extracted from a routine hospital record’s triage sheet. Routine ESI estimation was done by emergency doctors on duty.

Results: Just over half (51.1%) of the patients were males while 48.9% were females. Majority (47.7%) of the patients were < 40 years. Only 22.3% were ≥ 60 years old. Among males 25.1% were elderly while 19.4% were elderly among females. The largest proportion (65.9%) were of ESI 2. There is a significant association between ESI and gender (χ2 = 13.357, p = 0.01) such that most critically ill (ESI-1) were males. There was also a significant association (χ2 = 49.206, p < 0.001) between ESI and age. The most critically ill that had ESI-1 and 2 were elderly. Conclusions: Males and elderly age group are the most critically ill patients seen in emergency room in developing country. Thus, resources should be made available for urgent care so as to prevent high mortality.

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Vomiting to Confusion: A Case of Hyperemesis Gravidarum-induced Wernicke’s Encephalopathy

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Background and Objectives: Hyperemesis gravidarum (HG) is a debilitating condition that may affect up to 2% of all gravidas. Severe HG may result in complications such as dehydration, electrolyte imbalance, and renal impairment. One of the uncommon complications of HG is Wernicke’s Encephalopathy (WE). WE is an acute neuropsychiatry syndrome secondary to thiamine deficiency. Patients with WE usually manifest as a clinical triad of ophthalmoplegia, altered mental state, and ataxia. However, less than a third of the patients fulfil the clinical triad.

Methods: A 31-year-old lady, gravida 2 para 1 at 17 weeks of pregnancy, with underlying hyperthyroidism, presented to the Emergency Department with a 3-day history of confusion. She had been experiencing severe nausea and vomiting for the past 5 weeks, resulting in poor oral intake. In addition to that, she suffered from palpitations and generalized weakness for the past week. The patient appeared lethargic and was unable to follow simple commands. She was poorly hydrated and was tachycardic. She was otherwise normotensive and afebrile. Neck examination revealed a left sided nodular goitre. There was no ophthalmoplegia or ataxia. Other examinations were unremarkable. Initial blood investigations were unremarkable except for a deranged thyroid function test. The Endocrine team suspected WE and prescribed parenteral THiamine, which lead to the gradual resolution of the altered mental state. Retrospectively, the baseline Thiamine level was noted to be low (8.6%). In view of the above, a diagnosis of WE was made available for urgent care so as to prevent high mortality.

Conclusions: We should be diagnose promptly and managed appropriately.

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Severe Hypokalemia–the Neuroendocrine Tumour Effect

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Background and Objectives: Potassium disorders are the most common electrolyte abnormality managed in the Emergency Department (ED). We report a case of a
metastatic neuroendocrine tumour (NET) manifesting as symptomatic severe hyperkalemia from ectopic ACTH secretion. **Methods:** A 57-year-old Chinese lady with no prior medical history presented to our ED with bilateral lower limb swelling, generalised weakness and breathlessness. A cushingoid appearance was noted on physical examination with pitting edema to both knees. Serum potassium was 1.7mmol/L and 12 lead ECG revealed prolonged QTc interval with ST depressions and T wave inversions. IV potassium replacement was commenced for severe hyperkalemia and she was admitted to General Medicine. Inpatient investigations revealed an ACTH-dependent Cushing’s syndrome (CS) with elevated ACTH, urinary and serum cortisol levels. This was secondary to an ACTH-producing lung NET with brain metastasis. The patient underwent gamma knife excision of the cerebellar metastases and VATS segmentectomy of the lung nodule. Her weakness resolved following correction of hyperkalemia. She was started on ketoconazole and ocreotide post operatively for persistent hypercortisolism and underwent bilateral adrenalectomy. However, she died 2 years into treatment secondary to pneumonia. **Results:** Homeostasis of potassium is mainly regulated through renal excretion. IV potassium replacement under close cardiac monitoring following calculation of potassium deficit is recommended in patients with severe hyperkalemia. CS should be considered in patients presenting with hyperkalemia without evidence of inadequate potassium intake, gastrointestinal losses or transcellular shifts. Hypercortisolism exerts mineralocorticoid activity that can mimic hyperaldosteronism. **Conclusions:** Prompt recognition and treatment of severe hyperkalemia in the ED is crucial in preventing potentially life-threatening arrhythmias followed by addressing the underlying etiology.

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**Spontaneous Unilateral Adrenal Haemorrhage: an Atypical Presentation in Emergency Department of a District General Hospital in the United Kingdom—"Normally a Post Mortem Diagnosis Worldwide"**

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**Background and Objectives:** With a meagre incidence of 0.14% to 1.1%, diagnosis of adrenal haemorrhage is infrequently made when the patient is alive. Presenting with variable nonspecific symptoms it is a diagnosis easy to miss in Emergency departments. A high index of suspicion and a timely diagnosis is required to prevent morbidity and mortality. A middle aged man actively haemorrhaging into his left adrenal gland was a near miss when seen in our Emergency Department due to atypical presentation. **Methods:** This case reports a 46 year old Caucasian male presenting to the Emergency Department with a short history of non-traumatic, acute left lower chest and upper flank pain. Initial nonspecific cardiac sounding symptoms, unsetting tachycardia, dynamic rate related ischaemic electrocardiogram changes and raised cardiac enzymes masked the underlying cause. Initial laboratory investigations including renal function and urinalysis were unremarkable with a normal chest X-ray. Bed side point of care ultrasound scan showed a normal measuring abdominal aorta without any active free fluid in the abdomen. Non contrast CT Urinary tract diagnosed a possible left adrenal haemorrhagic cyst. Active bleed from a small adrenal artery branch was confirmed on a contrast enhanced arterial phased CT, which was successfully embolised on CT Angio.

**Conclusions:** Prompt recognition and treatment of severe hyperkalemia in the ED is crucial in preventing potentially life-threatening arrhythmias followed by addressing the underlying etiology.

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**Validation of Existing Scores to Predict Active Bleeding in Patients with Upper Gastrointestinal Bleeding in Hemodynamically Stable Patients**

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**Background and Objectives:** The aim of this study was to validate the usefulness of the Glasgow-Blatchford score (GBS), Modified Glasgow-Blatchford score (MGBS), Pre-Rockall score (PRS), and AIMS65 for predicting active bleeding in hemodynamically stable (HS) upper gastrointestinal bleeding (UGIB) in emergency department patients. **Methods:** UGIB patients who visited for three years were reviewed retrospectively from medical records data were collected total 294 patients. Patients were divided into active bleeding and not-active bleeding group. The GBS, MGBS, PRS, and AIMS65 of each group were calculated. The receiver-operator-characteristic (ROC) curve and area-under-curve (AUC) were calculated to obtain the predictive power for active bleeding of each score. Moreover, patients with SBP > 90 were defined as HS patients, analyzed separately. We analyzed the factors that can predict the active bleeding through multivariate logistic regression. And ROC curves, AUC were calculated using the variables that were adopted as useful factors. **Results:** Of the 294 UGIB patients, 108 were active bleeding and 186 were not-active bleeding. There were 224 HS patients and 70 hemodynamically unstable. Predictive power of the active bleeding of the existing scores, the GBS showed an AUC 0.549, MGBS 0.531, PRS 0.573, and AIMS65 0.545 in all patients. In HS patients, the GBS showed an AUC 0.525, MGBS 0.510, PRS 0.549 and AIMS65 0.502. Multivariate logistic regression showed that lactate, pulse-pressure, and presence of hepatic disease were the significant predictors of active bleeding in all patients, and lactate and pulse-pressure were in HS patients. When the probability of predicting active bleeding was determined through these variables, the AUC was 0.705 in all patients and 0.672 in HS patients, which is higher prediction power than previous score. **Conclusions:** The previous scores predicting the prognosis of UGIB were not helpful in predicting active bleeding. Further study suggests a new score development using factors such as lactate, pulse-pressure, and presence of hepatic disease.

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**A Rare Case of Lingual Abscess Caused by Klebsiella Pneumonia**

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**Background and Objectives:** Tongue abscess is extremely rare presentation nowadays due to the availability of antibiotics and easy access to medical service, despite the tongue is exposed to frequent trauma during mastication or seizures but it still very rare to detect a case with lingual abscess here in Qatar. **Methods:** Case presentation: 34 years old male with no past medical illness presented to the emergency department with complaint of severe tongue pain over the past three days. The patient is unable to eat, or protrude his tongue. He is only able to drink water for the last 2 days. **Results:** Luctuating swelling is palpated in the tongue with marked tenderness. CT scan was requested showing collection in the floor of the mouth. The patient was admitted and operated by maxillofacial team, and incision was done in the tongue with copious amount of pus coming out of the tongue. **Conclusions:** The culture showed profuse growth Klebsiella pneumoniae. The patient was discharged home after 4 days of uneventful stay.

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**Stroke Fast Track Timeliness: the First Year of Experience in a Tertiary Hospital ED**

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**Background and Objectives:** Systemic thrombolysis is the only available therapy of acute ischemic stroke and many hospitals in the world use appropriate stroke fast track pathway for timely management. The emergency department of Yangon General Hospital, a tertiary hospital in Myanmar, also started to use stroke fast track pathway for timely management. The emergency department of Yangon General Hospital is a tertiary hospital in Myanmar, also started to use stroke fast track pathway for timely management in 2016 and this study was done simultaneously to measure efficiency of timely management of acute stroke patient in YGH ED. **Methods:** This was a hospital based descriptive observational study of the detailed time of management of acute stroke in ED. **Results:** This study was conducted on 600 patients presented to YGH ED with sign and symptoms of acute stroke. According to the results of the proportion study, ischemic stroke was still the major proportion of stroke types (54.90%). Only 10.5% of stroke patients arrived to ED within 3.5 hours of symptom onset and the YGH ED could timely managed all stroke fast track cases to get diagnostic CT scan result within 45 minutes of ED arrival.
Midgut Volvulus in an Adult: a Case Report and Literature Review

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Background and Objectives: Midgut volvulus in adults is rare. Small bowel twist may result in complications of obstruction, ischemia, hemorrhage, or perforation. With a midgut volvulus, complications may be life-threatening, and emergent surgical intervention is the mainstay of treatment. Methods: Case report. Results: A 35-year-old man presented acute epigastric pain, nausea and vomiting. Simple abdominal radiograph and blood sampling did not reveal abnormal finding. Computed tomography scan showed the typical findings of midgut volvulus. The patient immediately underwent emergency operation. Exploration revealed twisted small bowels around mesentery. 50 cm of distal jejunum were resected. Conclusions: At the postoperative 1st day, patient developed high fever, hypotension, and anuria and did not respond to inotropic support. Patient died on postoperative day 2.

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Manual CPR vs. CPR Including a Mechanical Chest Compression Device During Transport in OHCA

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Background and Objectives: Mechanical chest compression device is an attractive alternative for use in the pre-hospital environment especially during transport due to provide standard compression in terms of frequency and depth for prolonged periods without any reduction in quality and eliminate the need for paramedics to provide manual compressions, allowing them to focus on other aspect of patient care. The aim of the our study was to compare the performances of mechanical chest compression device and manual compression in an OHCA to find out if the using of mechanical chest compression device is useful during transport. Methods: Data was collected from EMS run sheets for pre-hospital operation information and National OHCA registry for hospital operation and outcomes, which was extracted by medical record reviewers from the Korea Centers for Disease Control and Prevention (CDC). Inclusion criteria: EMS treated patients with OHCAs of presumed cardiac etiology who were older than 16years from Jan. 2014-Dec. 2016. Main exposure: Paramedics used Mechanical chest compression device while transporting the cardiac arrest patients to ED. Main outcome: Primary outcome: Good CPC (1,2) Results: Mechanical chest compression device had no significant better odds of a good neurological recovery and for survival to discharge. In the sensitivity analysis for only the 119 center using high volume of mechanical chest compression device is useful during transport.

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Efficacy of Tenectaplasme in Acute Pulmonary Embolism

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Background and Objectives: Pulmonary embolism (PE) is a life threatening condition which requires thrombolysis followed by anticoagulation in order to achieve hemodynamic stability. There are various thrombolytic agents proved their efficacy in resolving PE. Tenectaplasme being fibrin specific and with less bleeding complications, still is not approved by USFDA in treating PE. There are very few case reports and case studies reporting the use of tenectaplasme in the treatment of acute PE. To study the effectiveness of tenectaplasme in intermediate to high risk pulmonary thromboembolism. Methods: A prospective observational single centre study carried out in a tertiary health care setting over a period of one year. 43 patients of both genders diagnosed with Acute PE were included in the study. All the baseline characteristics were noted and well’s score was given accordingly. All the necessary diagnostic tests were done for confirming the disease and tenectaplasme was given in a weight adjusted manner in hemodynamically unstable patients. Patients were followed up for a period of one year. Outcome was assessed based on the improvement of symptoms. Results: Out of 43 patients 25 (58.14%) were male in which 22 (88%) patients were survived, 3 (12%) patients were dead and 18 (41.86%) were female in which 15 (83.33%) were survived and 3 (16.67%) were dead. The presenting symptoms of the patients include dyspnoea 39 (90.69%), chest pain 9 (20.93%), hemoptysis 2 (4.63%), syncope 8 (18.60%) and isolated hypotension 3 (6.97%). There was a significant reduction in dyspnea (p<0.0001), Right Bundle Branch Block (p=0.0013), hemoptysis (p=0.0013), 30 patients had hypotension at admission and all the survived patients were recovered at discharge. Conclusions: This study supports the use of tenectaplasme in suspected and confirmed cases of pulmonary embolism as there were no serious adverse effects seen during one year of the study period.

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Characteristics of Epidemiology and Clinical Manifestations of Elderly Trauma Patients Admitted at Department of Emergency Medicine: a Hospital- Based Study

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Background and Objectives: Elderly trauma patients suffer worse outcomes than younger. We have no data and prevention program on these patients.Objectives: We reviewed demographic data, mechanisms of injury, trauma scores, and outcome for all elderly trauma patients admitted to Thong That hospital. Methods: We conduct a cross-sectional study and use data from PATOS network for all el-
Improving Pain Management at Hamad General Hospital Emergency Department
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Background and Objectives: Delivering timely pain relief remains a challenge for most emergency department. Pain management is one of the most important component in patient care. Early initiation of pain management at triage improve ED and decrease time to treatment. Treatment of pain does not only improve patient satisfaction, improves mood, decrease length of hospital stay and decreases mortality. Guidelines for pain management in the ED emphasizes the need to address severe pain as quickly as possible within 20-30 minutes of arrival in the ED. Recognition and alleviation of pain should be a priority and start at triage. Our objectives are to improve time to analgesia in patients presenting to ED with moderate and severe pain (pain score NRS >4) within 30 minutes and develop a protocol for nurse initiated analgesia at triage for patients with moderate and severe pain, score >4 if situation allowed which lead to improve patient care, outcome and satisfaction. Methods: Retrospective study initially was conducted to collect data of our current practice. The 2nd step is the implementation of the intervention in mainly Male and Female See and Treat (MST and FST) on 50 patients with moderate and severe pain. Those patients are assessed by the pain doctor or nearest doctor available and provide appropriate analgesia, rectal Diclofenac could substitute IM Diclofenac as it doesn’t take time. Then these patient are reassessed in 30 min. we studied the practice and compared results before and after. The study compares outcomes before and after implementation of pain management protocol these outcomes include proportion of patient receiving analgesia within 30 minutes target and the median time to analgesia administration and median time to relief of severe pain. Results: The results showed an increase about 20% of patients in moderate to severe pain who have received analgesia within 30 mins of their presentation. 90% of the patients received analgesics within 30 to 60 mins of their registration with the remaining 10% of the patients got the analgesia within one hour. Increase in patient satisfaction by 40% and decrease of length of stay of mild to moderate pain. Conclusions: Applying of a clear pain management algorithm and education of the staff lead to improve time to analgesia in patients with moderate and severe pain which improve patient case and satisfaction.

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Evaluating Time Points and Length of Stay For Freestanding Vs. Hospital-based Emergency Departments
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Background and Objectives: Prior research on Freestanding ED (FEDs) has shown faster throughput metrics and shorter length of stay compared to hospital based emergency departments (HBED). No study has evaluated specific time metrics for lab and radiology turn-around times as well as physician operational metrics between these two facilities. Methods: Electronic health information from a large integrated health system was collected for ED encounters from 10/1/17-9/30/18 using data from 5 FEDs and 16 HBEDs. Frequency differences between FEDs and HBEDs for categorical variables were tested using Chi squared. For continuous variables, mean [standard deviation (SD)] was reported and Student’s t-test was used to access the differences between FED vs. HBED patients. All times are reported in minutes. Results: A total of 48,829 encounters from the FEDs and 332,470 encounters from the HBEDs were analyzed. Time from triage start to triage completed was 3.4 (±15.9) at the FEDs and 5.4 (±71.9) at the HBEDs (p<0.001). ED arrival time to time seen by a provider was 15.3 (±24.5) at the FEDs and 21.8 (±99.3) at the HBEDs (p<0.001). Time from lab or imaging order placement to results received was 97.2 (±2,66.5) at the FEDs and 153.5 (±1,251.5) at the HBEDs (p<0.001). ED arrival to patient disposition time was 196.2 (±157.8) at the FEDs and 198.9 (±161.2) at the HBEDs (p<0.001). Total ED length of stay was 217.6 (±107.6) at the FEDs and 353.8 (±371.7) at the HBEDs (p<0.001). Conclusions: FEDs had faster metrics for all time points evaluated during a patients stay in the emergency department when compared to HBEDs.

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**Traumatic Laryngeal Tracheal Injury**

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**Background and Objectives:** The neck region contains a high density of vital organ structures within a relatively small and unprotected anatomic region, making it one of the most vulnerable areas of the body for all types of injuries. As neck wounds result in high mortality rates, management as a first responder on scene is critical for securing the airways and circulation with possibility of any neurological or skeletal damage. **Methods:** The authors report four cases of open traumatic laryngotracheal injury that illustrates the difficulties and challenges encountered in managing these patients on scene and during the retrieval as well as a brief review of the literature on its clinical presentation, diagnosis, and therapeutic approach. Case 1, 2, 3 & 4: A 7 year old girl along with 3 younger siblings assaulted by her biological mother at home in Pulau Mantanani. Patient, her 4 year old sister and 2 year old brother were brought to Hospital Kota Belud where they were intubated orally with limited resources and transferred to Sabah Women and Children Hospital ICU directly. Examination under anaesthesia, Direct laryngoscopy, Telebronchoscopy, wound exploration and repair done under General Anaesthesia. They were extubated 2 days after respective operation. After 3 weeks, trachy were decannulated prior to discharge. Case 4: 8 months old boy, found dead on scene due to bleeding exsanguination and airway compromise secondary to laryngotracheal injury. **Results:** All patients who made it on time for treatment survived the incident and discharge 3 weeks after their respective operation in securing their airways and wound. **Conclusions:** Aside from bleeding control, intubation for airway protection may be at high risk under limited resources but it can be beneficial at extreme occasion where extreme measures are needed. **Corresponding Author:** Boon Kian Chan (kchentch89@hotmail.com)

**Clinical Outcomes and Characteristics of Non-trauma/Trauma Patients in Pediatric Cardiac Arrest in Korea**

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**Background and Objectives:** To our best knowledge, there was no analyzed report of database of national pediatric cardiac arrest for evaluating clinical outcomes and characteristics. The purpose of this study was to evaluate the characteristics and clinical results of trauma/non-trauma in pediatric cardiac arrest patients. **Methods:** We had enrolled 9,160 patients ranged in age from 1 to 19 years-old between 2004 and 2015 in the Korean National Health Insurance Database. The patients were grouped into “trauma” and “non-trauma”. The primary outcomes were mortality rate in 30 days, 6 months and 1 year according to two groups. **Results:** The total number of patients in pediatric cardiac arrest was 9,160, of which 23.3% were in “trauma” and 76.7% in “non-trauma”. A mean age of “trauma” was significantly higher than that of “non-trauma”. The “trauma”, patients in 15-19 years-old was significantly more than any other ages. Generally the mortality rate of “trauma” was significantly higher than “non-trauma” (trauma vs. non-trauma, %: 26.7 vs. 16.3, p<0.001). The mortality rate of short-term (30 days, non-trauma vs. trauma, %: 73.3 vs. 97.6, p<0.001), mid-term (6 months, %: 83.0 vs. 97.4, p<0.001) and long-term (1 year, %: 84.0 vs. 97.4, p<0.001) were shown. Hospitals had more than 500 beds that were accepted significantly more patients than other hospital, regardless of trauma. Long-term hospital-cost were higher in the “trauma” and short-term hospital-cost were higher in the “non-trauma”. **Conclusions:** In pediatric cardiac arrest patients, the “trauma” had higher rates of short-term or long-term mortality and long-term hospital-cost than “non-trauma” (NRF-2017R1A2B100 5037). **Corresponding Author:** Su Jin Kim (icarusksj@gmail.com)

**System-wide Process Changes Improve Procedural Sedation Billing in the Pediatric Emergency Department**

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**Background and Objectives:** Procedural sedation and analgesia (PSA) is common in the emergency department (ED). National data found that at least 80 children are sedated in the ED every day across the United States, accounting for 0.1-1.5 sedation cases per 1,000 visits PSA is complex, requiring close monitoring. PSA in the ED is resource intensive and disrupts regular patient flow. Thus, it is important to recuperate the costs through appropriate billing for both the sedation and procedure. We evaluated our sedation billing to identify the key billing gaps and underwent a quasi-experimental, quality improvement (QI) process to rectify these gaps and improve physician services charge capture. **Methods:** We conducted a cross-sectional study of patients receiving ketamine for PSA in the EDs of two urban, academic, free-standing children's hospitals in our hospital system. Data were divided into pre- and post-intervention groups. We developed a three-component targeted bundled intervention to address missed billing. The first improved documentation standardization; the second, increased timely administrative billing feedback to providers; the third implemented a provider educational initiative. **Results:** 1,602 patients received charges for PSA of the 2,941 PSA procedures in the ED during the study period. The pre-intervention n = 353; post-in-
tervent n = 1,249. Before the intervention, there was a significant difference from month to month in sum charges (p < 0.001). Over time, monthly sum charges increased by $1388.81 (95% CI: 952.57–1,825.06). After the interven-
tion, average ketamine charge summation increased by $1,210.02 per month.

Conclusions: The implementation of a PSA bundle in our ED improved monthly
charge capture by a delta of more than $4,600 from pre to post-intervention. Our
intervention bundle demonstrates that significant billing charge improvement can be
obtained and sustained, with systemic process changes, provider education,
uniform documentation templates, and implementation in the busy ED setting.

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PO_PED_01_07

Assessing Community Understanding and Care Protocols For Student Athletes Who Develop Head Injuries During Contact Sports in Singapore
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Background and Objectives: Pediatric concussion rates around the world have been
increasing, and recent studies have pointed to long-term consequences of untreat-
ed concussions in student athletes. This qualitative study aims to explore the com-

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Assessing Community Understanding and Care Protocols For Student Athletes Who Develop Head Injuries During Contact Sports in Singapore
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Hospital, Singapore

Background and Objectives: Pediatric concussion rates around the world have been
increasing, and recent studies have pointed to long-term consequences of untreat-
ed concussions in student athletes. This qualitative study aims to explore the com-

Conclusions: Development of safe and ef-
effective sedation clinic is possible in resource limited settings. The modified SPS
provider course was positively received by participants and was felt to enhance
their competencies in performing procedural sedation. Continuing education of
health care personnel is required.

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Kids Cafe Related Injuries in Children: a Nationwide Cross-sectional
Study in Korea During 6 Years
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Background and Objectives: The kids cafe is a popular indoor playground in Korea.
There have been no national reports about the kids cafe related injuries in Korea.
This study investigated kids cafe related injuries in Korea registered in a nation-
wide injury surveillance database and analyzed the risk factors for the significant
kids cafe related injury. Methods: A multicenter cross-sectional study was per-
fomed using the Emergency Department-based Injury In-depth Surveillance reg-
istry in Korea between 2011 and 2016. The significant injury was defined as the
injury requiring admission or surgery. A multivariable logistic regression model
was used to obtain the adjusted odds ratios (AORs) for the factors associated with
significant kids cafe related injury. Results: Among 1,537,617 injured patients, we
extracted 891 patients who were injured in kids cafe. Of these, 46 (5.2%) were
admitted and 39 (4.4%) had a surgery. Most common injured anatomic site, injury
type, and mechanism were lower extremity (28.2%), superficial injury (27.2%),
and trip or slip (27.1%), respectively. Among injury inducing factors, a rock
climbing was the only risk factor in a kids cafe that led to significant injury after
adjusting for age, sex, injury mechanism, and anatomic injured sites (AOR: 11.26,
95% CI: 1.04-121.64). Conclusions: The rock climbing in a kids cafe can cause
serious injury to children. Preventive strategies will be needed to prevent injury to
kids cafe.

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PO_PED_01_07

Establishment of the First Ever Pediatric Procedural Sedation Clinic in
Ethiopia
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Background and Objectives: Procedural sedation has become the standard practice
in the emergency rooms in the developed countries but still not well known in re-
source limited countries.There are no general protocols for sedation in the emer-
gency departments in Ethiopia. Painful procedures such as bone marrow aspira-
tion, chest tube, laceration repair, etc are done with only local anesthetics while
the children are crying and wrestling. Objective: as part of the quality improve-
ment of pain assessment and management, we planned to develop a safe and ef-
effective procedural sedation clinic. Methods: We conducted a root cause analysis of
child pain management using the fish bone approach. We conducted repeated Fo-
cus group discussions with stakeholders. A reasonable room was identified, moni-
toring equipment and drugs were provided with the support and collaboration of
emergency medicine, pediatrics, anesthesia, and pharmacy departments. Also im-
portant equipment was donated by American health alliance. In 2011 the Society
for Pediatric Sedation (SPS) developed a sedation provider course which through
important equipment was donated by American health alliance. In 2011 the Society
for Pediatric Sedation (SPS) developed a sedation provider course which through

Conclusions: The sedation clinic started work in July 2015 after officially opened by the chief
officer of College of Health Sciences of Addis Ababa University. The clinic is
owned by the department of pediatrics and overseen and supported by the depart-
ment of anestheisa. A total of 1,800 patients have undergone procedural sedation
over 3 year period. No major complication reported so far. A year later similar
clinic was established in the MRI room. Conclusions: Development of safe and ef-
fective sedation clinic is possible in resource limited settings. The modified SPS
provider course was positively received by participants and was felt to enhance

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“Attitudes Towards Reporting Injuries.” Conclusions seem to be common in rugby, but rare in other sports. A poor to fair understanding of concussion and its long-term sequelae was observed, with the best understanding seen in rugby players. Rugby was the only sport supervised by mediics; coaches and referees supervised the remaining sports. There was a heavy reliance on coaches to decide the severity of an injury and subsequent management in all sports, including rugby despite medice supervision. Reluctance to report injuries was observed in all sports. Conclusions: In this qualitative study, we identified difficulty recognizing concussions and reluctance to report injuries among sports athletes. Further injury-related education in schools should focus on these important areas.

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Variation in Intensive Care Practices For Moderate to Severe Traumatic Brain Injury: a Multi-national Initiative
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Ultrasound in Partial Achilles Tendon Rupture - Falsely Reassuring?
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Background and Objectives: The Achilles tendon is the most frequently ruptured tendon in the human body and the incidence of this injury is increasing. It is important to differentiate clinically between partial and complete ruptures in order to guide effective management. Ultrasound offers a widely available, inexpensive and rapid imaging modality. There is a growing utilization of this imaging technique in Achilles tendon pathology though the evidence of its benefit is up for much debate. The aim of this study is to review the literature surrounding the ef-
developed a retrosternal chest pain, with nauseous sensation. His vitals were stable and conscious, however hypotensive. He was treated as anaphylaxis and given adrenaline. He arrived at our centre about 90 minutes post incident. Upon assessment he was found to have right-sided pleural effusion and cystic ovaries. A portable chest x-ray confirmed the right sided pleural effusion and ascites. A RUSH exam was also performed to ascertain the cause of shock. She was noted to have right pleural effusion, ascites and cystic ovaries. A portable chest x-ray confirmed the right sided pleural effusion. Her blood work was significant for raised white cells, haematocrit, d-dimer and potassium and hyponatremia (WBC: 30.8 NEUT: 26.35; HB: 19; HCT: 0.54; PLT: 532; D-dimer: 1.524; CR: 92; UR: 3.9: Na: 130; K: 6.1; Egrf: 65; Creat: 4; B-hcg: 42). DIFFERENTIALS: Sepsis, Community acquired pneumonia + Effusion + Ascites. Pulmonary embolism, Ovarian hyperstimulation syndrome (OHSS). Conclusions: POCUS was critical in the prompt accurate diagnosis of OHSS in this patient, which made it possible for her to receive adequate resuscitation and intravenous fluids. The decision for thrombolytic therapy was made. Initial investigation revealed an increase in CK and mild leukocytosis. He was admitted in the ward for observation and discharged well. Upon discharge his repeated ECHO reported normal with no regional wall hypokinesia or pericardial effusion. Results: Centipede bite is notorious in causing local inflammation causing intense pain and erythema. However the Scolopendra spp venom has reported to contain toxin that may cause myocardial related complications such as presented above. As there is no antitoxin, supportive management is the mainstay of treatment. Conclusions: Centipede bite rarely causes systemic complications. Thus physician must be vigilance in treating it as it can mimic other life threatening chest pain.

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Severe Soft Tissue Infection Treated with Antibiotics and Hyperbaric Oxygen Therapy
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Background and Objectives: Hyperbaric oxygen therapy (HBOT) has been applied widely to diseases such as CO intoxication, necrotizing soft tissue infection (NSTI), and myofascial syndrome. The first application of HBOT, which was the treatment of lung disease at 2–4 atm in a hyperbaric chamber, was reported by Juodas in 1934. Severe soft tissue infections, such as necrotizing fasciitis, have high mortality and morbidity. The management of these infections is based on antibiotics, and surgical treatment is sometimes necessary. In addition, HBOT is performed to reduce mortality and aid limb salvage. However, the reported effects are contradictory. We report a case of severe soft tissue infection that was successfully treated with antibiotics and HBOT. Methods: This is a retrospective case report. Results: Indications for HBOT vary across different countries. Although the European Committee for Hyperbaric Medicine (ECHM) strongly recommends HBOT for NSTIs, Cochrane Reviews, which is based on randomized controlled trials (RCT), could not conclude whether it supports or opposes HBOT for NSTIs. In this case, no proper prospective study has been conducted on the efficacy of HBOT for NSTIs. Conclusions: However, there is a variety of theoretical evidence in NSTIs. In addition, a retrospective study reported that HBOT decreased in-hospital mortality and improved survival and limb salvage. Although the evidence identified so far for the efficacy of HBOT for NSTIs is not strong, HBOT is believed to be associated with increased survival rates for patients with severe soft tissue infections and with the recovery of the lesion. In our case, the patient experienced improvements in edema and blood circulation in the region after undergoing HBOT. Conclusions: HBOT must be considered as a therapeutic method to provide concurrent therapy for severe soft tissue infections; however, to confirm its efficacy, and a multicenter RCT or prospective cohort study should be conducted.

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Clinical Characteristics of Drowning Patients by Season
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Background and Objectives: Drowning is a major cause of traumatic death. The temperature of the water at the time of the submersion may be related to the prognosis of the patient. We wanted to analyze the clinical differences such as mortality, incidence rate of intensive care unit (ICU) admission, degree of hypothermia and prognosis. Methods: This study included drowning patients over 18 years old who came to an emergency department (ED) located on a Riverside from September 1997 to July 2016. Patients were classified into four seasons: spring, summer, autumn, and winter. Results: Demographic data and clinical outcomes were surveyed. Results: 611 patients were included in this study. In spring, summer, autumn and winter, 164 (26.5%), 215 (34.8%), 128 (20.7%) and 104 (16.8%) patients visited ED by drowning, respectively. The water temperature of Han River was 11.6°C, 23.6°C, 18°C and 2.6°C by season, respectively. In patient general characteristics, rate of alcohol indigestion was the highest in summer. (20.4%, p = 0.016) There was a significant difference in the initial body temperature during the season but there was no difference in blood lactate. (p < 0.05, p = 0.396 respectively.)
Comparison of High Flow Nasal Cannula Oxygen and Conventional Reserve Bag Oxygen Therapy in Carbon Monoxide Intoxication
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Background and Objectives: Although carbon monoxide (CO) poisoning has declined rather than the days of mainly heating and cooking with briquettes, it still frequently occurs during a suicide attempt using briquettes and various fire accidents. Recently, even while was a cook in an enclosed space, CO poisoning occurs frequently and often introduced that to the media. According to the Korea National Statistical Office’s 2014 data, the suicide rate in the Republic of Korea is at the highest level in the OECD. Particularly, suicide by using briquettes is continuously increasing. CO poisoning accidents are often fatal when they occur, and there is a constant need to worry about better treatment plans. For the treatment of CO poisoning, traditional re-breathing mask oxygen administration has been performed, but the use of high-flow nasal cannula equipment has become more active and diversified. High-flow nasal cannula, which is known to have a high level of oxygen supply, positive pressure, easy CO2 washout and little side effects, is expected to have a meaningful effect on the treatment of CO poisoning. However, until now, there have been few studies comparing masked and high-flow nasal cannulae. It is believed that the characteristics of patients such as age and sex, as well as the environmental factors at the time of the poisoning accident, will be related. If the correlation is known through the comparative study, it will contribute to the rapid recovery of the patient, I expect to be able to relieve it. Methods: Patients who came to the ER with CO poisoning were divided into two groups: Conventional oxygen therapy and High-flow nasal cannula. Results: CO washout of patients with high-flow nasal cannula was superior to patients using conventional oxygen therapy. Conclusions: High-flow nasal cannula oxygen therapy was superior to conventional oxygen therapy in the treatment of CO poisoning. Corresponding Author: Hoon Kim

A Five-year Investigation of a Patient with a Heat Illness in the Single Emergency Department For Heat Illness
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Background and Objectives: Heat stroke is a serious heat-related illness characterized by elevated core body temperature and an impaired central nervous system. It is can cause fatal complications, but early diagnosis remains difficult. In this study, we analyzed clinical features and progress and tried to identify characteristics of heat stroke. Methods: In this retrospective observational study, we enrolled 39 heat stroke patients who arrived at one emergency departments which heat illness occurred from 2014 to 2018. The patient is classified as heat exhaustion and heat stroke, we analyzed patients characteristics, exposure factor, clinical feature, treatment method and result. Results: Heat illness occurred in male (69%), 27 patients diagnosed with heat exhaustion and 11 patients with heat stroke. The average body temperature of heat stroke patient was 40.2°C, but 4 patient were not seeing any higher fever. Most of the heatstroke patients showed altered mental status, but two patients showed a alert consciousness. All the patients diagnosed with heat stroke were hospitalized. Five rhabdomyolysis and six acute renal failure occurred during the treatment period of complication, and one patient died despite treatment. Conclusions: Patients with low initial consciousness also had a good prognosis for aggressive treatment. In particular, emergency physician in treating unconscious patients who do not have high body temperature, should consider the possibility of heat stroke and receive detailed medical history. Corresponding Author: CHAN YOUNG KOH

Performance of the Novel 3-level Triage System in a Private Emergency Department in Hong Kong-a Retrospective Pilot Study
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Background and Objectives: In a relatively low service volume emergency department (ED) setting, 3-level triage may be more appropriate than 5-level triage. Yet, there is a paucity of literature evaluating the performance of 3-level triage in such a setting. Our private ED, with an annual census of around 14,000, has introduced a novel triage system which categorizes patients to 3 levels based on a global clinical assessment of patient presentation and vital signs. In this study, we aimed to evaluate the validity, reliability and appropriateness of this 3-level triage system in our setting. Methods: We conducted a retrospective study on a random sample of 100 ED cases (10 Category 1, 20 Category 2 and 70 Category 3 cases). We assessed the criterion validity by blinded adjudication by an experienced nursing manager. For outcome validity, we compared the proportion that requires hospital and ICU admission of patients of different triage categories. Intra-observer and inter-observer reliability were determined by asking the same nurse to triage the same patient at least 4-weeks after the initial encounter and asking a different nurse to give a triage rating based on the triage notes, respectively. We compared the triage ratings using kappa statistics. Results: There was substantial agreement between the adjudicator and the triage nurse (k=0.763;95% CI, 0.61-0.86). The over-triage and under-triage rates were 6% and 7% respectively, which are considered acceptable. Both the hospital admission rates and ICU admission rates were significantly higher for patients of higher triage category (Cat 1 90.0%; Cat 2 47.6%; Cat 3 30.1%, p<0.001). Both intra-observer (k=0.642, 95% CI 0.50-0.78) and inter-observer reliability (k=0.630, 95% CI 0.48-0.78) were moderate. Conclusions: The 3-level triage system appears to have good validity and reasonable reliability in a private ED setting. Further prospective study, preferably with real time triage rating by different assessors, is warranted.

Spontaneous Simultaneous Bilateral Patellar Dislocation
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Background and Objectives: Bilateral patellar tendon rupture is extremely rare, with approximately 50 cases reported in English literature. It is usually associated with systemic diseases or medication side effects, and in the absence of these predisposing factors and also the rarity of the injury, clinical suspicion is usually low for this injury. It is reported that up to 38% of patellar tendon ruptures are misdiagnosed initially, so a focussed history and clinical exam is important to facilitate early repair. Methods: We present the case of a 47 year old man who was playing football on an artificial pitch and on making a challenge to an opposing player, lost his footing and landed onto the ground with both his knees in a forced hyper-flexion position. He noted immediate pain over his anterior knee, followed by a tearing sensation and noted that both his patellae moved superiorly towards his mid-thigh. He was unable to stand due to pain and was brought to hospital by ambulance. On examination, he had swelling to the superior aspect of both knees, with a loss of fullness at the anterior knee. There was a positive effusion on both bulge and patellar tap tests. Of note, he was unable to straight leg raise and could not initiate knee extension bilaterally. A presumptive diagnosis of bilateral patellar tendon rupture was made. Results: Plain radiography of both knees revealed bilateral high-riding patellae. Subsequent ultrasound showed ruptures of bilateral proximal patellar tendons with associated avulsion fractures. He underwent surgical repair followed by subsequent rehabilitation. Conclusions: Bilateral patellar tendon rupture is rare but should be considered in a patient presenting with sudden bilateral knee pain. The straight leg raise is most useful clinical examination tool to diagnose such an injury. Prompt recognition is vital, as a delay to surgical repair can result in poorer outcomes.

Reduction of Unnecessary IV Cannulation in the Emergency

Department
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Background and Objectives: A quality improvement project aiming to reduce unnecessary IV Cannulation in the Middlemore Hospital Emergency Department. The aim specifically was to reduce the “just-in-case” cannulas and cannula insertion as a method of obtaining blood samples. Methods: The participants all adult patients presenting to Middlemore ED, during this study period admitted to our assessment or waiting room areas–these tend to be to low to moderate level acuity patients (Triage category 3 and 4). The intervention was a cultural shift awareness campaign implemented by word-of-mouth, posters, nurse educators and handover reminders/education. An Audit of cannulation rates was performed in April 2018 and then repeated following the intervention using the same methodology in September 2018. Data was collected by observing the number of Cannulas and bloods requested by nurses and performed by our Phlebotomy service, who perform the vast majority of cannulations in the ED. Thus the study aimed to capture the majority of “routine” cannulations. The study was performed in real-time and has limitations to the data collection/audit method. Results: The result was a 15% reduction in cannulation rates overall. This likely has an association with added benefits such as a reductions in cost, staff time, cannula related infections and patient discomfort. Conclusions: In Conclusion I feel this is a cost effective intervention which is easily applicable to other Emergency Departments and it provides a range of benefits.
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Factors Affecting Mortality in Patients Admitted to the Hospital by Emergency Physicians Despite Disagreement with Other Specialties
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Background and Objectives: To define the factors affecting mortality in patients admitted to the hospital by emergency physicians (EPs) against in-service departments’ decision. Methods: This is a retrospective analysis of a prospectively collected data of ten consecutive years (2008-2017) of an emergency department of a university medical center. Adult patients (> = 18 years old) who were admitted to the hospital by EPs against in-service departments’ decision were enrolled into the study. Significant factors affecting mortality were defined by backward logistic regression model. Results: 369 consecutive patients were studied, 195 (52.8%) were males. The mean (SD) age was 65.5 (17.3) years. The logistic regression model showed that significant factors affecting mortality were intoxication (p < 0.001), low systolic blood pressure (p = 0.006), increased age (p = 0.013), and having a comorbidity (p = 0.024). There was no significant difference between EPs’ primary admission diagnosis and patient’s final primary diagnosis at the time of disposition from the admitted departments (McNemar-Bowker test, p = 0.45). 96% of the primary admission diagnoses of EPs were correct. Conclusions: Intubation, low systolic blood pressure on presentation, increased age, and having a comorbidity increased the mortality. EPs admission diagnoses were highly correlated with the final diagnosis. EPs make difficult admission decisions with high accuracy, if needed.
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serum lactate level > 2 mmol/L by MEWs, qSOFA, SIRS and SOFA by AUROC was 0.659 (95% CI, 0.557-0.762), 0.608 (95% CI, 0.497-0.719), 0.448 (95% CI, 0.324-0.571) and 0.722 (95% CI, 0.611-0.833) consequently. The cut off of maximized Youden’s index of SOFA score at least 4. At these cutoffs, the sensitivity and specificity to predict serum lactate level > 4 mmol/L were 65.5% and 71.0%. We found poor correlation between clinical score and initial lactate. Conclusions: SOFA score more than 4 is a fair predictor for high serum lactate level. Development of new clinical scores to predict high serum lactate level may be useful in reducing unneeded laboratory investigations.

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Prediction of High Serum Lactate Level by SIRS, QSOFA, MEWs and SOFA

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Background and Objectives: Serum lactate level is a pathological marker of poor tissue perfusion in sepsis. The surviving sepsis campaign guideline recommends a follow up of lactate level to normalization after treatment. However, in patients with sepsis, there is no clear evidence which severity level of septic patients should be examined blood lactate. We hypothesized clinical score qSOFA, SIRS, MEWs or SOFA can predict serum lactate level. Methods: This was a prospective, observational study. Patients who visited the emergency department with suspected sepsis were included clinical parameter and serum lactate were measured. Linear correlation between serum lactate level and clinical scores and area under receiver operating characteristic (AUROC) curve included sensitivity and specificity of clinical scores to predict high serum lactate level were performed. Results: 191 patients were enrolled, of which 103 patients were diagnosed with sepsis (sepsis-related organ failure assessment (SOFA) score ≥ 2). Result of serum lactate less than 2 mmol/L were 80 patients (41.9%), between 2-4 mmol/L 82 patients (42.9%) and more than 4 mmol/L 29 patients (15.2%). The prediction of serum lactate level > 4 mmol/L by MEWs, qSOFA, SIRS and SOFA by AUROC was 0.659 (95% CI, 0.557-0.762), 0.608 (95% CI, 0.497-0.719), 0.448 (95% CI, 0.324-0.571) and 0.722 (95% CI, 0.611-0.833) consequently. The cut off of maximized Youden’s index of SOFA score at least 4. At these cutoffs, the sensitivity and specificity to predict serum lactate level > 4 mmol/L were 65.5% and 71.0%. We found poor correlation between clinical score and initial lactate. Conclusions: SOFA score more than 4 is a fair predictor for high serum lactate level. Development of new clinical scores to predict high serum lactate level may be useful in reducing unneeded laboratory investigations.

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PO_CCM_02_03

Clinical Topic Review Comparing the Risk of Catheter Related Infections Between Femoral Subclavian or Internal Jugular Site For Central Venous Catheter Insertion

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Background and Objectives: Introduction: Central venous catheterization in critically ill patients in ED are commonly performed using internal jugular (IJ), femoral or subclavian (SC) route. The difference in catheter related blood stream infections (CRBSI) and tip colonization are common arguments to support IJ site selection over others. However, currently with the utilization of ultrasound-guided procedures and care bundles, the association between the infectious complications and the site of CVC is debatable.Objective: This review was aimed to appraise literature on the catheter related risk of infectious for comparing femoral CVC to IJ or SC in ED or ICU. Methods: Cochrane Central Register of Controlled Trials, MEDLINE, EMBASE, and Google Scholar were searched up to May 2018 for relevant RCTs, meta-analysis and systematic reviews. Two reviewers independently assessed eligible studies and abstracted data using predefined data fields. Results: From 753 potentially relevant studies, three RCTs and one study reporting longitudinal database from 2 RCTs were included in this review. Four RCTs compared IJ to Femoral site, one compared femoral to SC and one compared all three sites. The risk ratio for CRBSI, femoral to IJ was RR 1.03 (0.52, 2.07; p=0.93) and femoral to SC was RR 2.43 (2.14 to 13.47; p=0.004). The risk of CRBSI measured in incidence per 1000 catheter days were comparable between three sites. The risk ratio for CRBSI, femoral to IJ was RR 1.03 (0.52, 2.07; p=0.93) and femoral to SC was RR 2.43 (2.14 to 13.47; p=0.004). The cut off of maximum Youden’s index of SOFA score at least 4. At these cutoffs, the sensitivity and specificity to predict serum lactate level > 4 mmol/L were 65.5% and 71.0%. We found poor correlation between clinical score and initial lactate. Conclusions: With a good understanding of the limitations of blood gas analysis and when integrated with careful clinical assessment, VBG analysis provides adequate information to guide initial resuscitation in critical illness.

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PO_CCM_02_05

Non-occlusive mesenteric ischemia in Intensive Care Unit: a Case Series Study

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Background and Objectives: Non-occlusive mesenteric ischemia (NOMI) is a poor prognosis and high mortality, so early detection and intervention are necessary. In this study, we aimed to clarify the characteristics and trends of the patients who diagnosed as NOMI in the mixed medical intensive care unit of Tokyo Medical University Hospital. Methods: This cross case study evaluated 14 adult patients (age ≥ 20 years) admitted to our institution who were diagnosed as NOMI between August 2015 and October 2018. We examined the characteristics and trends by accumulating their data (age, sex, symptoms of onset, past history, admission type, ward type, time from onset to intervention, and treatment method). Results: The median age was 78 years. There were 10 males (71%) and 4 females (29%) for gender. In past history, 6 cases which occurred after cardiovascular operation (40%), 5 cases of Chronic Kidney Disease (33%), 4 cases of atrial fibrillation (27%), and 4 cases of diabetes (27%). In admission type, 9 cases (64%) were medical emergency admission and 5 cases (36%) were surgical admission. The onset symptoms were 6 cases (40%) of low blood pressure, 3 cases (20%) of abdominal distension and the others. 10 cases developed in the intensive care unit and 4 cases developed in the general ward. The time from onset to intervention is 5 hours at the intensive care unit, and 9 hours at the general ward. In treatment method, laparotomy was selected for 13 patients and intensive care therapy for 1 patient. Conclusions: Patients in general wards had a delayed onset time and tended to take time to intervention. These patients tended to require extensive intestinal resection. This may indicate that the range of intestinal necrosis has expanded since its long time from onset to diagnosis. In severe cases, abdominal symptoms may not be useful in early diagnosis.

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PO_CCM_02_06

Five-year Trend in 30-day Mortality of Patients Admitted From the Emergency Department to the Intensive Care Unit in a Welsh University Hospital: a Retrospective Observational Study

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Background and Objectives: Emergency departments (ED) contribute 26% of all intensive care unit (ICU) admissions of which 75% are direct and 25% indirect (Simpson, 2005). Such ICU admissions have been steadily increasing over recent years with mortality as high as 32.7% (Simpson, 2005). We sought to investigate five-year trends in 30-day risk-adjusted mortality for ED-ICU admissions, in the University Hospital of Wales. Methods: This was a retrospective cohort study of consecutive patients, aged ≥ 18-years admitted from the ED to ICU of a tertiary university hospital in Cardiff from May 2012 to April 2017 (five years). The primary outcome was all-cause, risk-adjusted 30-day mortality. Data were analysed using univariate and multivariate logistic regression. We applied a machine learning algorithm (Super Learner) to build a model to predict 30-day mortality using 42 admission variables. Results: Of 750,000 ED attendances, 1,569 patients were admitted to ICU from the ED. Unadjusted 30-day mortality peaked at 28.7% in the year 2014/2015. Analysis after adjusting to Apache II score shows that the mortality differences across the years are not explained by admission variables.
The peak in mortality coincided with a major ED refurbishment. However, by using Super Learner, mortality risk is indeed changed by additions in admission variables. **Conclusions:** Administrative data analysis shows an increase in mortality in 2014/2015 for patients admitted from ED to ICU.

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PO_SEP_02_01

**Clinical Predictors and Outcome Impact of Community Onset Polymicrobial Bloodstream Infection**

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**Background and Objectives:** Very few studies have characterized community-onset polymicrobial bloodstream infections (BSI). We determined the incidence, risk factors and outcomes of polymicrobial BSI as compared with monomicrobial BSI in a cohort of patients with community-onset BSI. **Methods:** In this prospective cohort study, we enrolled consecutive patients with laboratory confirmed BSI who admitted to two tertiary EDs in Taiwan from between January 1, 2015 and December 31, 2016. We compare demographic, comorbidity, and sources of infection between polymicrobial and monomicrobial BSI. Subsequently, we identified independent clinical predictors with the multivariate logistic regression model analysis. Internal validation was performed using 10-fold cross validation. We assessed the independent impact of polymicrobial BSI on survival by a propensity score weighting method. **Results:** Among 1,166 patients with community-onset BSI, a total of 133 (10.9%) episodes polymicrobial BSIs occurred. Anaerobe, Klebsiella pneumoniae, Pseudomonas aeruginosa, Acinetobacter baumannii, Enterococcus, and Candida spp. were the most common isolated microorganisms in polymicrobial BSI. Polymicrobial BSIs were associated with an increased 90-day mortality rate (OR 2.20, 95% CI: 1.98-2.60). Clinical variables predicted anaerobic BSI with moderate discrimination (c statistic = 0.78). Significant predictors included biliary tract infection, nosocomial infection, nursing home resident, stroke, and afibrile presentation. **Conclusions:** Polymicrobial BSI occurs approximately 1 in 10 episodes of community-onset BSI and are independently associated with excess mortality. Clinical predictors identified in this study may help guide the prescription of empiric broad-spectrum antibiotics.

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PO_SEP_02_02

**Hyperphosphatemia as an Independent Prognostic Factor in Sepsis Patients**

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**Background and Objectives:** Identifying the prognostic factor in patients with sepsis may be the first step to recognize patients who may be worse and take appropriate action to improve outcome. This study was performed to investigate the effect of phosphate level on the mortality of sepsis patients. **Methods:** This study is retrospective analysis of patients with sepsis. The criteria of hypophosphatemia and hyperphosphatemia were divided by 2.5 and 4.5, respectively, and the difference of 28-day mortality was analyzed according to each group. The survival curves of the three groups were plotted using the Kaplan-Meier method, and multivariable Cox proportional hazard regression analysis was performed to evaluate the independent association of phosphate level with 28-day mortality. **Results:** A total of 3,173 patients were included in the study and the overall mortality rate was 21.9%. The proportion of patients with hyperphosphatemia was higher in the non-survivors than in the survivors (31.4% vs. 14.4%). Hyperphosphatemia group had a higher mortality rate than the normophosphatemia group (38.1% vs. 19.8%), and hyperphosphatemia was an independent prognostic factor in multivariable Cox proportional hazards regression analysis (hazard ratio, 1.27; 95% confidential interval 1.05-1.54). **Conclusions:** Hyperphosphatemia is associated with 28-day mortality in sepsis patients and can be used as an independent prognostic factor.

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PO_SEP_02_03

**Five-Year Trend in 30-day Mortality of Patients with Sepsis Admitted From the Emergency Department to the Intensive Care Unit in a Welsh University Hospital: a Retrospective Observational Study**

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**Background and Objectives:** Sepsis is the leading cause of death in the hospital, and the incidence is increasing partly to the growing prevalence of chronic conditions in the aging population. Accurate identification of sepsis epidemiological trend is important in order for a more targeted management and policy change. We investigated five-year trends of sepsis for patients admitted from ED to ICU in a tertiary university hospital in Cardiff. **Methods:** We conducted a retrospective cohort study of consecutive patients aged ≥18-years with sepsis admitted from ED to ICU from May 2012 to April 2017 (five years). Sepsis was defined according to Sepsis 3.0 criteria. The primary outcome was the 30-day all-cause mortality. Data was analysed using MedCalc and Microsoft Excel. **Results:** Of 750 000 ED attendances, 1569 patients were admitted to ICU and 393 had sepsis. 248 (66.5%) had septic shock. The overall 30-day mortality for sepsis was 97/393 (24.6%) and for septic shock was 84/248 (33.4%). **Conclusions:** Five-year incidence of sepsis and septic shock are static. However, mortality rates have an upward trend.

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PO_SEP_02_04

**Survival Impact and Clinical Predictors of Anaerobic Bloodstream Infection-A Prospective Cohort Study**

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**Background and Objectives:** Sepsis is the leading cause of death in the hospital, and the incidence is increasing partly to the growing prevalence of chronic conditions in the aging population. Accurate identification of sepsis epidemiological trend is important in order for a more targeted management and policy change. We investigated five-year trends of sepsis for patients admitted from ED to ICU in a tertiary university hospital in Cardiff. **Methods:** We conducted a retrospective cohort study of consecutive patients aged ≥18-years with sepsis admitted from ED to ICU from May 2012 to April 2017 (five years). Sepsis was defined according to Sepsis 3.0 criteria. The primary outcome was the 30-day all-cause mortality. Data was analysed using MedCalc and Microsoft Excel. **Results:** Of 750,000 ED attendances, 1569 patients were admitted to ICU and 393 had sepsis. 248 (66.5%) had septic shock. The overall 30-day mortality for sepsis was 97/393 (24.6%) and for septic shock was 84/248 (33.4%). **Conclusions:** Five-year incidence of sepsis and septic shock are static. However, mortality rates have an upward trend.

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Statins Improve the Long-term Survival in the Survived Sepsis Patients: a Nationwide Cohort Study in Taiwan

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Background and Objectives: Most sepsis patients died during their first episode and the long-term survival post discharge was low. Major adverse cardiovascular events and repeated infections were regarded as the major causes. No definitive medications were proven to effectively improve the long-term outcome. We aimed to examine the benefit of statins on the long-term outcome of survived sepsis patients. Methods: Between 1999 and 2013, a total of 220,082 patients with the first episode of sepsis hospitalization were included and 134,448 ones (61.09%) survived to discharge. The survived patients who subsequently had statins use of >30 cumulative defined daily doses (cDDDs) post discharge were defined as the statin users. Participants: After propensity score matching of 1:5, a total of 7,356 and 36,780 survived patients were retrieved as the study (statin-users) and comparison cohort (non-statin users), respectively. The main outcome was the long-term survival post discharge.Interventions: HR with 95% CI was calculated using the Cox regression model to evaluate the effectiveness of statins with further multivariate analysis. Results: The identified 1,166 episodes of BSIs during the 2-year study period, of which 61 (5.2%) were anaerobic BSIs. Clinical variables predicted anaerobic BSI with moderate discrimination (optimism corrected C statistic = 0.75). Significant predictors included metastatic cancer (OR 6.03, 95% CI 2.78-13.09), intra-abdomen infection (OR 3.92, 95% CI 1.47-10.45), liver abscess (OR 2.65, 95% CI 1.26-5.62), skin and soft-tissue infection (OR 2.40, 95% CI 1.13-5.08) as the positive predictors. Urinary tract infection (OR 0.15, 95% CI 0.04-0.62), diabetes mellitus (OR 0.38, 95% CI 0.18-0.78), or thrombocytopenia (OR 0.33, 95% CI 0.18-0.60) were identified as the negative predictors of anaerobic BSI. Anaerobic BSI were not associated with worse prognosis in either adjusted (HR 1.28, 95% CI 0.61-2.67) or PS-matched analysis (HR 1.40, 95% CI 0.44-4.41). Conclusions: Anaerobic BSI accounted for a significant proportion (approximately 1 in 20) of community-onset BSI. The apparent adverse outcome associated with anaerobic BSI may be explained by the underlying comorbidity, high risk infection site, and inadequate initial antibiotics. Clinical predictors identified in this study may help guide the prescription of empiric anti-anaerobe antibiotics.

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PO_SEP_02_05

Contribution of Sequential Organ Failure Assessment Score For Mortality-Early Identified Sepsis vs. Late Identified Sepsis

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Background and Objectives: Sepsis is identified using sequential organ failure assessment (SOFA) score according to sepsis 3. Some parameters of SOFA are available rapidly, but others need certain period to be determined. Therefore, sepsis can be divided into 2 category-early identified (EI) sepsis and late identified (LI) sepsis. The present study aims to compare the mortality between EI sepsis and LI sepsis. Methods: This is a retrospective chart review, which enrolled emergency department (ED) patients who were identified as sepsis during a consecutive 2 months. EI sepsis was defined as sepsis which was diagnosed at the emergency department, hypochloremia was significantly associated with mortality. Results: In total, 353 sepsis patients were enrolled. Mortality was 14.4% (n=51). 180 patients were identified with EI sepsis and remaining 173 patients were as LI sepsis. Mortality was significantly higher in EI sepsis (21.7%, n=39) than that of LI sepsis (6.9%, n=12, p<0.0001). SOFA score was significantly higher in EI sepsis (4.6±2.4) than that of LI sepsis (2.9±1.3, p<0.0001). Conclusions: Mortality of EI sepsis was significantly higher than that of LI sepsis. Contribution of SOFA parameters for mortality seems not to be uniform.

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PO_DIS_02_01

The Willingness of Nurse Practitioner in Out-of-Hospital Disaster Medical Care and Associated Factors: Single Hospital Survey

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Background and Objectives: Nurse practitioner (NP) was noted as an untapped resource that can provide care for a vulnerable population during disaster in previous study. But there is few study about NP participating in out-of-hospital disaster
medical care (OHDMC). We want to investigate the willingness of participation and associated factors. **Methods:** An anonymous survey questionnaire which was designed by disaster experts was sent to all NPs in the hospital where author works. Base on theory of planned behavior, 16 proposed factors were listed in the questionnaire, including age, gender, highest education level, marriage status, family member who lives together, number of children, year of working experience, certification status, current clinical unit, the understanding level of OHDMC, past disaster medicine education, opinion of necessity of NP participation, opinion of hospital working hour rule, opinion of hospital reward, opinion of hospital dispatch of medical staff to disaster scene, and opinion of hospital expenditure on dispatch. Willingness of participation in OHDMC was rated from 1 (very unwilling) to 5 (very willing). The correlation between each proposed factor and willingness level was evaluated with ANOVA or independent sample T Test depending on the distribution. **Results:** 104 questionnaires were sent and 86 NPs completed the survey. Several factors were found significantly (p < 0.05) correlated to higher level of willingness, including no family member who lives together, year of working experience between 1 to 8 years, higher understanding level of OHDMC, and belief of necessity of NP participation in OHDMC. **Conclusions:** NP participants of OHDMC might be more in selected demographic characteristics revealed in this study. To increase the willingness of NP in OHDMC, promotion of disaster medicine education may be considered. **Corresponding Author:** Wei-Kuo Chou (wkchoi13@gmail.com)

**PO_DIS_02_02**

**Functional Exercise vs. Written Test on Evaluating Disaster Core Competency: Same or Different?**

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**Background and Objectives:** Functional exercise is a useful tool to validate participant’s performance. Written test is also widely used to evaluate student’s learning outcome. We want to know whether the evaluation results from these two tools are same or different, especially in different core competency domains. **Methods:** Participants were enrolled in a one-and-half day disaster training course. The course consisted of didactic lectures and small group practice. Participants were asked to do a written test and participate in a functional exercise after the course. The training course, written test, and functional exercise were designed based on 6 core competency domains which were command, control, coordinate, safety and security, communication, assessment and planning, patient care, and resource management. The results of functional exercise evaluation and written test were evaluated with Pearson correlation in each core competency domain. **Results:** A total of 205 participants were enrolled, including 38% nurses, 30% medical and nursing students, 13% physicians, 12% emergency medical technicians, and 7% allied health personnel. In domain of assessment and planning, functional exercise evaluation result was significantly negatively correlated with written test result (R = -0.65, p < 0.05). In other 5 core competency domains, functional exercise evaluation result was not significantly related to written test result (p > 0.05). **Conclusions:** The study result showed no significantly positive correlation between functional exercise evaluation and written test results. It indicated that functional exercise and written test can test different aspect of participants’ performance. We suggested that both evaluation method should be used to evaluate disaster core competency performance. Functional exercise cannot be substituted by written test. **Corresponding Author:** Wei-Kuo Chou (wkchoi13@gmail.com)

**PO_DIS_02_03**

**Emergency Department Visits by Elderly Patients in Bangkok, Thailand Before and After Severe Flooding in 2011**

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**Background and Objectives:** Thailand experienced major floods in 2011, causing widespread damage to Bangkok and nearby provinces, with subsequent impacts on the minds and bodies, especially the weak and the elderly, and resulting in an increased use of the emergency department (ED). This study aimed to compare the prevalence of diseases and characteristics that led older adults to access the ED. Two periods were investigated: the period before flood (BF), and after flood (AF), in Bangkok 2011. **Methods:** This study was a retrospective chart review. Data were taken from electronic medical records (EMRs) in the period BF from August 5, 2011 to October 4, 2011, and AF from October 5, 2011 to November 25, 2011. All patients aged 60 years and over who came to the ED were enrolled. Data were compared between BF and AF including characteristics, diagnoses and adverse outcomes, which were defined as ED revisits and prolonged hospitalization (> 7 days). **Results:** Our study had 388 patients in BF group and 401 patients in AF group. Most of them were female in both groups [BF group 230 (59.3%) vs. AF group 235 (59.6%)] The AF group had more patients in the 60-74 years age group than BF group [AF 275 (68.6%) vs. BF 173 (44.6%) p < 0.01]. The AF group were more likely than BF group to visit ED between 16:01-00:00 [AF 175 (43.6%) vs. BF 141 (36.3%) p = 0.04]. The AF group complained more about “muscule pain” than BF group [AF 11 (2.7%) vs. BF 7 (1.8%)]. There was no difference in adverse outcomes between groups. **Conclusions:** After flood in Thailand, ED saw an increase in visits by elderly patients, who mostly came in the afternoon and complained most about muscle pain compared with BF. This research highlights the need to prepare medical personnel for when older people come to the ED during future disasters. **Corresponding Author:** Thitiwat Pakspod (thitiwatkarm@gmail.com)

**PO_DIS_02_04**

**Activities of DMAT in Hazardous Areas**

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**Background and Objectives:** In 2011, due to the nuclear disaster caused by the Great East Japan Earthquake, Japan DMAT could not do enough activities. We surveyed what the Japan DMAT has in recognition of activities in hazardous areas. **Methods:** We asked to Japan DMAT members about the activities in 14 dangerous areas actually occurred in the Great East Japan Earthquake and compared with non DMAT members. **Results:** Compared to general medical staff, DMAT members are more cautious due to activities in hazardous areas such as nuclear disasters and explosion terrorism sites, they are apt to escape young medical personnel from dangerous areas, to withdraw their regular duties by giving priority to children It was more tolerant to do. In addition, the compulsion of duty in the dangerous area replied that both were similarly unacceptable. **Conclusions:** DMAT members and general healthcare workers have found that there is a difference in thinking on activities in dangerous areas. This seems to be the result of the DMAT members strongly taking the importance of protecting themselves in education and training in activities in dangerous areas. However, from this survey, it was found that there was a possibility that medical staff did not perceive (qualify) the activity self-restraint. **Corresponding Author:** JIRO SHIMADA (jshimada3@gmail.com)

**PO_DIS_02_05**

**Ramp Up Response to Pandemic Activation**

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**Background and Objectives:** The emergence of infectious disease globally has highlighted the importance of early preparation to handle a large number of cases in a pandemic. Planning for a widespread pandemic with unpredictable impact is challenging but yet is an essential part in pandemic preparedness. Tan Tock Seng Hospital is the designated national hospital to handle infectious outbreak. A National Screening Centre was build to handle a large influx of patients during a pandemic. To streamline operational effectiveness and facilitate ground command and control, Emergency Department will lead Screening Centre operations in a large scale outbreak. **Methods:** Judicious planning involves several components such as manpower resourcing, equipment and consumables ramp up, defining clinical flow, engaging stakeholders, staff familiarization and orientation. **Results:** Manpower resourcing includes having a pre-defined core group of clinicians, allied healthcare staff, ancillary support staff. The core group of staff must be certified competent in pre-defined relevant skills. Pre-configured plans for equipment and consumables ramp up includes the availability, storage and deployment of equipment and consumables in such a scenario. It is critical to have forward plans pertaining for re-supply of medication and consumables. Clinical flow mainly focuses on segregating low risk and high risk patients. To facilitate ad hoc categories, flexibility is provided. The operational flow includes facilitating patient
The Changes of Exercise Participants’ Self-confidence After a Full-scale Exercise
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Background and Objectives: Full-scale exercise is a proxy of disaster. In order to simulate disaster, full-scale exercise may pose certain level of difficulty to the participants. We wanted to investigate the change of exercise participants’ self-confidence after full-scale exercise. Methods: A full-scale exercise was conducted this year with the scenario of earthquake. The exercise was designed based on 11 important disaster core competencies, including incident management system, recognition/notification/initiation/data collection, communication, resource management, public health and safety, patient triage, surge capacity/capability, patient identification and tracking, transportation, clinical consideration, and psychosocial issues. 33 doctors and nurses participated in the exercise, and they were asked to treat 100 patients for 3 hours in tents with limited outside resources, manage their own logistics (including dozens of medication and medical supplies), cook their own meal, and sleep in tents. Participants were invited to fill out a pre-exercise survey to evaluate their self-confidence of 11 core competencies. After exercise and discussion, they were invited again to reevaluate their self-confidence. Results: 35 participants, including doctors and nurses, finished the pre- and post-exercise surveys. Paired T-test was used to compare the pre- and post-exercise score of confidence. Results showed confidence increased significantly within all 11 core competency domains (p<0.05). Kruskal-Wallis test was used to compare the difference among these 11 core competencies but showed no significant difference (p=0.724). Conclusions: Despite facing difficulty and frustration in full-scale exercise, participants can significantly increase their self-confidence of disaster response.

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Study of Factors Related to Completion of Public CPR Education
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Background and Objectives: In Korea, CPR education for lay-person was established by the law, the emergency medical Act in 2008. For the effectiveness, the law announced public transport drivers, crew members, health and physical education teachers, policemen, and industrial safety officer as educators. Through the past 10 years, the education had been performed by regional governments with a goal of 2,000 educators per 100,000 population in a year. We have reviewed the influence of nationwide CPR education policy. Methods: We analyzed Community Health Survey, performed by Korean Centers for Disease Control and Prevention in 2016. The nationwide survey was carried out targeting adults standardized on a regional basis by computer assisted personal interviewing. We focused on the chance of CPR education in 2 years, and observed the difference according to gender, age, and socioeconomic status, especially. Results: The survey was conducted to 228,452 people. 186,857 of them answered the question whether they had the chance of CPR education. There were the differences of the CPR education experience according to gender, education level, types of occupation and family income. Conclusions: It is clear the Bystander CPR rate in Korea increased during last 10 years. However, there is question whether the benefit of CPR education was provided equally.

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Audit on Knowledge Competency among Healthcare Providers Post Chemical, Biological, Radiological, Nuclear and Explosion (CBRNE) Course in Sabah, Malaysia
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Background and Objectives: CBRNE related disaster is increasing in trend worldwide. However, there is still lack of awareness and knowledge among the health care providers especially in Malaysia. Therefore, this audit is to assess for the improvement of the knowledge among health care providers post CBRNE course and determine the percentage. Methods: Pre and post questionnaire were distributed among the 190 participants who attended the course. Convenient sampling method was used. 74 questionnaires pre course and 80 questionnaires post course were used for data analysis. The questionnaires consisted of 53 demographic data (age, gender, occupation, healthcare related position and history of previous attendance to CBRNE course) and 100 questions based on the CBRNE course teaching syllabus. Results: In general, the knowledge improvement seen post course was 10.0%. Nurses and medical assistant group shown most improvement compared to pre course assessment (14.4% and 20.0% respectively). This was followed by the specialist and medical officers group (9.2%) and house officers group (6.2%). There percentage of the participants who scored 50% and above was 73% pre course and 87.5% post course. Reduction of the percentage seen in the group of less than 50% of marks is also seen 27% to 12.5% respectively. Conclusions: There was overall improvement seen post course on CBRNE compared to pre course. The impact of knowledge on the course was seen more on the nurses and medical assistance group. Future courses should be conducted frequently to ensure the knowledge competency among the health care providers are well maintained.

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Postgraduate Emergency Medicine Training For Botswana—a Successful Innovative Hybrid Partnership with South Africa
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Background and Objectives: Emergency Medicine (EM) development has been established worldwide and is continuing to develop all over Sub-Saharan Africa. Medical specialty development requires multiple human resources and logistics which are frequently not available in low and middle income countries (LMICs). Methods: This presentation will describe an innovative hybrid EM specialisation program involving Botswana and South Africa (RSA)- two neighbouring countries in Sub Saharan Africa. Extensive collaborations with government and regulatory bodies in both countries were required to facilitate the program. Results: Despite some initial challenges both countries maintained this partnership since 2010 and the first three EM specialists for Botswana graduated in 2018. The partnership resulted in significant academic and research benefits to both countries and hopes to inspire further country collaborations. There are now 5 successful Botswana- RSA medical specialist training partnerships, with 35 graduates in the last 9 years working as medical specialists in Botswana in Public health, Family medicine, Internal Medicine, Paediatrics and Emergency Medicine. More specialisation programmes are planned and will benefit from the ongoing academic and research collaboration. Conclusions: UB-UCT EM training Partnership Model is a novel and sustainable cross-African collaboration which has significant benefits for both health systems and individual registrars. It is possible to have a successful and high-quality EM specialisation program without all the resources in place, by being innovative and leveraging on external partnerships and collaborations.

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Undergraduate Trauma E-Learning and Simulation Activities
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**Background and Objectives**: E-learning and the flipped classroom approach is a growing trend in medical education. It enhances learning opportunities, boosts teaching efficiency and allows other forms of teaching to take place during contact time. Knowledge acquisition may occur outside of lecture hall and hospital ward, and contact time will be left for analytical exercises, clinical skills practice and simulation practice to aid understanding. **Methods**: The e-learning material and simulation activities were designed for final year undergraduate medical students. We have produced five interactive component-based narrated slides with specific learning objectives for each topic. During training students were guided through a scenario with of a patient who was involved in a road traffic accident from the scene of a road traffic incident. This simulation scenario lasts approximately 30 minutes with contact with a clinical teacher. We sought feedback from participants after they have completed the activities through an online questionnaire to evaluate time spent, understanding of the material and student overall satisfaction. **Results**: 45 students completed the questionnaire. Students reported spending 10-20 minutes on each e-learning topic. 43/45 (97.6%) students agreed that they have gained a basic understanding of trauma management in the Emergency department after completing the modules. Over 90% of students found the modules “great” or “excellent” (37/41), the e-learning material useful (40/45) and the teaching activities useful (38/41). The modules were well received and students found the modules “interesting and interactive”. Negative comments from students were taken into consideration when updating the course. **Conclusions**: Undergraduate emergency medicine trauma teaching may be covered using the flipped classroom approach and simulation training. It appears to enhance both teaching and learning efficiency, facilitates self-learning, whilst keeping the topic interesting for students. This paradigm shift of learning should be supported. **Corresponding Author**: Colin Graham (cagraham@cuhk.edu.hk)

**RUSH Protocol Training in Final Year Medical Students**

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**Background and Objectives**: Rapid ultrasound in shock and hypotension (RUSH) protocol training for medical students is not common. We aimed to evaluate the outcome of our RUSH training for final year medical students so as to give recommendations about modification of teaching methods. **Methods**: Seventy-nine final year medical students at the College of Medicine, UAE University, had four weeks of rotation in emergency medicine during 2017-2018. Their performance during the RUSH training was prospectively studied. Students had 20 multiple choice questions testing theoretical and practical knowledge on the RUSH protocol as a pretest. This was followed by 1-hour didactic session and 2-hour practical session during two consecutive days. A posttest including the same 20 MCQs was repeated following the practical session. A final MCQ including five questions on RUSH protocol was given at the end of the clerkship. **Results**: The post-test score was significantly higher compared with the pretest score (median: 16/20 compared with 6/20, p < 0.0001, Wilcoxon Signed Rank Test). Post-test significantly correlated with the final MCQ mark (r = 0.001, Spearman’s rank correlation). 46.8% of the students passed the cut-off mark of RUSH protocol in the final MCQ. **Conclusions**: 3 hours RUSH training provides significant knowledge increase. Despite that, this knowledge was not retained after three weeks as less than 50% of the students passed the cut-off mark of RUSH. There is a need to increase didactic and practical sessions for RUSH training to achieve acceptable performance. **Corresponding Author**: Arif Alper Cevik (aacevik@uaeu.ac.ae)

**Three Hours EFAST Training For Medical Students, Is It Enough?**

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**Background and Objectives**: There is limited information in the literature regarding EFAST training for medical students. This study aims to evaluate the effectiveness of 3 hours training session for final year medical students. **Methods**: The final year medical students who rotated for four weeks in the emergency medicine clerkship during the 2017-2018 academic year were prospectively studied. Students received a 20 MCQs pretest, 1-hour didactic session and 2-hour practical session at the 8th day of the clerkship. A 20 MCQs post-test was applied after the practical session. Students were assessed using MCQ and OSCE on the 26th day of the clerkship. **Results**: 79 students enrolled in the study. There was a significant improvement in the post-test scores compared with the pretest score (median: 15/20 compared with 7/20, p < 0.0001, Wilcoxon Signed Rank Test). There was a significant correlation between the post-test and final MCQ marks (p < 0.0001, Spearman’s rank correlation). 78.5% and 64.6% of the students were able to pass the cut-off passing mark in final MCQ and OSCE, respectively. **Conclusions**: 3 hours training session provides significant improvement in EFAST knowledge in post-test and final MCQ. To improve OSCE performance, students should be engaged more in the clinical setting and be more exposed to practical sessions. **Corresponding Author**: Arif Alper Cevik (aacevik@uaeu.ac.ae)

**Impeded Panorama: A Case of Angioedema**

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**Background and Objectives**: Angioedema is self-limiting, localized subcutaneous swelling, which results from extravasation of fluid into intestinal tissues. The incidence of hereditary angioedema is between 1 in 10,000 to 1 in 50,000. We discussing about a patient who was brought in unconscious which turns out to be a unanticipated difficult airway and the challenges in securing airway. Later we knew that patient has previously been diagnosed as hereditary angioedema and defaulted follow up. **Methods**: A 30 years man brought in unconscious by passer-by. On arrival, patient had stridor which did not improve despite the airway was opened. Thus the decision for emergency intubation was made. After medications for rapid sequence intubation administered including muscle paralytic agent, we were unable to visualise his vocal cord due to his extensive laryngeal edema. After few attempts of conventional method using laryngoscope failed, we managed to secure his airway using the assistance of video laryngoscope with smaller tube. He was pushed to emergency theatre for tracheostomy and direct laryngoscope. Scope findings were generalised oedema over mouth, pharyngeal wall, epiglottis and false cords. He was started on steroid therapy immediately. Repeated scope 3 days later showed resolving edema. He was discharged home well. **Results**: He-deditary angioedema patient become an emergency clinician’s nightmare in emergency department when they come in upper airway obstruction, especially when medical history is unknown. Difficult intubation should always be anticipated in patients presenting with upper airway obstruction sign. Preferably intubation should be carried out in intensive care unit. However if immediately unavailable, awake intubation method is an alternative with the standby of surgical airway equipment. Prompt decision to secure airway is vital to prevent mortality and morbidity. **Conclusions**: Stridor is a sign of airway obstruction which may compli-cate into difficult airway. Aside video laryngoscope, awake intubation is an alter-native in difficult airway patient. **Corresponding Author**: Dr Siti Nasrina Yahaya Dr Siti Nasrina Yahaya (radonsny@yahoo.com)

**Change in Jaw Oclusive Power by Inducing Paralysis of the Masseter Muscle with Injection of a Neuromuscular Blocking Agent: Sion’s Masseter Muscle Paralysis**

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**Background and Objectives**: We aimed to determine whether jaw oclusive power decreases with the injection of neuromuscular blocking agents in masseter muscle-a method we named Sion’s Masseter muscle Paralysis (SMP). **Methods**: A randomised, placebo-controlled animal study was conducted in which researchers were blinded to group allocation. We used 12 male mongrel dogs aged 10–12 months and weighing 30–35 kg. Four groups were formed: a conventional dose (CD) group (0.004 mg/kg succinylcholine in 4 mL normal saline [NS]); a high dose (HD) group (0.04 mg/kg succinylcholine in 4 mL NS); a placebo group (4 mL NS); and no intervention group. To measure the jaw oclusive power, 1-kg weights were hung sequentially on a specifically designed device on the animal’s lower jaw. At –4, –2, 0, +2, +4, +6, +8, +10, +20, and +30 min, we measured the jaw oclusive power, oxygen saturation (SpO2) and end tidal carbon dioxide (ET CO2). **Results**: After SMP, jaw oclusive power began to decline in CD and HD...
Rapid Sequence Intubation by Final-Year Medical Students Improves Success Rate of First-Attempt Intubation in Emergency Department without Increased Complication in Thailand

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Background and Objectives: Emergency Medicine is an emerging specialty in Thailand. Rapid sequence intubation (RSI) is an unfamiliar technique and not the standard of care for intubation in Thai Emergency Departments (ED). For medical students, intubation is one of the most difficult ED procedures. We sought to find whether RSI would be a more effective technique for inexperienced intubators than standard intubation in Thai EDs, i.e., awake intubation or sedation without paralysis.

Methods: This was a prospective observational study performed at a single tertiary care, teaching hospital between November 2017-October 2018. Selected cases comprise only patients intubated by final-year medical students. We collected data on demographics, medication, complication events and intubation technique. Results: Of 68 intubated patients in the ED, median age was 69 years (53-85), 45 (66%) were male, 24 (35%) had pneumonia which was the most common diagnosis and 29 (43%) had at least one predictor of difficult airway. 55 (81%) underwet RSI and 13 (19%) underwent standard intubation. The RSI group had a higher success rate on first-attempt intubation compared to the standard group, 61.8% vs. 30.8% (p=0.04). Complication rates among both groups did not significantly differ, 5.5% vs. 15.4% (p=0.24). The RSI group had better glottic view (grade I and II according to Cormack and Lehane classification) than the standard group, 85.2% vs. 53.8% (p=0.02). Anterior cord was the most common reason for multiple-attempt intubation in both groups, 43.8% vs. 83.3% (p=0.20).

Conclusions: Using RSI improved the success rate of first-attempt intubation by final-year medical students without increased complication rate. RSI technique should be supported as the standard of care for intubation in Thai EDs, in conjunction with advanced emergency airway management training. Additional data with nationwide study should be collected in further studies.

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A Pilot Study of Preoxygenation and Apneic Oxygenation with High-flow Nasal Cannula During RSI in Emergency Department: a Randomized Controlled Clinical Trial

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Background and Objectives: Desaturation is one of the most common complications during rapid sequence intubation (RSI). High flow nasal cannula has been widely studied especially in intensive care unit setting in order to prevent desaturation during intubation. However, the effectiveness of the treatment remains inconclusive. This is the first randomized controlled study focusing on high flow nasal cannula in patients with hypoxic respiratory failure emergency department setting. The primary outcome of this study was the incidence of desaturation during intubation. Secondary outcomes were the lowest oxygen level and decrease in oxygen saturation.

Methods: This single-centered randomized controlled trial was conducted at emergency department of King Chulalongkorn Memorial Hospital. Acute hypoxic respiratory failure adults requiring intubation were randomly allocated to 1) standard care by RSI without apneic oxygenation, 2) preoxygenation by non-rebreathing mask with bag or bag valve mask and apneic oxygenation with nasal cannula 15LPM, and 3) preoxygenation and apneic oxygenation with 60LPM high flow nasal cannula. Oxygenation in each patient was monitored by pulse oximetry during RSI. Results: A total of 27 patients were enrolled in this pilot study. There was no incidence of desaturation in high flow nasal cannula group. Incidence of desaturation were demonstrated in standard care group and nasal cannula 15LPM group (22.2% and 28.6% respectively). However, there was no statistically significant in the proportion of desaturation patients among all study groups (28.6% standard care vs. 22.2% nasal cannula 15 LPM, p=0.771; 0% high flow nasal cannula vs. 22.2% nasal cannula 15 LPM, p=0.099; 0% high flow nasal cannula vs. 28.6% nasal cannula, p=0.06). Conclusions: This study demonstrated that using high flow nasal cannula for preoxygenation and apneic oxygenation during RSI may decrease the incidence of desaturation without complication.

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A Tailor-made Figure-of-eight Innovative Pattern to Reduce the Number of Cuts to a Cotton Wool Roll and the Waste For Clavicular Fracture Gasts

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Background and Objectives: Generally, clavicular fractures are treated by using a figure-of-eight of cotton wool. During the process, a cotton wool roll is cut approximately 3-5 times which is wasteful and can cause pain to patients. Objective: To minimize the number of cuts to a cotton wool roll and waste during the figure-of-eight procedure. Methods: This interrupted time study was conducted by using 233 healthy volunteers at least 20 years old and with a variety of body mass indices. They were divided into a conventional group and an innovative group consisting of 110 and 113 volunteers respectively. In the conventional group the length of cotton roll to be used was estimated for each body shape. This data was divided by chest measurement into S, M, L and XL subgroups for males and females. The mean and standard deviation for each subgroup were calculated. Then, we applied the cotton wool roll length computed by mean±2SD to give a tailor-made figure-of-eight pattern for the innovative group. Multi-level linear regression analysis was applied to compare the number of cotton roll cuts and the waste of these two groups. Results: The innovative group had fewer cotton roll cuts (0.8±0.5 times vs. 2.4±1.1 times, p<0.001) and less waste than the conventional group (8.8±7.3 cm vs. 23.0±12.9 cm, p<0.001).

Conclusions: A tailor-made figure-of-eight innovative pattern can help reduce the number of cotton roll cuts and waste during the figure-of-eight procedure.

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Assessment of a Novel Method to Confirming Nasogastric Tube Placement in a Porcine Model

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Background and Objectives: Insertion of a nasogastric (NG) tube via nasal or oral passage is a common procedure that provides gastric lavage, feeding or medical administration. Misplacement of NG tubes to the trachea can lead to life-threatening condition. We developed a novel method to confirming NG tube placement by using electro-magnet sensor system. Methods: Ten swine were anesthetized. An NG tube with a sensor microchip at the tip of the tube was inserted to the stomach via esophagus, or to the carina via endotracheal tube. We used a detector for electro-magnet circuit to identify the signal the location of the NG tube. Results: 100% (10 of 10) tracheal placement of the NG tube were identified by the electro-magnet sensor system, where 80% (8 of 10) of stomach placement of the NG tube were identified (p<0.005). Conclusions: The electro-magnet sensor system allows accurate identification of the placement of NG tube, which can be a useful tool for confirming bedside NG tube placement.

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Limited Value of Thoracic Vent For Treating the Pneumothorax in the Emergency Department

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Background and Objectives: There are several modalities for treating the PTX. Conventional intercostal chest tube drainage (CTD) is used most widely. Thoracic Vent (TV) is one of the options. Reduced pain due to minimal incision, ease of
use, decrease of hospitalization and medical costs are the advantages of TV. Some of the patients who treated with the TV initially are converted to the CTD for several reasons in clinical practice. The aim of this study was to assess the therapeutic efficacy of TV use compared to the conventional CTD in ED.

Methods: This was a prospective study in Korea. The patients with spontaneous PTX (15-50 years) were eligible. We compared the TV group, CTD group and the crossover group (TV to CTD changed). The UreSil TRU-CLOSE Thoracic Vent® was used (Fig. 1). Initial TV was removed and replaced by the CTD if full expansion was not noted at 2nd day of TV. Results: Finally 75 patients were enrolled. 47 patients were treated with the CTD initially while 28 patients were treated with TV initially. In 28 TV patients, the PTX was treated with TV only in 9 patients. Initial TV’s were replaced by the CTD’s in the other 19 (67.9%) patients. Among these 19 patients, 15 achieved the clinical success with initial TV at second day but were changed to the CTD due to operation. TV failure occurred in 4 patients. Initial decreased size of the PTX was larger in the CTD group (42.6% vs. 17.5% vs. 27.9%, p=0.038). Air-leakage duration, total drainage duration, admission duration were longer in the crossover group. Conclusions: Strict indications of the TV as a first treatment modality are needed.

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Risk Stratification of Extravasation with a Semi-automatic Intravenous Device (EZ-IO®) Use in a Pediatric Emergency Setting
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Background and Objectives: Intravenous (IO) access is an useful alternative to intravenous access. Several studies demonstrated that a semi-automatic intravenous device (EZ-IO®) is a safe and convenient device for establishing IO access. Although issues such as extravasations have been recognized as its complications, the risk factor of these complications was unknown. Therefore, we investigated risk factors which are correlated with extravasation caused by EZ-IO® use.

Methods: A retrospective observational study was conducted at Tokyo Metropolitan Children’s Medical Center which has an annual intake of 38,000 patients and is located in suburban Tokyo, Japan. Patients younger than 15 years old who underwent an IO insertion using EZ-IO® in our pediatric emergency department between January 1, 2013 and August 31, 2017 were included. Data on age, gender, body weight, Glasgow Coma Scale (GCS), diagnosis, operator of EZ-IO®, performing fluid bolus, and extravasation were collected. We conducted bivariate and multivariate analysis for identifying a risk of extravasation caused by EZ-IO® use.

Results: Seventy-two patients were enrolled (Median age, 9 months: Inter-quartile Range (IQR) 3-32 months); of these 38 (53%) were male, and 14 (19%) patients had extravasation. Bivariate analysis showed that GCS score of 9-15 was statistically associated with extravasations [Odds Ratio (OR) 4.78, 95% confidence interval (CI) 1.34-17.02, p=0.03]. Multivariable analysis demonstrated a similar result with OR of 5.00 (95% CI 1.08-23.16, p=0.04). Conclusions: Higher GCS score (9-15) was significantly more associated with extravasation with EZ-IO® use than lower GCS (<9). Careful attention should be paid for the patients with higher GCS when establishing IO by using EZ-IO®.

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No More Fecal Disimpaction—Novel Use of the Ischiorectal Fossa Block
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Background and Objectives: Of all procedural tasks required by a nurse or a medical officer, non causes as much consternation and dread as the request to perform a manual disimpaction of faeces. This most unpleasant task is not only undignified for the patient but is a painful procedure requiring analgesia and/or sedation and is certainly not risk free. Faecal impaction is usually included as a complication of constipation as they do occur in these patients. However, an alternate pathophysiology to this distressing condition is the formation of acute fissures which causes pain and bleeding further exacerbating the constipation. Therefore, the primary pathophysiology of faecal impaction is acute fissure with tenesmus and obstruction. This is often seen in geriatric patients presenting with overflow diarrhoea.

Methods: This is a case study presentation of two patients who were successfully treated for faecal impaction by the use of modified pudendal nerve block and 2 litres of a polyethylene glycol product. A description of the pudendal nerve and its route through the ischiorectal fossa will be described from which the concept of the modified ischiorectal fossa block has been derived. Access is from epithelialised skin medial to the ischial tuberosity posterolaterally, 6-8 cm from the anus at the 2 and 10 o’clock position in the right and left compartment.

Results: Elimination of anal spasm allows passage of desiccated faeces with the aid of two litres of orally ingested PEG solution. This method relies on accessing the ischiorectal space which is a larger target and easier to reach. Both patients were able to successfully achieve “clean out” while admitted to the short stay unit. Neither required admission nor any analgesia or sedation.

Conclusions: This approach of a modified pudendal nerve block and oral bowel cleansing fluid hopefully can sign manual disimpacitonto medical history books.

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Improving the Quality of Dressing Changes For Difficult Wounds with the Bi-directional Irrigation System
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Background and Objectives: Negative pressure wound therapy (NPWT) can provide a moist environment for the wounds and reduce biofilm and edema fluid. Wound irrigation is another technique for wound treatment during debridement or postoperative care. This technique can reduce the load of biofilm to increase possibility of wound healing. This study aimed to introduce a new economic device for the management of difficult wounds by employing one of two techniques (negative pressure wound therapy and wound irrigation), which we called the Bi-directional irrigation system.

Methods: A retrospective chart review 2017-2018 was conducted in seven patients with eight infectious diseases. Three infection diseases were treated with the type A Bi-directional irrigation system, while five infection diseases were treated with the type B Bi-directional irrigation system. We performed the irrigation techniques with normal saline at 500 mL-2000 mL per day to treat the wounds and set a negative pressure of 125 mmHg (for type B).

Results: The outcome measure was a decrease in inflammatory profiles in five infectious diseases with an average of 70% reduction. All eight infectious diseases were managed with the Bi-directional irrigation system during hospitalization. One patient was lost to follow-up. The other patient’s wounds were either healed during hospitalization within 2-15 weeks of follow-up. Conclusions: There were no obvious complications associated with the new device. Despite the fact that a larger study is required to prove the efficacy of the Bi-directional irrigation system, we recommend using this system to manage infections in difficult wounds.

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The Epidemiology of Power-mobility Devices Related Injury
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Background and Objectives: The number of power-mobility devices (PMD), including powered wheelchairs and scooters, users is increasing every year in Republic of Korea. This study aimed to describe and analyze features of the PMD-related injuries and compare the features in elderly individuals with those in younger adults. Methods: Data from the Emergency Department-based Injury In-depth Surveillance (EDISS) databases of Republic of Korea during 2011 to 2016 from eight emergency departments were analyzed. The subject was limited to injuries that occurred during the use of PMD, indoor cases and cases aged 18 or younger were excluded. The variables included demographic characteristics, injury mechanisms, and hospital outcomes. Each variable was analyzed and compared to the elderly and young people by age 65. Results: 231 adults were enrolled, 150 of whom were aged >65 years. The number of total PMD-related injuries increased every year and proportion of elderly patient also increased. Most of injuries happened on the roadway and were caused without crash opponents. The patients with aged >65 group showed higher incidence of admission and operation (p=0.008), and they also had a higher injury severity score based on EMR-ISS (p=0.015). Conclusions: The number of PMD-related injury is increasing every year. There was a high rate of injuries on the roadway, and many of...
juries happened without crash opponents. The severity score and the incidence of admission and surgical operation on those injuries are higher for elderly individuals.

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**Gender Disparities in Epidemiological Features and Clinical Outcomes of Bicyclists Injuries**

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**Background and Objectives:** Bicycling is an increasingly popular recreation and mode of transportation in Korea. Improved understanding of gender-specific differences in epidemiological features and clinical outcomes in bicycling injuries could help to understand bicycle-related injuries and develop preventive strategies. This study aimed to investigate gender-specific differences in epidemiological features and clinical outcomes in bicycling injuries. **Methods:** This is a cross-sectional study based on the Emergency Department (ED)-based Injury In-depth Surveillance (EDISS) database from 23 EDs in Korea. All of injured bicyclists between January 1, 2011. and December 31, 2016. were eligible, excluding passengers and cases with unknown outcomes. The primary outcome was in-hospital mortality and the secondary outcomes were clinical important injury (ICU admission or in-hospital death) and intracranial injury. We calculated adjusted odds ratios (ORs) of gender (male) for study outcomes after adjusting for potential confounders and calculated ORs of gender (male) in age groups by age-stratified analysis of study outcomes. **Results:** Among 35,605 eligible patients, 28,057 (78.8%) patients were male and 7,550 (21.2%) were female. Bicycling injuries of male occurred more in pediatrics and geriatrics, at nighttime, on road and in motor vehicle collisions (all \(p < 0.05\)). The rate of helmets use and alcohol intake were higher in male group (\(p < 0.05\)). The male group was more likely to have in-hospital mortality (OR: 1.63 [1.13-2.32]), clinical important injury (OR: 1.44 [1.21-1.72]) and intracranial injury (OR: 1.28 [1.09-1.49]). In age stratified analysis, the geriatric male had more in-hospital mortality (OR: 1.73 [1.03-2.93]), clinical important injury (OR: 1.40 [1.02-1.93]) and intracranial injury (OR: 1.77 [1.30-2.42]). **Conclusions:** There were gender-specific differences in epidemiological features and clinical outcomes in bicycling injuries. Bicycling injuries of male (esp, in geriatric male) had more severe outcomes than female. Preventative strategies to reduce the bicycling injuries targeting male (esp, geriatric male) are needed.

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**PO_INJ_02_03**

**The Preventive Effects of Bicycle Helmets on Clinical Outcomes in Bicycle-Related Crashes**

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**Background and Objectives:** Bicycling is an increasingly popular recreation and mode of transportation in Korea. Head injury is the leading cause of death and permanent disability in bicycle-related crashes. So, the bicycle helmet is crucial protective equipment for bicyclists. This study aimed to measure the protective effects of bicycle helmet use on clinical outcomes in bicycle-related crashes. **Methods:** This is a cross-sectional study based on the Emergency Department (ED)-based Injury In-depth Surveillance (EDISS) database from 23 EDs in Korea. All of injured bicyclists between January 1, 2011. and December 31, 2016. were eligible, excluding cases with unknown helmet use and outcomes. The primary outcome was intracranial injury and the secondary outcomes were in-hospital mortality and clinical important injury (admission or in-hospital death). We calculated adjusted odds ratios (ORs) of helmet use for study outcomes after adjusting for potential confounders. and in age groups by age-stratified analysis of study outcomes. **Results:** Among 24,306 eligible patients, 2,547 (10.5%) patients were wearing helmets at the time of injury. 910 (3.7%) patients had intracranial injuries, 196 (0.8%) patients had in-hospital death and 3,745 (15.4%) had clinical important injury. The un-helmeted group was more likely to have severe injuries in Head & Face (43.5% vs. 35.2, \(p < 0.05\)) but less in Neck (1.0% vs. 1.8%, \(p < 0.05\)). The helmeted group was less likely to have intracranial injury (OR: 0.42 [0.30-0.57], in-hospital mortality (OR: 0.43 [0.22-0.84] and clinical important injury (OR: 0.79 [0.70-0.89]. In age stratified analysis, the helmet use reduced significantly intracranial injury, in-hospital mortality and clinical important injury in geriatrics but not in pediatrics. **Conclusions:** Wearing helmets in bicycle-related crashes had a significant preventive effects to reduce intracranial injury, in-hospital mortality and clinical important injury. But the rate of wearing helmet was very low. Public health efforts to increase bicycle helmet use are needed to reduce health burden from injuries caused by bicycle crashes.

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Posterior Reversible Encephalopathy Syndrome—An Uncommon Cause of Status Epilepticus

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Background and Objectives: Posterior Reversible Encephalopathy Syndrome (PRES) is a clinical radiographic syndrome characterized by headache, visual symptoms, seizures and altered consciousness. We report a case of PRES manifesting as status epilepticus secondary to severe hypertension from underlying chronic IgA nephropathy. Methods: A 24-year-old previously well Indian male presented to our Emergency Department in status epilepticus. He was intubated for airway protection due to depressed consciousness. CT brain showed a diffuse, swollen cerebellum with early hydrocephalus, requiring external ventricular drain (EVD) insertion. He continued to have recurrent seizures despite being on multiple anti-epileptic drugs and a propofol infusion. Infectious disease and autoimmune screen were negative. Investigations revealed acute renal failure complicated by metabolic acidosis and hyperkalemia. MRI brain showed extensive white matter T2-hyperdensities over the cerebellum and right occipital lobe. Reversibility of symptoms and imaging findings with aggressive blood pressure lowering therapy and initiation of dialysis led to a diagnosis of PRES. Results: PRES can occur any patient age group and typically affects the parietal and occipital lobes. It is associated with conditions including hypertensive emergency, renal disease, pre-eclampsia and use of immunosuppressive drugs. Underlying pathogenesis is related to disordered cerebral autoregulation and endothelial dysfunction. Conclusions: Prompt recognition and treatment is important in preventing permanent neurological sequelae that can occur in this otherwise typically reversible condition.

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Incidence of Acute Cerebral Infarction or Space Occupying Lesion and the Role of Cerebellar Function Test and D-dimer among Patients with Isolated Dizziness

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Background and Objectives: To evaluate the incidence of acute cerebral infarction (ACI) or space occupying lesion (SOL), and the role of cerebellar function test (CFT) and d-dimer among patients with isolated dizziness. Methods: We conducted a retrospective study of emergency department (ED) patients with a chief complaint of dizziness or vertigo. Isolated dizziness defines as the dizziness without any altered mentality, confusion, diplopia, dysarthria, facial palsy, motor or sensory deficit and without any other mechanisms such as infection, recent trauma, anaphylaxis, drug, and so on. We excluded patients with underlying malignancy, aneurysm, transferred during recent infarction treatment and patients who did not check brain magnetic resonance image (MRI) within 48 hr. ACI was based on the MRI diffusion weighted image (DWI). Results: A total of 468 patients were enrolled. Thirty patients (2.8%) had ACI, 11 at cerebellum, 1 at occipital lobe and 1 at centrum semiovale. Twenty-five patients (5.3%) had SOL. Aneurysm is most common (n = 7), followed by meningioma (n = 4) and venous anomaly (n = 4). In total, ACI or SOL were found in 8.1% (n = 38). Abnormal finding at finger to nose, heel to shin, and rapid alternative movement test were significantly higher in AIS or total group, while gait disturbance, tandem gait abnormality, and Romberg test were not. Sensitivities of CFTs were low for ACI as well as for ACI or SOL. D-dimer level showed sensitivity of 100% at > 0.18 mg/L for ACI and > 0.15 mg/L for ACI or SOL. Among subgroup (n = 411) who did not showed any abnormality on CFT, 9 patients (2.2%) had ACI and 33 patients (8.0%) had ACI or SOL. Conclusions: The present study reports a clinically significant incidence of ACI or SOL among ED patients with isolated dizziness. D-dimer was a most sensitive test, while CFT showed low sensitivity.

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JE: When Farming Goes Wrong

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Background and Objectives: Japanese encephalitis (JE) is a zoonotic disease caused by Japanese Encephalitis Virus (JEV) of Flavivirus genus. It is primarily transmitted by evening biting Culex mosquitoes which feed on JEV reservoirs such as pigs and water birds. The case fatality can be as high as 30% and up to 50% who survived had permanent neurologic or psychiatric sequelae. Methods: A 47 years old lady with underlying hypertension presented to our Emergency Department on the 20th January 2019 complaining of fever for two days associated with headache, neck stiffness, generalized body weakness and photophobia. On examination, her vital signs were stable. She was conscious, obeying command but disoriented to time, place and person. Her neck was in hyper-extend position and neurological examination showed reduced power of all limbs with normal reflexes and tone. She was treated for viral meningoencephalitis. Lumbar puncture results showed viral picture and serum JE IgM was positive. Her contrast CT brain showed hypodensities at thalamus and mid brain. Further history noted she was a farmer, own a paddy fields, pigs farm and palm oil plantation. In the ward, she developed status epilepticus and was intubated. Her condition was complicated with ventilator acquired pneumonia leading to death. Results: JE occurs in Asia and susceptible to children less than 15 years old, but individuals of any age can be affected. The annual incidence varies from <1% to >10% per 100,000 population but can be higher during outbreak. In Miri, Sarawak there were 6 cases reported from Year 2014 to 2018. The Vector-Bourne Control Unit found that areas at high risk of JE transmission were at the paddy fields and oil palm plantation near the irrigation system. The presence of pigs and migrating birds as reservoir and amplifying hosts pose risks which can cause outbreak. Less than 1% of JE infected people develop clinical illness. The symptoms can be similar to other causes of encephalitis, but proper history and presence of risk factors can aid in the diagnosis. JE is a preventable disease. Prevention of mosquitoes bite and breeding are important. JE immunization is recommended in all regions where the disease is recognized by public health, along with strengthening surveillance and reporting mechanism. Conclusions: Presentation of JE can mimic other causes of meningoencephalitis. One should have high index of suspicion for JE for a patient who come from an endemic area in Sarawak. The history of vaccination, previous outbreak and presence of reservoirs and vector are important in diagnosing JE.

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Pain Severity Scores and Appropriate Choice of Analgesia Improves Time to Discharge/Referral in Lower Back Pain

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Background and Objectives: Low back pain is the most common musculoskeletal pain complaint that presents to the emergency department, and it affects most adults at some point in their lives. A longstanding problem in emergency departments worldwide is inadequate pain management (oligoanalgesia) due to delay in diagnosis and inadequate prescribing of analgesia. Studies have shown that administration of analgesia within 90 minutes, can reduce ED length of stay by two hours. It is therefore important for Emergency physicians to develop skills and strategies to recognise and treat pain appropriately and promptly. The Royal College of Emergency Medicine national guidelines, lays out a structured method of assessing and managing acute pain in the emergency department. This is the standard we seek to follow. Methods: A retrospective audit of 15 adult patients who presented with low back pain to our ED in January 2017. We assessed documentation of pain severity scores, choice of analgesia, time to analgesia, re-evaluation of pain severity post analgesia and time to discharge. Inclusion Criteria: Patients above 16 yr, with diagnosis of simple/musculoskeletal back pain. Exclusion Criteria: Patients with cauda equina, red flags of serious spinal pathology, Abdominal aortic aneurysm. Patients under 16 yr. Results: We noticed a poor documentation of pain scores and arbitrary administration of analgesia. We then introduced a protocol for analgesia in low back pain and referral guidelines. We observed an improvement in our documentation, administration of analgesia commensurate with patient’s pain severity and better flow through the department. Conclusions: Early adequate analgesia given in triage, based on pain severity scores, is necessary to ensure quick flow of patients presenting with lower back pain to the emergency department.

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Anti-NMDA Receptor Encephalitis: Unknown Encephalitis (Case Report and Literature Review)
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Background and Objectives: Auto-immune mediated anti-NMDA receptor encephalitis is a very common delayed diagnosed encephalitis which predominantly affecting young population (1). This encephalitis is relatively unknown amongst emergency physicians and a majority of patients are admitted to psychiatric wards before their diagnosis is confirmed and appropriate treatments are commenced.

Methods: We reported a case of a 22-year-old female presented to our emergency department with acute psychiatric symptoms. She was initially diagnosed with first presentation of acute psychosis and was hospitalised under mental health act. Further assessment in the emergency department identified possible an organic cause for her acute psychosis and she was later admitted under medical team after her mental health assessment order was revoked. Several days later, her CSF result was positive with anti-NMDA receptor anti-bodies. Appropriate treatments were instituted leading to her full recovery.

Results: This was the first confirmed anti-NMDDA receptor encephalitis in our emergency department. It highlights the importance of thorough assessment of psychiatric presentations to emergency departments and consideration of auto-immune mediated encephalitis as one of the differential diagnosis in young patients presenting with first acute psychotic episode.

Conclusions: This case was the first confirmed anti-NMDA receptor encephalitis in our emergency department. It highlights the importance of thorough assessment of psychiatric presentations to emergency departments and consideration of auto-immune mediated encephalitides as one of the differential diagnosis in young patients presenting with first acute psychotic episode.

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Admission Hyperglycemia and Outcomes of Patients with Acute Myocardial Infarction with ST-Segment Elevation (STEMI)
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Background and Objectives: Elevated blood glucose levels on admission are associated with poor outcomes in patients with STEMI. The aim of this study was to evaluate the association between admission hyperglycemia, length of stay and in-hospital mortality in patients with STEMI.

Methods: We analyzed 72 patients admitted to Emergency Department, Hospital Labuan for STEMI and were thrombolysed; from 1st January 2016–31st October 2018. Patients were divided into 2 groups based on admission blood glucose levels of <10 and ≥10 mmol/L. The outcomes analyzed were total length of stay and in-hospital mortality. Continuous data was presented as the mean value and standard deviation. Discrete data was presented in absolute value and percentage. Differences between the two groups for continuous quantitative variables were performed by Chi-Square test.

Results: There was no significant association in between admission hyperglycemia and total length of stay or in-hospital mortality. Group with admission blood glucose <10 mmol/L (n=56) and admission blood glucose ≥10 mmol/L (n=16) had mean length of stay 6.02 days and 7.6 days respectively (p value 0.146). The numbers for in-hospital mortality were 4 patients for group with admission blood glucose <10 mmol/L whereas 1 patient for group with admission glucose ≥10 mmol/L (p value 0.901).

Conclusions: From our study, hyperglycemia on admission is not a predictor of in-hospital mortality in patients with STEMI and could not be used in the stratification of risk in these patients.

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Waiting Time in Accident and Emergency Department (A&E) Time Motion Study 2018 at King Faisal Hospital, Kigali Rwanda
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Background and Objectives: King Faisal Hospital Kigali Accident and Emergency policy state that A&E staff should review and manage patients appropriately within 2 hours of presentation. Additionally, data collected last four years in 2014 indicate that the average waiting time at Accident and Emergency services were 7 hours which was longer than hospital standard. However, anecdotal evidence suggests that: • Patients are waiting too long to be discharged/admitted from A&E • There is a backlog of patients waiting for blood tests in A&E • There is an increased number of A&E patient complaints to Customer Care due to the long wait time. In line with KFH’s mission, accreditation standards, and policies, this project aims to increase patients’ satisfaction in ED by reducing waiting time from 6 hours to three hours before the patients are being discharged, transferred or admitted.

Methods: To better understand how patients spend their time in the A&E, a time-motion study was designed and implemented and two staff were recruited in order to reduce waiting time. A data collection tool was reviewed and validated by Accident and Emergency tea in Collaboration with Quality Office. The data were collected retrospectively for 2 months (February and March 2018) with a total number of sixty-eight patients. These data included proportionately patients who presented during nights, weekends, clinics and admissions or discharges.

Results: The average waiting time was 7 hours and 38 minutes.

Conclusions: The average waiting time in 2018 in A&E was higher than in 2014. Therefore, we will focus on the following possible root causes as follows: Staff shortage, lack of pharmacy in Accident and Emergency Post graduate’s doctors who delay coming to review the patients, Radiology, Laboratory, lack of beds in the wards and the long queue at cashier’s desk.

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BNP and NT-pro BNP as a Promising Biomarker Related Sudden Cardiac Death: A Systematic Review and Dose Response Meta-analysis
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Background and Objectives: There have been a few studies of BNP to predict sudden cardiac deaths. However, it is difficult to generalize the results because these studies are limited to patients with cardiac problems. The aim of this research was to determine whether BNP or NT-pro BNP are meaningful as a biomarker to predict sudden cardiac death using systematic review and dose-response meta-analysis.

Methods: We searched PubMed, Embase and Cochrane library from May 1997 to March 2018 for all studies of BNP (NT-pro BNP) in patients associated SCD. Four emergency specialists were judged whether they were suitable for reporting and analyzing the full text of searched papers. We determined the overall hazard ratio (HR) and 95% of confidence interval (CI) for the level of BNP associated SCD. A dose-response meta-analysis was performed to assess the risk of SCDs based on the level of BNP.

Results: We identified 17 articles that assessed whether BNP were meaningful as a biomarker to predict sudden cardiac death. For studies expressed level of BNP (NT-pro BNP) as continuous variables, the HR of sudden cardiac death increases 1.21-fold (1.02-fold) when BNP (NT-pro BNP) is increased by 1 pg/dL. For studies expressed level of BNP (NT-pro BNP) as categorical variables, the HR of sudden cardiac death increases 2.49-fold (1.05-fold) in groups with higher BNP (NT-pro BNP) than in groups with lower BNP (NT-pro BNP). In the dose-response analysis, the HR of SCD who increased NT-pro BNP showed non-linearity of the correlation.

Conclusions: This study suggest that SCD risk tended to increase when BNP or NT-pro BNP increased in general population including regardless of disease. Future research should be needed to confirm our analysis.

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A Systematic Review of the Impact of Intravenous Fluids and Intravenous Thiamine in the Treatment of Alcohol Intoxication in the Emergency Department

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Background and Objectives: Patients presenting to the emergency department (ED) with acute alcohol intoxication are often given intravenous (IV) fluid and/or IV thiamine. However, evidence of benefit for either therapy, in terms of reducing departmental length of stay (LOS), is limited. We assessed current practice at a large inner-city ED and carried out a systematic review to evaluate the impact of IV fluids or IV thiamine in the treatment of alcohol intoxication. Methods: To access current practice, all records of patients with an elevated serum alcohol level during a one-month period were retrospectively analysed to assess whether IV fluid and/or IV thiamine had an impact on departmental LOS. For the systematic review, the MEDLINE, PubMed, EMBASE and CINAHL databases were queried using keywords, generating 201 manuscripts. After review, 8 relevant studies were included and assessed using the Cochrane Date extraction template. Results: The majority of patients presenting with acute alcohol intoxication to our ED are given at least 1 litre of IV crystalloid fluid. A smaller proportion are given IV thiamine. Neither IV fluids or IV thiamine had a statistically significant impact on departmental LOS. Of the 8 manuscripts that met our criteria there were 2 randomised controlled trials, 3 cohort studies, 2 clinical reviews and 1 observational study. All had small sample sizes, but no correlation was found between LOS and the use of IV fluids and/or IV thiamine. Conclusions: IV fluid and/or thiamine use in acute alcohol intoxication is prevalent, however, there is no evidence base to support these therapies. It appears an adequately powered, randomised control trial has yet to be carried out to fully assess these outcomes. In the interim, clinicians should consider that there is no current indication supporting routine use of IV fluids or thiamine in acute alcohol intoxication.

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Evaluation of Hemodynamic Characteristics of the Saint Jude Prosthetic Heart Valve in the Mitral Position

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Background and Objectives: Until recently, there were few data on the hemodynamic characteristics of the Saint Jude prosthetic heart valve in the mitral position in Vietnamese patients. The objective of this study was to define the normal values of hemodynamic parameters of the Saint Jude valve in the mitral position in patients operated at the Heart Institute of Ho Chi Minh City, Vietnam. Methods: Prospective observational study in patients who had mitral valve replacement with the Saint Jude valve at least 6 months before and who were in stable clinical condition. The following hemodynamic parameters were studied: Vmax (maximal velocity of transmural flow), Gmax (maximal trans-mitral gradient), Gmean (mean trans-mitral gradient), PHT (pressure half-time), EOAA (effective orifice area), EOAF (effective orifice area index), VTI (volume time index), PPI (prosthesis performance index). Objective of the study: 1. Describe baseline clinical characteristics. 2. Define structure and hemodynamic parameters of prosthetic mitral valve on Doppler Echocardiography. 3. Compare difference of basic echo parameters in periods (pre-surgery, early post surgery and at the point of observation). Results: 65 patients (mean age 46.6 ± 9.1, male 30.8%) were included in the study. The values were as follow: Vmax 1.78 ± 0.30 m/s; Gmax 13.15 ± 4.18 mmHg; Gmean 4.92 ± 1.72 mmHg; PHT 85.59 ± 16.12 ms; EOAA 1.78 ± 0.43 cm²; EOAF 1.16 ± 0.29 cm²/m²; ti sō VTI 1.85 ± 0.49; PPI 0.47 ± 0.12. Based on the EOAI calculated with the new proposed formula, the incidence of prosthesis-patient mismatch, Vmax, Gmax, Gmean decreased early post surgery; LAD, DAP improved significantly. Conclusions: Our study defined the normal values for hemodynamic parameters of the Saint Jude valve in the mitral position in Vietnamese patients. Calculation of EOAI with the continuity equation is necessary to indentify patients with the prosthesis-patient mismatch.

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Effects of Metronome on Chest Compression Performance in Cardiopulmonary Resuscitation

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Background and Objectives: The performance of high quality chest compression is important to improve survival of patients with cardiac arrest. In the new American Heart Association guidelines 2015 highlights the important of high quality CPR components which include the number of chest compression at least 100 to 120 per minute, adequate depth about one third of anteroposterior diameter of the chest but not more than 6 cm, allow complete chest recoil, minimize interruption and to avoid excessive ventilation. The aim of this study is to assess the effect of metronome to the quality of cardiopulmonary resuscitation performed and to see the factors that affect the CPR performance among the emergency department staffs of Hospital Sultan Haji Ahmad Shah, Tenterlo, Pahang in 2018. Methods: One hundred and fifty emergency department staffs were enrolled in this study including doctors and paramedics. Each participant need to performed 2 minutes of
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Routine Coagulation Testing in the ED—How Much Does It Add?
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Background and Objectives: The Choosing Wisely initiative launched in 2012 proposes to reduce unnecessary tests, treatments and procedures in healthcare. Coagulation studies were focused on as they are often poorly understood and ordered indiscriminately. Inappropriate test ordering can result in false positive results leading to a cascade of further unnecessary tests and investigations with additional inconvenience and anxiety for patients. At present there are no approved assays to assess the efficacy of DOACs and yet many patients receive coagulation studies for merely being on a DOAC. The aim of this study was to assess the coagulation testing in patients presenting with chest pain to a local emergency department.

Methods: A retrospective analysis of 100 records of consecutive patients presenting to the emergency department with the primary complaint of chest pain was undertaken. The demographics of the patients were recorded along with their drug histories in particular anti-coagulant use. The blood results of these patients were analysed with particular reference to coagulation studies. Results: A total of 81 coagulation samples were received by the laboratory. 32 (40%) had an abnormal result as determined by the reference range. 2 of these (2.4%) had an INR above the therapeutic range (INR > 3). On review of the patients’ notes, 8 of the 81 patients were on Warfarin and 10 were on a DOAC. None of the patients having samples sent had documented evidence of bleeding. 2 patients had further coagulation sampling while admitted to hospital. The cost of these samples amounted to £603.

Conclusions: Though routinely performed on patients presenting with chest pain, the clinical utility of routine coagulation sampling especially in the era of DOACs seems limited and at times wasteful. Reducing unnecessary testing could not only save costs but also improve efficiency and patient experience in the emergency department.

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Prevalence of Multiresistant Bacteria in Danish Emergency Departments
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Background and Objectives: Multiresistant bacteria (MRB) is an increasing problem and spread can lead to increased morbidity and mortality. Attention has been focused in particular to meticillin resistant Staphylococcus aureus (MRSA), but there has also been an increase in the prevalence of extended-spectrum beta-lactamase-producing enterobacteria (ESBL), vancomycin resistant enterococci (VRE) and carbapenem resistant enterobacteria (CPE). The emergency departments (ED) are key players in the in-hospital use of antibiotics and in the early identification of patients who are colonized with MRB. The aim of this study was to describe the prevalence and demographic variation of MRSA, CPE, ESBL and VRE bacteria among acute patients in representative Danish EDs. Methods: The study was a multicenter descriptive and analytic cross-sectional survey of adults visiting eight Danish EDs. Swabs from nose, throat and rectum were collected and analyzed for MRSA, ESBL, VRE and CPE. The primary outcome was the prevalence of MRB, and secondary to describe it with relation to type of colonized bacteria, residency, sex, and age. Results: Of the invited participants 5117 patients were included and analysed. Median age was 68 years (IQR 54-77) and gender was equally distributed. In total 266 (5.2%, IQR 4.6-5.8) of the patient attendances were colonized with at least one MRB. A nonsignificant difference between male and female patients, between age groups, and between university and regional hospitals were observed. Only five of the 266 patients with MRB were colonized with two of the examined bacteria and none with more than two. MRSA prevalence was 0.3% (0.0-0.2), CPE prevalence was 0.1% (0.0-0.2), ESBL prevalence was 4.5% (3.7-5.2), and VRE prevalence was 0.4% (0.3-0.6). Conclusions: Every 20th patient arriving to a Danish ED brings MRB to the hospital, which means that every day several patients will be handled with MRB. ESBL is the most important MRB in the ED.

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MTOR Mediates Neuronal Death Following Transient Global Cerebral Ischemia in the Striatum of Chronic High-fat Diet-induced Obese Gerbils
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Background and Objectives: Recent studies have shown that obesity and its related metabolic dysfunction exacerbates outcomes of ischemic brain injuries in some brain areas, such as the hippocampus and cerebral cortex when subjected to transient global cerebral ischemia (tGCI). However, the impact of obesity in the striatum after tGCI has not yet been addressed. The objective of this study was to investigate effects of obesity on tGCI-induced neuronal damage and inflammation in the striatum and to examine the role of mTORC which is involved in the progression of metabolic and neurological diseases. Methods: Gerbils were fed with a normal diet (ND) or high-fat diet (HFD) for 12 weeks and then subjected to 5 min of tGCI. HFD-fed gerbils showed significant increase in body weight, blood glucose level, serum triglycerides, total cholesterol and low-density lipoprotein cholesterol without affecting food intake. Results: In HFD-fed gerbils, neuronal loss occurred in the dorsolateral striatum 2 days after tGCI and increased neuronal loss was observed 5 days after tGCI; however, no neuronal loss was observed in ND-fed gerbils after tGCI, as a assessed by neuronal nuclear antigen immunohistochemistry and Fluoro-Jade B histoforescence staining. The HFD-fed gerbils also showed severe activated microglia and further increased immunoreactivities of protein and protein levels of tumor necrosis factor-alpha, interleukin-1beta, mammalian target of rapamycin (mTOR) and phosphorylated-mTOR in the striatum during pre- and post-ischemic conditions compared with the ND-fed gerbils. In addition, we found that treatment with rapamycin, a mTOR inhibitor, in the HFD-fed gerbils significantly attenuated HFD-induced striatal neuronal death without changing physiological parameters. Conclusions: These findings reveal that chronic HFD-induced obesity results in severe neuroinflammation and significant increase of mTOR activation, which could contribute to neuronal death in the striatum following tGCI. Especially, abnormal mTOR activation might play a key role in mediating the obesity-induced severe ischemic brain damage.

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Rapid Cooling Induction in Target Temperature Management by Administering Calcium Channel Blocker
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Background and Objectives: Thermoregulation mechanisms in human body play an important role affecting efficacy of surface cooling. We investigated if administra-
tering Calcium Channel Blocker (CCB) can reduce vasoconstriction secondary to surface cooling and consequently facilitate rapid cooling in anesthetized swine model. **Methods:** A pilot experiment was conducted on anesthetized pigs (n=4). Target body temperature of 33°C was induced by way of surface cooling. Nicardipine (0.5-3 µg/kg/min) was administered intravenously to two pigs that were randomly assigned to CCB group. Systemic vascular resistance, cooling induction time from the initial body temperature 36°C to the target temperature 33°C, and cardiac index were investigated. **Results:** Cooling induction time was noticeably shorter for the animal subjects in CCB group (23 min & 14 min) than for those in control group (36 min & 54 min). Median systemic vascular resistance was found to be smaller in CCB group (400 & 388) than in control group (455 & 559). Median and the quartiles of cardiac index values were 6.80 [4.3; 7.2] & 8.50 [5.73; 10.33] in CCB group, and 6.60 [6.0; 7.2] & 7.15 [6.55; 8.43] in control group. **Conclusions:** CCB administration to anesthetized swine facilitated faster cooling induction in our pilot experiment, although further study is imperative. We encourage more research for rapid and safe cooling induction in therapeutic hypothermia and target temperature management. **Corresponding Author:** Sangchun Choi (avenue5933@gmail.com)

**A Novel Mechanical Chest Compressor in Cardiopulmonary Resuscitation**

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**Background and Objectives:** Cardiac arrest is a clinical disaster. The rate of return of spontaneous circulation (ROSC) is low if the quality of cardiopulmonary resuscitation (CPR) is poor. To deliver high quality chest compressions is beneficial to survival rates in patients with cardiac arrest. Traditionally, manual chest compression CPR (M-CPR) is the first management for resuscitation, but the quality of M-CPR is poor and variable because of the fatigue of the rescuers. Environment such as stairs and ambulance decreases the efficiency of M-CPR. Recently, mechanical chest compression CPR sheds light on emergency medical services before arriving hospital. However, some clinical issues which include failing to use in infants or pregnant women, long set-up time, and unable to inclination, remain in current devices. This study aims to designing a novel mechanical chest compression device to accomplish the challenging resuscitation scenario. **Methods:** In our device, we designed an intelligent robotic arms which were operated with flexibility in synchronization of Cartesian coordinate system (x, y, z) and polar system (r, θ) to fasten the set-up time. Additionally, we used a new piston structure with adjustable compression depth and compression area which was compatible in both adults and infants based on CPR guidelines, American Heart Association (2015). Finally, we compared this device with current products (LUCAS® and Thumper®) via pressure pattern analysis. **Results:** The size of this design is 50 cm × 30 cm × 50 cm with the weight of 10 kilograms. The compression depth is shifted between 4 cm and 5 cm with corresponding compression area. The set-up time is less than 30 sec. The performance of core and peripheral compression pressure shows no significant difference to those in LUCAS® and Thumper®. **Conclusions:** This design may provide the innovation and prototype in next generation of mechanical chest compressor and may further increase the survival rate in challenging resuscitation scenario. **Corresponding Author:** Chih-Wei Sung (114228@ntuh.gov.tw)

**Plant-based Vaginal Foreign Bodies as Cause of Acute Urinary Retention in Females**

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**Background and Objectives:** Acute urinary retention is a common presentation to the emergency department. Common causes of in females include obstruction by pelvic organs, infections, medications, or neurogenic bladder. In this report, we present one case of acute urinary retention secondary to vaginal insertion of plant-based foreign bodies. **Methods:** A 68 year old female presented with inability to pass urine for the last five hours. She denied previous similar episodes and was otherwise well prior to her current episode. A urinary catheter was inserted which drained out 800 ml of clear urine. A digital rectal exam revealed an empty rectum but a firm mass was palpated anterior to her rectum. There were no palpable abdominal masses. A vaginal examination revealed multiple impacted fruit seeds within her vagina, measuring up to 4 cm in length. These were removed with forceps with minimal pain. There was a moderate amount of thick whitish vaginal discharge. Her cervix was healthy with no obvious lesions. She was initially not forthcoming but additional history revealed that she had been inserting these plant-based foreign bodies, with the assistance of her friend, to alleviate her vaginal itch regularly. According to her, these foreign bodies would gradually disintegrate and fall out. **Results:** She was subsequently able to pass urine spontaneously and was discharged with antimicrobial pessaries. **Conclusions:** This case illustrates the importance of considering the possibility of vaginal foreign bodies in female patients as a cause of urinary retention, especially in those who do not have clear precipitating causes. This is important in certain patient populations such as the institutionalized, psychiatric, elderly or children as they may not be able to provide clear clinical history. Identifying and removing these foreign bodies promptly is necessary as they can cause complications such as toxic shock syndrome, vaginal infections, or fistulas. **Corresponding Author:** Koh Yiwen (yiwenkoh87@gmail.com)

**Screening Tool For Rapid Discharge of Patients with PV Bleeding in Early Pregnancy**

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**Background and Objectives:** Prospective audit is to identify a group of patients at triage who are at low risk of complications amongst those who present with bleeding in early pregnancy, who can safely be discharged home immediately. **Methods:** A screening tool was developed and nursing staff were encouraged to prospectively screen all presentations. Patient data was also collected prospectively. All patients were virtually followed up regarding outcomes in Ed and at an average of 2 weeks following their assessed presentation. Screening questions yes no. Haemodynamically normal (HR <90 BP >110). <12/40 gestation. Confirmed intra-uterine pregnancy by prior scan? Is the bleeding at or less than a normal period? Mild or no cramping? Blood group rhesus +ve? No fertility assistance? Has GP or LMC with available appointments within 48 hours? Lives locally with car phone available? Age <40. Manageable emotional distress **Results:** Of the 37 patients only 3 met all these conditions, and potentially were safe for immediate discharge. Virtual follow up at an average of 2 weeks after presentation suggest there were no representations or other complications 45.9% of forms were incompletely or incorrectly completed. Around 45% of patients with PV bleeding in early pregnancy were discharged after assessment without later complications. 55% required some intervention or admission during the assessed presentation. **Conclusions:** In summary only 8% of patients were safe for discharge using the above screening tool, none of whom had any later complications. This percentage is too low to justify use of this tool as the time taken screening is unlikely to be recouped with the time savings of early discharge. Furthermore the screening tool itself however was not reliable with 45.9% being inaccurately or incompletely completed at the time of assessment. **Corresponding Author:** Sylvia Boys (sylvia.boys@xtra.co.nz)

**“Are You Sure I’m Positive??”- a Case Report of Ruptured Ectopic Pregnancy After Bilateral Tubal Ligation**

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**Background and Objectives:** Female sterilization by tubal ligation is an increasingly common method of contraception. It is considered a permanent form of contraception because of its low failure rate, however when there is conception it is likely to be an ectopic pregnancy which is a major cause of morbidity and mortality in women of reproductive age in the 1st trimester of pregnancy. **Methods:** She was a 34 year old Para 3 who presented with history of 5 days suprapubic pain. Associated with frequency. There was no history of abnormal PV bleeding, fever or gastrointestinal symptoms. Her LMP was about 3 weeks prior to admission. She has had 3 previous caesarean sections and bilateral tubal ligation was done for her during the last caesarean section. Clinically she was hemodynamically stable. Her UFEME was suggestive of UTL. Bedside TAS showed empty uterus with
minimal fluid in POD. Subsequently UPT was ordered and came back positive. Patient was treated as ectopic pregnancy and was referred to O&G team. TVS was done noted right adnexal mass. Patient underwent emergency laparotomy and bilateral salpingectomy. Results: Although pregnancy after bilateral tubal ligation is uncommon, when it occurs it is a source of utmost concern to the patient and her attending physician because of the higher chance of an ectopic pregnancy which could be life threatening. The likelihood of an ectopic pregnancy will vary according to the method of sterilization and the age at which the woman underwent the sterilization procedure. Conclusions: Diagnosis of ectopic pregnancy after bilateral tubal ligation requires a high index of suspicion so as to reduce the morbidity and mortality associated with this condition. It should therefore be considered in women of reproductive age presenting with lower abdominal pain and or amenorrhea even if they had had tubal sterilization.

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Endoscopic Extraction of Methamphetamine Packet Causing Oesophageal Obstruction
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Background and Objectives: Oesophageal obstruction among body stuffers, who haphazardly ingest drug packets to evade police arrest, remain to be rarely reported. Limited studies have been published on its occurrence while conflicting recommendations have been cited on the role of endoscopy as the definitive management. This case report aims to present oesophageal obstruction as a rare consequence of body stuffing among prohibited drug users and to recognize the role of endoscopy in its successful management. Methods: The case was documented in the University of the Philippines-Philippine General Hospital Emergency Department. Relevant clinical information were retrieved during the patient’s hospitalisation. Results: A case of a 36-year old man, who came in the emergency department due to chest pain after in-gesting a methamphetamine packet sealed in a plastic sachet and wrapped with a plumber’s tape resulting in complete oesophageal obstruction, is presented in this report. No clinical toxicity was observed. Esophagoscopy with foreign body extraction was done. An intact 3.0×3.0×3.0 cm spherical dark brown packet containing 300 mg of methamphetamine was successfully extracted without complications. Conclusions: Thus, a case of methamphetamine packet causing oesophageal obstruction successfully removed through a non-invasive endoscopic technique was presented in this case report.

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EM Mentoring in the Pacific: a New Model of Mentoring
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Background and Objectives: Emergency medicine (EM) is a growing specialty around the Pacific region. For the few, newly-trained EM doctors leading emergency care developments in their countries, isolation and burnout are substantial risks. In 2016 a mentoring program commenced, that matched Pacific Island EM doctors with Australasian EM specialists, and was adapted from Australian College for Emergency Medicine (ACEM) resources. This paper describes the development, implementation and evaluation of the Pacific EM Mentoring Program. Evaluation research questions include the feasibility, challenges and successful components for this remote, multi-country mentoring program. Methods: This was a prospective, qualitative study using a survey with free-text responses for all participants; mentees and mentors. Sections explored six components of the program; mentoring relationship, communication, resources, outcomes, perspectives and knowledge and overall feedback. Researchers independently and then collaboratively used an inductive approach and applied open, axial and selective coding for content and thematic analysis. Results: There were 19 total participants (11 mentees, 8 mentors) who all completed surveys, giving a 100% response rate. Five core themes emerged from the data; vital face-to-face communication; supportive personal relationship; motivating professional relationship; substantial challenges; and, issues around the Mentoring Model. Despite time, distance and remote communication, mentees used critical face-to-face opportunities to establish a personal and professional relationship with mentors. Differences emerged between mentors and mentees in understanding of mentee-driven, goal-directed development, with
the role of Pacific Islands culture and context under-estimated. **Conclusions:** This is the first descriptive and qualitative analysis of a multi-country medical mentoring program for the Pacific, and recommends a relational, not goal-oriented focus that is both mentee and mentor driven, and has a flexible structure. Future mentoring programs should be resourced to ensure face-to-face opportunities and better mentoring preparation.

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**Power Law Distribution of the Number of Patients in Emergency Departments in South Korea Using Data From National Emergency Department Information System Based on Big Data Analysis**

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**Background and Objectives:** While traditional physics theories were applicable in the natural system of equilibrium, there were limitations in explaining the upheaval of a critical state. Physics, which describes this turbulent state as the Chaos Theory, has recently emerged. The power law distribution refers to the point of transition from equilibrium to chaos as the critical value (alpha). And the distribution of power law, initially based on physics, has been discovered in many other areas such as biology, sociology, and medicine. In this study, the National Emergency Department Information System (NEDIS) data, collected from 2014 to 2016, were used to verify the distribution of patients who visited emergency departments in South Korea following the power law distribution. **Methods:** Data preprocessing was performed using the pandas 0.23.4 package of Python 3.6 to analyze 25,402,832 cases out of 25,545,841 cases. Statistical methods were performed using the poweRlaw package of R 3.5.1. **Results:** In this study, we analyzed the power law distribution of the number of patients in emergency departments per day, divided into nationwide (25,402,832 cases), metropolitan cities (11,496,602 cases), and provinces (13,906,230 cases). In our analysis of nationwide data, the two-sided p-value was 9.5 when Xmin = 17,500 and alpha value = 5.4, and the p-value was 0.07 when Xmin = 8,000 and alpha value = 4.7 for metropolitan cities, while the p-value was 3.5 when Xmin = 9,750 and alpha value = 5.1 for provinces. **Conclusions:** Nationwide, metropolitan city, and province data followed the power law distribution in the range of alpha values from 4.7 to 5.4.

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**PO_OTH_04_05**

**The Role of Hybrid Emergency Room System at an Emergency Department in Tokyo**

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**Background and Objectives:** The Hybrid Emergency Room System (HERS) is defined as the resuscitation room with an interventional radiology (IVR)-computed tomography system (CT), which enables us to perform evaluation and resuscitative treatment in one room without transferring patients to other places. We have used this system at an urban ED since July 2017. The purpose of this study was to evaluate the role of HERS for our patients. **Methods:** We conducted the retrospective chart review in single ED, included consecutive cases which were transferred to HERS directly. **Results:** We had 1,645 cases in total, and 277 cases in TO, 836 cases in MG, 368 were in CG, and 164 were in others, respectively. In TO, 168 (60.6%) were treated in HERS, and most of them were blunt injuries (167/168; 99.4%). In MG, 203 cases (24.3%) were evaluated and resuscitated in HERS, and the cerebral vascular diseases (80/203; 39.4%) were most often treated in HERS. For the patients complaining dyspnea (n = 187), 167 patients (89.3%) were treated in conventional resuscitation room. In CG, 44 cases (12.0%) were brought up to HERS directly, and 14 were provided extracorporeal circulation (ECC) subsequently under the fluoroscopic guide in same room. **Conclusions:** HERS might be a beneficial modality to diagnose see more quickly and safety for blunt trauma, unconsciousness cases suspecting cerebral vascular disease, and CPAOA with the candidate for ECFR. Further investigation should be needed to indicate the appropriate usage criteria of HERS.

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**PO_OTH_04_06**

**International Examination and Synthesis of the Primary and Secondary Surveys in Paramedicine**

Sonja Maria, Marc Colbeck, Georgette Eaton, Craig Campbell, Alan Baith, Matt Caffey

**Background and Objectives:** To guide their care paramedics routinely rely upon two assessment and treatment algorithms, known as the primary survey and the secondary survey. No clear consensus of the concepts (assessments and interventions) that are, or should be, included in these algorithms exist internationally. **Methods:** This paper evaluated Australasian paramedic clinical practice guidelines (CPGs), as well as six other international paramedic CPGs (USA, Ireland, UK, South Africa, Qatar, and the United Arab Emirates) in order to identify which concepts are currently described in best-practice recommendations for paramedics. The authors also contributed concepts that they felt were important additions based on their experience as veteran paramedics and paramedic educators. **Results:** The resulting amalgamation of concepts identified in each term was then formed into two mnemonics which, together sequentially list approximately 100 specific clinical concepts that paramedics routinely consider in their care of patients. We describe these as the “International Paramedic Primary and Secondary Surveys”.

**Conclusions:** The primary and secondary surveys presented in this paper represent an evidence-based guide to the best practice in conducting a primary and secondary survey in the paramedic context. Findings will be of use to paramedics, paramedic students, and other clinicians working in remote or isolated practices.

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**PO_OTH_04_07**

**Suppression of Pain in Renal Stones Using Transcutaneous Electrical Nerve (TEN) Stimulation**

Umadevan Rajasagaram

**Background and Objectives:** Kidney stones are prevalent in the “stone belt” region which extends over America (Southeast), Africa (North), Middle East (Southeast) and Australia (Northeast). Globally, the lifetime prevalence of stone disease is 10 to 15% and it counts for millions of patient visits to the emergency department (ED), or the outpatient clinics. The main aim of management in the ED is to provide fast, effective and safe analgesia to patients. The most commonly prescribed analgesia in renal colic are non-steroidal anti-inflammatory drugs (NSAIDS), opioids and paracetamol. Most studies published in relation to the acute management of pain in renal colic focuses on the use of prescribed analgesia as described above with little emphasis on the use of other modalities of pain control such as TENS. **Methods:** This is a prospective randomised control study in determining the degree of pain experienced as well as the type and dosage of pharmacotherapy prescribed to patients with a confirmed renal colic presenting to the Emergency Department (ED), in relation to the use TENS. **Results:** This was a Pilot study with 10 cases-5 cases in each arm. The active arm of the study (A) showed a median decrease of pain by 4 points, the size of the renal stones were approximately 2 mm to 6 mm. The passive arm of the study (B) median decrease of pain by 2 points and the stones were approximately 2 mm to 5 mm. The use of pharmacological analgesia was i/v morphine (2.5 to 10 mg), oxycodone (5 to 10 mg) and non-steroidal anti-inflammatory (NSAIDS) such as indomethacin (25 to 75 mg) which were similar in quantity for both arms. **Conclusions:** Our pilot study has shown that the use of TENS has been able to decrease pain without any side effects.

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**PO_OTH_06_01**

**Cecal Volvulus Occurring After Colonoscopy: a Case Report**

Nicole Ann Tandayu, Richard Vincent Dimagiba

1International Examination and Synthesis of the Primary and Secondary Surveys in Paramedicine
Background and Objectives: Cecal volvulus is an infrequently encountered clinical condition and an uncommon cause of intestinal obstruction. It is characterized by twisting of the colonic segment to its mesentery. A rarer incident of colonooscopy induced cecal volvulus is discussed in this article. Methods: NA. Results: This is a case of a 51 year old Filipino male who presented at the Emergency Department with abdominal pain after colonooscopy for gastrointestinal tuberculosis with abdominal plain films showing complete gut obstruction which led to his demise and eventual post mortem study, revealing a massively dilated and gangrenous bowel loops with cecal volvulus. Conclusions: Although colonooscopy is a generally safe procedure to which the most common complication is perforation, cecal volvulus is one of the rare complication that is associated with the manipulation and air insolation of the colon during the procedure. A high index of suspicion for patients presenting in the emergency department with abdominal pain after colonooscopy would decrease morbidity and mortality. Corresponding Author: Richard Vincent Dimagiba

PO_EMS_01_01

Impact of the Caller’s Emotional State and Cooperation on Out-of-hospital Cardiac Arrest Recognition and Dispatcher-assisted Cardiopulmonary Resuscitation
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Background and Objectives: The dispatcher-caller interaction characteristics influence whether or not a dispatcher recognizes an out-of-hospital cardiac arrest (OHCA) and provides the dispatcher-assisted cardiopulmonary resuscitation (DA-CPR) instruction. This study aimed to determine the impact of the caller’s emotional state and cooperation on OHCA recognition and DA-CPR performance metrics. Methods: This was a retrospective study that collected data between November 2015 and October 2016 at the dispatching center in northern Taiwan. Telephone audio recording files of adult patients with non-traumatic OHCA were reviewed and analyzed to gather information regarding caller’s emotional content and cooperation score (ECCS), OHCA recognition rate, time to key events, and barriers to DA-CPR. Results: Of the 367 eligible cases, 336 (91.6%) callers were assigned with low-to-moderate ECCS and considered cooperative (ECCS 1 to 3) with a good interrater reliability (k=0.63). Dispatchers recognized OHCA in 251 (68.4%) cases. ECCS 3 callers were more likely to give unambiguous responses to the patient’s breathing status (adjusted odds ratio [AOR]=2.646, 95% confidence interval (CI) [1.101–6.371]), thus leading to a significantly higher rate in OHCA recognition (AOR=2.928, 95% CI [1.057–4.993]). Despite the significantly lower DA-CPR instruction delivery rate (54.2% vs. 85.9%, p<0.005) due to the factors of “caller refused” and “overly distraught”, the uncooperative (ECCS 4–5) caller group had shorter median times to OHCA recognition and chest compression (29s and 122s, respectively) compared to the cooperative caller group (35s and 170s, respectively). Conclusions: The caller’s emotional state may be a barrier to OHCA recognition but may be a barrier to delivery of DA-CPR instruction. However, DA-CPR instruction delivery followed by first chest compression is possible if dispatchers are able to skillfully reassure the emotional callers. Corresponding Author: Cheng-Yu Chien (raincy217@gmail.com)

PO_EMS_01_02

The Effects of Different Instructional Guidance on Quality of Chest Compressions
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Background and Objectives: Current evidences reveal that chest compression with rate 100-120 beats per minute (bpm) during cardiopulmonary resuscitation (CPR) improves survival most. We evaluated and compared the effects of different instructional guidance on quality of chest compressions. Methods: In this randomized-controlled study, students from two senior high schools were assigned into two groups since November, 2014. For experimental group, the instructional guidance of compression rate was “two beats per second”. For control group, the instructional guidance was “at least 100 bpm”. Except different instructional guidance, all participants underwent a standardized CPR training program, including video-based lecture and hands-on practice. Verbal feedback on chest compression rate was prohibited during practice. Quality of chest compressions was assessed by Laerdal SkillReporter. Results: We recruited 164 participants with 85 participants in the experimental group. There were no differences between two groups in age, gender, CPR training experiences, knowledge, or skills. After training, nearly all participants in both groups achieved adequate compression rate (>100 bpm) at course conclusion (99.4 ± 1.7% vs. 99.5 ± 1.4%, p=0.93) and three month later (99.4 ± 2.1% vs. 98.0 ± 8.3%, p=0.20). Nevertheless, experimental group had lower mean rate at course conclusion (144.3 ± 16.2 vs. 152.7 ± 18.4, p=0.003) and three month later (139.0 ± 17.7 vs. 144.0 ± 17.3, p=0.09). Conclusions: The instructional guidance influenced the quality of chest compressions and “two beats per second” was more effective, and avoid over-speeding chest compressions. Corresponding Author: Chih-Wei Yang (cywang0413@gmail.com)

PO_EMS_01_03

Reliability of the Korean Triage and Acuity Scale: Interrater Agreement Between Two Experienced Nurses by Real-time Triage For the Same Patient
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Background and Objectives: Reliability between classifiers during the triage process is an essential condition of a triage tool; however, Korean Triage and Acuity Scale (KTAS) has been used without verification of its reliability. In this study, we assess the interrater agreement of KTAS and analyse the influence of disagreement in complaints and modifiers on KTAS levels. Methods: This study was a prospective observational study conducted with patients who visited two emergency departments (ED). Two classifiers were composed of one team. Two teams triaged patients in each ED and classifiers recorded KTAS level by selecting the main complaint from the list of 167 KTAS complaints, as well as the first- or second-order modifiers. Interrater reliability between the two classifiers was assessed by weighted-kappa. Pearson’s Chi-squared test was conducted to determine if there were differences between each classifier’s KTAS levels, depending on whether they chose the same complaints and the same modifiers or not. Results: Two teams totally triaged 1,998 patients who visited each ED. Weighted-kappa value was 0.772 (95% CI 0.730, 0.794). Patients triaged by different chosen complaints showed (38.0%) higher inconsistency rate in KTAS levels than those triaged by the same complaint (10.9%, p<0.001). When classifiers chose the same complaint and different modifiers, the ratio of different levels (50.5%) was higher than that of the same complaint and same modifier (8.1%, p<0.001). Conclusions: This study showed that KTAS is a reliable tool. Selected complaints and modifiers were confirmed as important factors; therefore, selecting them properly should be emphasized during KTAS training course. Corresponding Author: Joonbum Park (jesumania@gmail.com)

PO_EMS_01_04

Characteristics of Frequent User of Emergency Department Using a National Health Insurance Cohort Data
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Background and Objectives: The purpose of this study is to determine the characteristics of frequent user of emergency department using a national health insurance (NHI) cohort in south korea. Methods: We used the NHIS sample cohort database version 2.0. Frequent user of emergency department were defined as those who visited the emergency room three times and more in 12 months. A total of 288,391 people visited the emergency room more than once during the period from 2011 to 2015, of whom 31,638 (11%) were frequent users. Results: The male ratio of frequent user group (FG) was higher than non frequent user group (non-FG) (FG:0.55% vs. 11.8%). The mean age of FG was higher than that of NFG (41.3 ± 29.3 vs. 38.3 ± 22.3). The most common age group was 0-9 years old (25.8%) in FG and 30-39 years old (15.6%) in NFG group. FG had more “medical care” than NFG (7.9% vs. 3.8%). And FG had more disabilities than NFG (12.7% vs. 6.5%). We compared the FG and NFG of each age group by extracting only the critical illness in the main diagnosis during the visit to the emergency room. In 0-19 years old, the 1st diagnosis was G3 (Meningitis due to other and unspecified causes) in both FG and NFG. In 20-49 years old, the 1st diagnosis was S06 (Intracranial injury) in FG, but was K35 (Acute appendicitis) in NFG.
In 50 years old and older, the 1st diagnosis was I21 (Acute myocardial infarction) in both groups. **Conclusions:** The age groups of the frequent user group was distributed widely at both ends. Frequent user group had many medical care recipients and many disabled peoples than non-frequent user group. In addition, the reasons for frequently visiting the emergency department by age group were different.

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**Association Between Use of Prehospital Mechanical CPR Device For Out-of-hospital Cardiac Arrest and Outcome by Patient Transport Interval: Pilot Study**

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**Background and Objectives:** In this study, we aimed to investigate effect of mechanical CPR device (MechCPR) on OHCA by patient transport interval (PTI). We hypothesized MCPR is effective on survival with prolonged PTI (P-PTI).

**Methods:** This is an observational study using Korean Cardiac Arrest Research Consortium (KoCARC) data from October 2015 to Jun 2018. EMS treated OHCA presumed of cardiac etiology without field return of spontaneous circulation (ROSC) was included. Patients with less than 15 years old, with unknown information of MechCPR, PTI and outcome were excluded. Exposure was prehospital MCPR use and outcome was survival to admission. PTI was defined as time interval between scene to hospital. P-PTI was defined if PTI longer than 9 minutes and NP-PTI if less. Multivariable logistic regression by PTI group (reference=manual CPR) was performed to calculate adjusted odds ratios (AORs) with 95% confidence intervals (95% CIs) for outcome.

**Results:** From total 2,214 OHCA patients, rate difference of survival to admission in NP-PTI group comparing no-MCPR to MCPR was -3.44% (-11.95% to 5.08%) and in P-PTI -4.34% (-11.14% to 2.46%). In multivariable logistic analysis adjusted OR was 1.63 (0.94-2.85) in NP-PTI group and 1.74 (1.14-2.67) in P-PTI group.

**Conclusions:** For OHCA with PTI 9 minutes or longer, MechCPR was associated with survival to admission for patients failed to be restored in field. Based on this pilot study, further study in larger population is needed to investigate optimized use of MechCPR for survival benefit.

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**Impaction of the Time to Reperfusion in Patients with ST-elevation Myocardial Infarction Arrived by Helicopter vs. Ground vs. Self-transport**

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**Background and Objectives:** Many patients with ST-elevation myocardial infarction (STEMI) require inter-hospital transfer for primary percutaneous coronary intervention (PCI) by ground emergency medical service (GEMS) or helicopter emergency medical service (HEMS). And STEMI patients arrived at a hospital via self-transport. We aimed to investigate effects of HEMS on initiation of reperfusion in STEMI patients admitted for primary PCI. **Methods:** In this retrospective cohort study, we include patients with STEMI and symptom duration less than 24 hours within the region covered by HEMS from January 1, 2016, to June 31, 2017, transported by either HEMS or GEMS or self-transport to the regional PCI center. We analyzed patients’ characteristics, time interval according to transfer process and in-hospital treatment between three groups (HEMS vs. GEMS vs. self-transport).

**Results:** We studied 125 STEMI patients transported by either HEMS (n=38) or GEMS (n=56) or self-transport (n=31). Baseline characteristics were similar between 3 groups. Median inter-hospital transport time was shorter for the HEMS group than for the GEMS group (44 minutes vs. 54 minutes; p=0.049). Median door-to-balloon time was longer for the GEMS group than the HEMS and the self-transport group (68 minutes vs. 56 minutes vs. 59 minutes; p<0.01). Median PCI team activation time was shorter for the HEMS group than for the GEMS group and self-transport group (14 minutes vs. 20 minutes vs. 19 minutes; p<0.01). Median PCI team activation to balloon time was not statistically different between 3 groups (43 minutes vs. 40 minutes vs. 44 minutes; p=0.51).

In hospital mortality was not statistically different between the 3 groups (10.9% in the GEMS group vs. 10.5% in the HEMS vs. 6.5% in the self-transport; p=0.74).

**Conclusions:** In our study, in STEMI patients transported by HEMS, earlier primary PCI initiated because of the shortened PCI team activation time.

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**Electric Scooter Injuries-a Study of Descriptive Records by Singapore Emergency Medical Services**

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**Background and Objectives:** The use of electric scooters (e-scooters) as Personal Mobility Devices (PMD) is becoming more prevalent amid Singapore’s push to a ‘car-lite’ city. This study aims to characterise incidents involving e-scooters attended to by Singapore Civil Defence Force (SCDF) ambulances in a 9-month period in 2017.

**Methods:** The study aims to investigate effect of e-scooters on traffic accident patients during delivery and 1 month post-hospital treatment. Data were then analyzed to determine the relationship between factors affecting the survival of traffic accident patients during delivery and 1 month post-hospital treatment.

**Results:** The results of this study indicated that total number of traffic accident patients was 421,268 in 2017. The suferers were included 291,998 following the inclusion criteria. The Factors affecting the survival were female gender (ORadj 1.75, 95% CI 1.61-1.89), age 19-30 years old (ORadj 1.75, 95% CI 1.58-1.93), response time ≤ 8 min (OR adj = 0.94, 95% CI 0.89-0.99), scene time ≤ 10 min (ORadj 1.91, 95% CI 1.75-2.09), hospital to scene ≤ 10 km (ORadj 1.82, 95% CI 1.86-1.87), single injury (OR adj 1.79, 95% CI 1.62-1.99) and efficient out-of-hospital care (ORadj 14.31, 95% CI 11.4-17.96).

**Conclusions:** The results of this study showed that factors affecting the survival of traffic accident patients during delivery were female gender, age of 19-30 years old, response time ≤ 8 min, scene time ≤ 10 min, hospital to scene ≤ 10 kms, single in-volving e-scooters. Although PMDs offer convenience and increased mobility, public safety education and legislation may have to be considered to manage the potential for injuries and enhance road safety for users and pedestrians.

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**Factors Affecting the Survival Rate of Prehospital Traffic Accident Patients in Thailand**

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**Background and Objectives:** Since 2008, National Institute for Emergency Medicine(NIEM) has been set up in Thailand for improving EMS. They has built up the information online for data accumulation.Our team received data from NIEM in 2017 for analysis and evaluation in survival factors of traffic accident. To determine factors affecting survival of traffic accident patients during delivery and 1 month post-hospital treatment. **Methods:** A retrospective descriptive study was conducted by exploring traffic accident patients who called for emergency medical service.

**Results:** The results of this study indicated that total number of traffic accident patients was 421,268 in 2017. The suferers were included 291,998 following the inclusion criteria. The Factors affecting the survival were female gender (ORadj 1.75, 95% CI 1.61-1.89), age 19-30 years old (ORadj 1.75, 95% CI 1.58-1.93), response time ≤ 8 min (OR adj = 0.94, 95% CI 0.89-0.99), scene time ≤ 10 min (ORadj 1.91, 95% CI 1.75-2.09), hospital to scene ≤ 10 km (ORadj 1.82, 95% CI 1.86-1.87), single injury (OR adj 1.79, 95% CI 1.62-1.99) and efficient out-of-hospital care (ORadj 14.31, 95% CI 11.4-17.96).

**Conclusions:** The results of this study showed that factors affecting the survival of traffic accident patients during delivery were female gender, age of 19-30 years old, response time ≤ 8 min, scene time ≤ 10 min, hospital to scene ≤ 10 kms, single in
Assessing Geographical Factor that Delayed Ambulance Response Time Using AVL-GIS: a Cross-Sectional Study at Hospital Universiti Sains Malaysia

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Background and Objectives: Ambulance Vehicle Location and Geographic Information System (AVL-GIS) usage in ambulance services in Malaysia is very limited. The common factor for delayed ambulance response time worldwide is the geographical factor such as road condition, distance and scene location which are unmodifiable. This study is to identify the local hotspot area for ambulance response and to assess any geographical factor that contributes to delay ambulance response time using the AVL GIS data. Geographical factors that assess in this study are road condition, scene location, the presence of nearby primary health clinic, alternative route, distance and access from the main road. Methods: Ambulance Response Time from Geomapping result, we found that there were 2 local hotspot areas within the ambulance service coverage (5 km radius). Both areas are located on the main road of the city and away from the healthcare service that allow private car. For the location that recorded the most delayed response time, it is found that it was in a remote area with no building within a kilometre nearby. Maximum distance of ambulance travelling within this study period is 15.75 km with mean travelling distance is 4.2 km.

Conclusions: Geomapping using AVL-GIS helps prehospital service to identify the local hotspot area to allocate mobile EMS in future to that area to reduce the response time. The EMS team that responds to the known location of delayed should reduce other modifiable factors that can contribute to response time such as call processing and team activation time.

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Effectiveness of Real-time Ventilation Feedback Device For Guiding Adequate Minute Ventilation During Simulated Cardiopulmonary Resuscitation

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Background and Objectives: During cardiopulmonary resuscitation (CPR) defibrillation prior to the arrival of emergency medical services (EMS) have improved survival from out-of-hospital cardiac arrest (OHCA) with good neurological outcome. However, bystander CPR occurred in 24.3% of OHCA cases locally but bystander defibrillation was only 1.1%. Methods: In 2015, the R-AEDI (Registry for AED integration) initiative was started. It compromises 3 key components: 1) Alerting volunteers to nearby cardiac arrest cases via the ‘myResponder’ mobile app. 2) Building a national registry of publicly accessible AEDS. 3) Building an electronic registry of members of the public trained in CPR. From 2015-2017, 7018 AEDs had been mapped in Singapore, and the number is expected to increase over time. To date, there are around 440 private companies that have registered their AEDs under the R-AEDI registry. The number of non-functional AEDs has also decreased year-on-year (289 in 2015 to 71 in 2016 and 47 in 2017) under this programme as the AED owners are educated on the importance of maintaining the pads and batteries and are sent reminders when they are due for replacement. Through the AED heat map which contains the geolocation of the reported AEDs, we are able to identify areas devoid of public access AED, and further analysis will be undertaken to improve the AED coverage. Conclusions: To improve the survival rates of cardiac arrest victims in Singapore, it is imperative that we concentrate on our community efforts to encourage primary prevention. Roadshows and CPR/AED training programs are conducted regularly to dispel AED myths and educate the public on the usage of the devices. The online AED registry is useful in locating public AEDs rapidly during cardiac arrests, and further analysis of cardiac arrest data will help ascertain the appropriateness of our current AED coverage, and guide future AED placement.

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**PO_EMS_05_06**

**Association Between Socioeconomic Variables and the Pre-hospital Delay in Acute Ischemic Stroke Patients in Korea**

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**Background and Objectives:** The effect of socio-economic status (SES) of the patient on pre-hospital delays was different in several studies, as the healthcare system were different. We investigated effect of SES on the pre-hospital delays and using public emergency medical service (EMS). **Methods:** We analyzed the data collected as Cardiovascular Surveillance (2006-2010). Among the patients diagnosed with acute cerebral infarction in the emergency department, age over 18 years and arrived at the final hospital within 24 hours were included. Education level, occupation type, and medical insurance status was collected as the individual level of SES. The area level of SES was classified into quintile according to the regional deprivation index. The association between SES and early arrival, symptom onset to stroke unit within 3 hours, or use of EMS was examined using multivariate multilevel logistic regression to reflect regional differences. **Results:** Total 13,782 patients were analyzed. The area level of SES was not significantly associated with early arrival. At the individual level, the adjusted OR (aOR) for early arrival among non-manual occupation group was 1.13 (95% CI 1.02 to 1.26) compared to manual, and young age group (age under 65) was 1.19 (95% CI, 1.09 to 1.29) compared older group. The aOR (95% CI) for EMS use was 1.28 (1.08-1.76) in the least deprived areas compared to the most deprived areas. However, patients with national health insurance or young age group were less likely to use EMS. **Conclusions:** We found that deprivation index was significantly associated with EMS use but not with early arrival. In addition, individual SES showed different impacts in early arrival and EMS use. As the effect of individual and area SES on pre-hospital delays are mixed, various levels of public education strategies are needed in order to reduce the arrival time in acute cerebral infarction.

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**PO_EMS_05_07**

**Simulation of Healthcare Provider’s Safety on Emergency Transportation Using Advanced Airway: Extension Airway and Conventional Airway Simulation**

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**Background and Objectives:** Healthcare providers are exposed to risky environment during prehospital transportation when they give O2 supply to patients. This study analysis the problems about risky environment during prehospital transportation and suggest safe and efficient O2 supply methods through extension tube simulation. **Methods:** 57 volunteers participated the experiment. Volunteer’s back angle was measured during transportation simulation. This study measured Grip strength difference and forearm circumference difference in two situations. Without extension tube and with extension tube, participants measured grip strength and forearm circumference twice. Before and after they give O2 supply to mannequin for 5 minutes. And participants replied that which body part is most discomfort area.

**Results:** Without extension tube group, grip strength decreased 10.9 ± 1.3%. With extension tube, grip strength decreased 3.7 ± 0.48%. There was significant difference in grip strength decrease in both group (p < 0.05). There was no significant difference in forearm circumference. With extension tube, 43.9% participants had no discomfort when they give O2 supply. **Conclusions:** Extension tube improved healthcare provider’s safety and O2 supply convenience during pre-hospital transportation.

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**PO_EMS_05_08**

**Factors Associated with the Waiting Time For Admission to the Emergency Department in a Tertiary Hospital**

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**Background and Objectives:** The overdemand on emergency department (ED) decreases the quality of these services. The objective is to determine the waiting time for admission (WTA) to the different areas of the ED and to identify the associated factors for the extended waiting times. **Methods:** Cross-sectional study. Population: Patients admitted to the ED from a tertiary hospital of the Health social insurance. Sample: 380 admissions during June, 2018. We evaluated the waiting time from triage, the admission indications, and its effectiveness. Statistical analysis: Kruskal-Wallis and Chi-square tests using SPSS-IBM 24.0. **Results:** Age was 69 years old (Interquartile Range 16). Females 51%. WTA Median was 12.5 hours (1.1 to 112.9 hours). WTA by priority to Admission: 14.3, 12.3 and 11.1 hours for Priorities 1, 2, and 3 respectively (p = 0.22). Those admitted to Priority 1 (Shock Trauma) 24.2% classified from Triage and additionally 7.6% redirected from other priorities. WTA for those patients whose priority had been changed was 3.99 hours and those unchanged were 0.67 hours (p = 0.014). WTA for admission to Critical Rooms in the ED was 32.6 hours and general emergency rooms 11.8 hours. Reasons for admission delay: 37% reported unavailable stretcher, no definite reason 60%. The time between the first medical evaluation and the indication for admission was 0.37; 0.96 and 3.59 hours for Priority 1, 2 and 3 respectively. The 5.8% waited more than 4 hours for an indication for admission. WTA 27.9% were given no destination and 13% were admitted to another room. 3.7% were discharged from ED and 1.8% (7 patients) died before they were admitted. **Conclusions:** The median WTA was 12.5 hours. Factors associated with the delays were: stretcher unavailability in ED, priority 1 admissions, change of priority following the first assessment and admissions to Critical Care Unit.

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**PO_ESM_05_09**

**An Observational Study on the Effects of Therapeutic Hypothermia in Elderly Patients with Out of Hospital Cardiac Arrest: a Propensity-matched Analysis**

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**Background and Objectives:** The therapeutic hypothermia (TH) protocol is not standardized and the decision to apply TH relies on a physician’s judgment. Elderly patients who rely on this judgment are less likely to benefit. This study aimed to provide an analysis of the impact and utility of TH on elderly patients. **Methods:** This was a multicenter, retrospective, observational, registry-based study. Adults who suffered out-of-hospital cardiac arrest and were treated with TH were included. We divided the patients into a group of elderly patients 65 years or older and a group of young adults under 65 years old and compared the neurologic outcomes and adverse events after one-to-one matching by propensity score. **Results:** In total, 930 patients were enrolled in the study. Among these patients, 343 were ≥ 65 years, while 587 were < 65 years. Of the adverse events in TH, hyperglycemia (51.3%), hypotension (41.98%) during cooling was more frequent in aged ≥ 65 years and rebound hyperthermia (7.14%) and hypotension (29.93%) during rewarming. After propensity score matching was applied to all subjects of the study, 247 matched pairs of patients were available. The two groups showed no statistically significant difference in the adverse events during TH. **Conclusions:** Elderly patients exhibited a decreased survival to hospital discharge and good neurologic outcomes. The two groups showed no differences in the frequency of adverse events during TH, when comparing in a propensity score matching cohort analysis.

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**PO_RES_01_01**

**Changes of Three-dimensional Shapes and Functional Behaviors of Red Blood Cells After Cardiac Arrest**

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**Background and Objectives:** Red blood cells (RBCs) have important roles in tissue oxygen delivery. Previous studies showed changes of morphology and rheologic behavior of RBCs in various clinical conditions of ischemia/reperfusion injury such as sepsis, severe trauma, and critically ill patients. Global I/R injury also has important roles in the pathophysiologic of cardiac arrest victims. However, few studies evaluated about RBCs of postcardiac arrest. We wanted to evaluate the morphologic and functional status of the RBC during post-cardiac arrest care.

**Methods:** We prospectively enrolled successful resuscitated OHCa adult patients after informed consents. Blood samples were taken daily and only during ICU stay. Patients expected death within 24 hr or DNR status were excluded. Morpho-
logical, biochemical and mechanical properties of RBCs were retrieved from the cDOT microscopy. All the parameters are measured within 1 hour after collections of samples. Results: Total 40 patients were enrolled. Survival was observed in 25 (62.5%). Favorable neurologic outcome (Cerebral Performance Category 1 or 2) at 28-day after cardiac arrest was 10 (25%). Membrane fluctuations of day 3 (59.12 vs. 55.61 nm, p < 0.001) and day 5 (59.28 vs. 55.68 nm, p = 0.027) higher in survivors. ISs of day 3 (0.61 vs. 0.68, p < 0.001) and day 5 (0.62 vs. 0.64, p = 0.044) were lower in survivor. With generalized mixed Linear models analysis, functional outcome of 28-day after cardiac arrest failed to show meaningful correlation to membrane fluctuation nor SI. Conclusions: Morphologic and functional differences of RBCs were present in 3 and 5 days after cardiac arrest between survivors and non-survivors. Corresponding Author: Jongwhan Shin (skyshiner@naver.com)

Relationship Between Hypocholesterolemia and Poor Neurologic Outcome in Patients Resuscitated From Out-of-Hospital Cardiac Arrest
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Background and Objectives: Low cholesterol level reflects the nutritional status of the patients and has been reported to be used as a bad prognostic indicator in patients receiving ICU treatment in previous studies. This study aims to compare the relationship between initial blood cholesterol level and neurological outcome in adult out of hospital cardiac arrest patients. Methods: This retrospective cohort study included patients hospitalized in survival state after out-of-hospital cardiac arrest among Korean cardiac arrest research consortium (KoCarc) Registry during 1 October 2015 to 30 June 2017. We investigated variables including first serum cholesterol level. The main outcome was poor neurologic outcome defined by Cerebral Performance Categories (CPC) 3-5 at discharge. Results: Among 2065 patients, 1291 patients were excluded with criteria. Of the 774 patients, 519 patients (67.0%) discharge with poor outcome. Initial serum cholesterol level was significant higher in good outcome group than those in poor outcome group (163 ±47 vs. 131 ±46 mg/dL, p < 0.001). Receiver operating characteristic analyses were performed to calculate prognostic performance of cholesterol (AUC=0.692; 95% confidence interval [CI], 0.658-0.724) and with a cut-off value of the concentration of 142 mg/dL, good outcome was predicted by sensitivity of 67.5% and specificity of 62.8%. Conclusions: Surviving after cardiac arrest patient with initial serum cholesterol under 142 mg/dL is high risk of poor neurologic outcome at discharge (OR=3.44). Corresponding Author: Jaehoon Oh (ojjai@hanmail.net)

Comparison of Clinical Outcomes Between In-hospital Cardiac Arrest and Out-of-hospital Cardiac Arrest According to Location of Residence and Volume of Hospital: a Nation-wide Database Study
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Background and Objectives: There is no study about comparison of clinical outcomes between in-hospital cardiac arrest (IHCA) and out-of-hospital cardiac arrest (OHCA) according to hospital location and volume. The aim of the present study is to analyze clinical outcomes according to hospital location and volume between IHCA and OHCA, using a nation-wide database. Methods: Using the Korean National Health Insurance Service Database, we had enrolled 488,129 patients (>20 years) with claim with cardiac arrest from 2004 to 2015. The hospital-location was categorized into “Metro” (Metropolitan), “Urban” (Urban/ City), “Country” (Country/Province) groups according to the Province of South Korea. And the hospital-volume was categorized into “<300” (below 300 beds), “300-499” (between 300 and 499), “>500” (over 500 beds) group. The primary outcomes were mortality within 30 days, 6 months and 1 year according to hospital location and volume between IHCA and OHCA. Results: The total number of cardiac arrest was 488,129, of which 31.1% were in IHCA and 68.9% were in OHCA. The mortality rate only in 30 days was significantly higher in OHCA, the rate in 6 month and 1 year were significantly higher in IHCA. Among the IHCA, in “<300”, there were significantly more cardiac arrest patients than other hospitals. Otherwise, among the OHCA, in “>500”, there were significantly more cardiac arrest patients than other hospitals. The proportion of “Metro” (IHCA vs. OHCA, %: 41.36 vs. 42.29, p<0.0001), “Urban” (IHCA vs. OHCA, %: 40.89 vs. 43.05, p<0.0001) and “Country” (IHCA vs. OHCA, %: 17.75 vs. 14.66, p<0.0001) were shown. The IHCA group showed significantly higher Charlson comorbidity score. Conclusions: In this study, only short-term mortality was significantly higher in OHCA, significantly higher IHCA was related with “<300”, OHCA was related with “>500”, and in OHCA as well as IHCA, there were significantly more cardiac arrest patients in a dense populated location. (NRF-2017R1A2B1005377.)
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Optimal Depth For High Quality Chest Compression Between Obese and Normal Weight Individuals Using Computer Tomography: a Retrospective Study
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Background and Objectives: Current guidelines recommended that chest compression depth of 5-6 cm during cardiopulmonary resuscitation should be at least one-fifth of the external chest antero-posterior (AP) diameter. Accumulation of fatty tissue in the abdomen of obese patients can lengthen the external chest AP diameter and the depth of 5-6 cm might not be sufficient for obese patient. This study aim to identify the difference of optimal chest compression depth between obese and normal weight individuals using computed tomography (CT). Methods: We performed a retrospective analysis of the chest computed tomographic findings obtained between January 2010 and August 2016. We have measured several parameters on axial view being shown the maximal left ventricular diameter in two groups; 1) External AP diameter, from skin on the sternum vertically to skin on back. 2) Internal AP diameter, from undersurface on the sternum vertically to anterior longitudinal ligament on the body of vertebra. 3) Heart AP diameter, on a line of external and internal AP diameter. We also calculated the compression proportion as follow as; Proportion of the heart was being compressed by chest compression with 5 cm or 6 cm depth=[Heart AP diameter-Internal AP diameter-50 or 60 mm)]/Heart AP diameter×100. Results: The mean ± standard deviations of external, internal, heart AP diameter for obese and normal weight patients were 280.6 ±26.5 mm, 201.1 ±17.2 mm, 134.5 ±17.2 mm vs. 99.3 ±13.7 mm, and 107.2 ± 11.4 mm vs. 83.0 ±9.2 mm, respectively (all p<0.001). The compressed proportion of 50- and 60-mm depths were also significantly different between the 2 groups (21.8 ±9.6% vs. 41.4 ±10.2%, 31.2 ±10.3% vs. 53.6 ±11.2%, all p<0.001). Conclusions: Chest compression depths based on current guidelines are not sufficient for obese patients during CPR. Corresponding Author: Jaehoon Oh (ohjae7712@gmail.com)

The Probabilities of Skeletal Chest Injuries Following Cardiopulmonary Resuscitation
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Background and Objectives: Skeletal chest injuries (SCI) including rib fractures are unavoidable complications of cardiopulmonary resuscitation (CPR). This study was conducted to investigate factors related to SCI. Methods: This study was a retrospective analysis of a prospectively collected data including adult non-traumatic cardiac arrest patients who survived after resuscitation and underwent chest CT. SCI were assessed by chest CT interpretation. Variables related to resuscitation including age, gender, bystander CPR, prehospital and ED CPR duration, resuscitation outcome were collected. Multiple logistic regression analysis to seek factors related to SCI and a cubic spline was fitted to visualize the predicted SCI probability. Results: A total of 274 patients (age: 62.6 ±15, 180 males) were included. SCI was found in 185 patients (68%). Patients with SCI were older in age (64.4 ±12 vs. 54.7 ±17 years, p<0.001), received a higher frequency of prehospital CPR (78.9 vs. 66.3%, p=0.024) and had a longer total CPR (26.3 ±19.4 vs. 21.5 ±14.8 minutes, p=0.022). Multiple logistic regression analysis showed that factors associated with SCI were age and CPR duration (OR: 1.06, CI: 1.04-1.08, p<0.001 for age, OR: 1.03, CI: 1.01-1.04, p=0.006 for CPR duration). The overall all SCI probability and the SCI probability in the early phase of CPR were higher.
in patients beyond the age of 60 than in patients under age 60. **Conclusions:** SCI is determined by age and CPR duration. The SCI probability increases with a prolonged CPR duration and the overall SCI probability in patients beyond the age of 60 was higher.

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**PO_RES_01_07**

Prehospital Settings and Outcomes of Out-of-hospital Cardiac Arrest in Elderly Patients Transported to an Emergency Medical Center in Japan

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**Background and Objectives:** As the population ages in Japan, the number of elderly patients who visit emergency medical center has increased. Especially, in the critical settings like cardiac arrest, it is difficult to determine how patients should be treated. Our hospital has the only emergency medical center located in the suburb area of Tokyo where 390,000 people live with the rate of aging 27.90% in 2015. The aim is to mitigate the burden of medical care in the emergency settings. **Methods:** A single-center, retrospective observational study. Patients (aged ≥65 years) with out-of-hospital cardiac arrest (OHCA) were included. Presumed causes of trauma and drowning were excluded. The survey period was from October 1st, 2016 to September 30th, 2018. Demographic data was derived from prehospital and electronic medical records. **Results:** The total number of OHCA was 403, and 210 patients were included. Seventy percent was male. Patients who required care were 16.7%, and 1.9% had home care. Witnessed cardiac arrest and transition to cardiac arrest at prehospital care were accounted for 58.6%, and 67.1% happened at their homes, 8.1% at nursing homes for elderly, 1.4% at other medical facilities. The number of patients who had ‘do-not-attempt resuscitation’ orders was 3.3%. The 30-day mortality rate was 91.9%. **Conclusions:** In most cases, it found out that OHCA in elderly patients had poor outcomes. However, it is considered that age is not always related, because several elderly patients had full recovery after cardiac arrest. The level of care needed and past illness are important information to make clinical decision. It is essential to cooperate with regional social welfare facilities and make fulfillment of home care system. If patient has chronic disease, advance directive with the natural course may take an important role to mitigate invalid and futile treatments for patients in the critical settings.

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**PO_RES_05_01**

Outcomes of Adult Out-of-hospital Cardiac Arrests in an Urban Tertiary Hospital in Taiwan

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**Background and Objectives:** Out-of-hospital cardiac arrests (OHCA) remain a major issue which influence public health in the world. The prognosis is still various. It would be due to different measures of outcome, study sites, and populations. **Methods:** A retrospective observational cohort study of OHCA patients conducted in the emergency department of an urban tertiary hospital in Taiwan, which has an annual ED visits of 80,000 patients. Data collected from 2008-2017 adult non-trauma patients. We analyzed the survival and neurological outcome. **Results:** The average rate of ROSC was 31.1% and survival to hospital discharge was 11.2%. Favorable neurological outcome upon discharge, defined as cerebral performance category score of 1 or 2, was improved. Elder associated with poor outcome. **Conclusions:** Survival and the proportion of survivors with favorable neurological outcomes increased significantly.

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**PO_RES_05_02**

Improvisations in the Emergency Department of Mbarara Regional Referral Hospital

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**Background and Objectives:** The faculty of medicine at Mbarara University of Science and Technology (MUST) in Southwestern Uganda launched the first accredited Emergency Medicine Residency Training in Uganda in August 2017. The training has been rewarding but not without challenges, including the lack of medical supplies. This has inspired development of creative low-cost local solutions such as the use of cardboard cervical spine collars made from discarded boxes. While road traffic injuries account for about 49% of total injuries, investigations to rule out head and cervical spine injury are not readily available due to resource limitation. Therefore, collars are one of the recommended and most commonly used emergency management adjuncts for spine immobilization. Studies have showed that rigid collars are superior to soft collars in providing immobilization. To compare the performance of the improvised cardboard collars vs. rigid commercial collars in restricting neck movement. **Methods:** Experimental study involving 32 healthy volunteers; non-random sampling. Using commercial collars (LaridelTM), wooden templates were manufactured and used to make cardboard collars with staple wires. Appropriate collar size was obtained by measuring the chin to shoulder finger breadths. Using a goniometer, three doctors measured neck motions in flexion, extension, left and right rotation, left and right lateral bending with the neck free (F), with a commercial collar and cardboard collar for each subject. Data analysis was done using Microsoft EXCEL. **Results:** Cardboard collar was as effective as commercial collar in restricting all six neck motions. It performed better with motion significantly reduced to 11-28% compared to 12-34% with commercial collar (p values of difference ranging: 0.001-0.89); in the order of right rotation˃left lateral bending˃extension flexion right lateral bending left rotation. **Conclusions:** Cardboard collar was not inferior to commercial collar in neck immobilization. It could be a highly economical solution in low-resource settings.

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**PO_RES_05_03**

Activation of Rapid Response Team in Indonesia’s Top Referral Hospital: Frequencies and Hospital Mortality

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**Background and Objectives:** Cipto Mangunkusumo Hospital as the top referral hospital in Indonesia is dominated by difficult and complicated cases. To ensure optimal resuscitation care throughout the hospital, Rapid Response Team (RRT) has been implemented. This study aims to describe the frequencies and mortality rate in cases treated by RRT. **Methods:** This is a descriptive cross-sectional study. We collected data from RRT Cipto Mangunkusumo Hospital database from January 2017 to September 2018. We categorized primary diagnosis based on WHO classification of ICD 10. The inclusion criteria are the patient data that was recorded in the database. We exclude false code blue activation and missing data. We also considered patients’ do not resuscitate (DNR) status. **Results:** There were 1,625 RRT activations from 59,074 admissions during the study period. Among 21 groups of diagnosis, the largest primary diagnosis was neoplasm (27.3%), followed by diseases of the respiratory system (16.0%) and diseases of the circulatory system (14.7%). Oxygen desaturation (47.3%) was the main cause of RRT activation, with neoplasm and diseases of the respiratory system as the leading primary diagnosis. On the other hand, the diagnosis group with highest hospital mortality was diseases of the circulatory system (66/197, 33.5%). **Conclusions:** End-stage diseases including neoplasm were the leading primary diagnosis. However, diseases of circulatory were still the highest cause of mortality treated by RRT. Furthermore, oxygen desaturation, as the most frequent, is a complex problem. Consequently, RRT in Cipto Mangunkusumo Hospital as Indonesia’s top referral hospital faces unique challenges. This is an important knowledge to improve resuscitation care. Further study is needed to identify contributing factors in RRT activation and hospital mortality.

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**PO_RES_05_04**

The Effectiveness of Interprofessional Cardiopulmonary Resuscitation Training: Doctors vs. Nurses

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Background and Objectives: Doctors and nurses often face conditions where cardio-pulmonary resuscitation is needed. They need to work as a team in order to succeed delivering CPR. Doing optimal CPR also requires practical skills according to a resuscitation algorithm by American Heart Association (AHA). This study aimed to find out about the effectiveness of interprofessional CPR training in improving team dynamics and individual practical skills in doctors and nurses.

Methods: This was a cross-sectional study that involved 12 doctors and 14 nurses in interprofessional CPR training. Team dynamics and individual practical skills were observed during simulations and assessed by an anesthesiologist using checklist. The simulations were done in teams, each consisting of 2 doctors and 3 nurses. Data were collected and analyzed statistically based on their professions.

Results: In doctor group, there were significant difference in individual practical skills (p=0.002) before and after training. Meanwhile, in nurse group, there were significant difference in both team dynamics (p=0.047) and individual practical skills (p=0.001) before and after training. When comparing between the two groups after training, the result showed significant difference in individual practical skills (p<0.001) and no difference in team dynamics (p=0.111).

Conclusions: Interprofessional CPR training improved individual practical skills in doctor and nurse group, and also improved team dynamics in nurse group. Team dynamics was not different between two groups.

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PO_RES_05_06

Serum Cholesterol Level as Prognostic Factor in Post-cardiac Arrest Patients

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Background and Objectives: Low cholesterol level has been investigated as the risk factor of onset of sepsis and prognostic factor of mortality. Sepsis is complicated inflammatory process with ischemic-reperfusion injuries. Post-cardiac arrest syndrome also has global ischemic-reperfusion injury and considered as sepsis-like syndrome due to the severe inflammatory process. In previous study, oxidative syndrome also has global ischemic-reperfusion injury and considered as sepsis-like inflammatory process with ischemic-reperfusion injuries. Post-cardiac arrest syndrome during cardiac arrest is significantly associated with higher ROSC. However, other ultrasound findings associated with true and pseudo PEA, and ROSC. Methods: From May 2018 to September 2018, cases with PEA arrests in the Emergency Department of Maharaj Nakorn Chiang Mai Hospital, were included. Point-of-care ultrasound (POCUS) was performed on PEA arrest cases in sub-xiphoid view to determine heart motion during 10-second pulse checks, and on abdomen and both chest walls during resuscitation without interrupting chest compressions by trained emergency residents or emergency physicians. This study primarily aims to determine cardiac motion to compare the association of true and pseudo PEA with ROSC, and secondarily aims to compare associated sonographic findings between true and pseudo PEA.

Results: Cardiac motion was found to be significantly associated with ROSC (p=0.014). Ultrasound findings (pericardial effusion, IVC size, RV/LV ratio, lung sliding, pulmonary effusion, pulmonary oedema, abdominal free fluid, aorta characteristics, presence of DVT, and presence of foetus) were not significantly different between the two states. Conclusions: Cardiac activity detected during POCUS during cardiac arrest is significantly associated with higher ROSC. However, other ultrasound findings do not significantly differ between two states.

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PO_RES_05_05

Has the Heart Truly Stopped: ROSC and Associated Ultrasound Findings in Pseudo-PEA and PEA Arrests in the Emergency Department

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Background and Objectives: Twenty percent of cardiac arrest patients present with initial rhythm of pulse less electrical activity (PEA). Recently, studies have looked into pseudo-PEA, where cardiac motility is present, but not strong enough to generate a pulse. Few studies have proposed that absence of cardiac activity detected on ultrasound may be a predictor of poor prognostic outcome. We aim to further expand on this, and find association between other ultrasound findings associated with true and pseudo PEA, and ROSC. Methods: From May 2018 to September 2018, cases with PEA arrests in the Emergency Department of Maharaj Nakorn Chiang Mai Hospital, were included. Point-of-care ultrasound (POCUS) was performed on PEA arrest cases in sub-xiphoid view to determine heart motion during 10-second pulse checks, and on abdomen and both chest walls during resuscitation without interrupting chest compressions by trained emergency residents or emergency physicians. This study primarily aims to determine cardiac motion to compare the association of true and pseudo PEA with ROSC, and secondarily aims to compare associated sonographic findings between true and pseudo PEA.

Results: Cardiac motion was found to be significantly associated with ROSC (p=0.014). Ultrasound findings (pericardial effusion, IVC size, RV/LV ratio, lung sliding, pulmonary effusion, pulmonary oedema, abdominal free fluid, aorta characteristics, presence of DVT, and presence of foetus) were not significantly different between the two states. Conclusions: Cardiac activity detected during POCUS during cardiac arrest is significantly associated with higher ROSC. However, other ultrasound findings do not significantly differ between two states.

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PO_RES_05_06

Management of Complicated Arrhythmia: a Case Report

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Background and Objectives: Although there are criteria such as the Brugada and Vereckei utilized to differentiate Supraventricular Tachycardia (SVT) with aberrancy from Ventricular Tachycardia (VT), they can have low sensitivity in diagnosing VT and recommendations suggest treating the rhythm disturbance as VT if in doubt. The guidelines, however, fail to address management in more acute and complicated presentations. Methods: An 83-year-old hemodynamically stable man

PO_RES_05_07

The Experience of Using Informational Systems to Improve the ACLS Process Optimization in Hualien Tzu-Chi Hospital Emergency Department

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Background and Objectives: The best first-aid treatment for cardiac arrest patients is Advanced Cardiac Life Support (ACLS), and we not only hope to save lives but also leave minimal sequelae. The American Heart Association (AHA) published updated ACLS guidelines for care in 2015, emphasizing the concept of teamwork in resuscitation. However, the actual use of ACLS is not accessible due to stress and unfamiliarity with the process. Therefore, we want to use the information technology to assist the medical team to implement the ACLS process. This information system can help us to save time, labor, and to get precision. In addition to this, data analysis is more convenient, which facilitates the management and supervision of resuscitation quality. Methods: Information system developed using responsive web design (RWD) website. It can be used on a variety of devices, such as desktops, tablets or mobile phones, and can be updated simultaneously. The system requires a non-synchronous operation to be used in a wireless network environment. When the information system is in operation, the medical personnel can perform the resuscitation actions according to voice prompts, which can periodically remind staffs to check rhythm, give correct medication dose, and whether need defibrillation shock. At the same time, the entire process can be recorded instantly. After the file is uploaded, the medical records are complete at the same time. Results: The satisfaction of medical staffs reached 80.3%, the rate of return of spontaneous circulation (ROSC) of OHCA cases elevated to 45% from 15%, discharge without neurological sequelae elevated to 33% from 27.4%, after the system beginning three months. Conclusions: All hospital staff can use this system to assist in the implementation of advanced CPR correctly. It does improve the quality of resuscitation and reduce the burden on clinical and writing medical records of medical staff. Corresponding Author: Pei Fang Lai (lpD2826@gmail.com)
presented to the emergency department with acute unilateral lower leg pain and palpitations. The initial ECG showed a broad complex tachycardia suggesting SVT with aberrancy or VT. A trial of adenosine was ineffective at cardioversion and a subsequent bolus administration of amiodarone similarly failed producing intermittent hypnotic response to bolus intravenous fluids. The ECG during this period continued to be equivocal in diagnosis. The lower leg pain worsened and was demonstrating acute ischemic changes. Electrical cardioversion was being considered but a pre-intervention transesophageal echocardiogram revealed the presence of a left atrial thrombus. The need for electrical cardioversion for hemodynamic stability was balanced vs. the possibility of acute arterial embolic generation and the consequences of significant anticoagulation in a patient requiring urgent vascular assessment and possibly surgical intervention. However, the patient suddenly deteriorated to a pulseless VT rhythm necessitating electrical defibrillation regardless of his comorbid factors. Fortunately, return of spontaneous circulation (ROSC) occurred after 2 minutes of cardiopulmonary resuscitation (CPR) with reversion to normal sinus rhythm. Results: He had no neurological deficits and was transferred to the operating theatre for a femoral-femoral bypass.

Conclusions: The case illustrates that although uncommon presentation, a quick and accurate diagnoses must be borne in mind. Malignant arrhythmia is a life-threatening emergency and appropriate training on how to diagnose it is warranted.

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**PO_RES_09_02**

Elderly and Chronic Obstructive Pulmonary Disease Patients Tends to Withhold Out-of-hospital Cardiac Arrest Resuscitation Attempts in Emergency Department

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Background and Objectives: Most EMS system in Asian do not apply TOR (termination of resuscitation) in the prehospital settings. Unless obvious signs of death, previous do-not-resuscitate (DNR), or transfer refusal, most OHCA patients are transported to hospitals for advanced resuscitation attempts. However, there is no consistency consensus on when families and emergency physicians decide to withhold resuscitation and lack of sufficient reviews on which factors affect the decision-making. The main purpose of our study is to evaluate the characteristics of withholding resuscitation efforts among OHCA patients. Methods: We retrospectively analyzed patients with OHCA without pre-hospital return-of-spontaneous circulation (ROSC) who was sent to emergency department (ED) in a university-based teaching hospital between January 2014 and December 2016. Baseline characteristics, pre-hospital courses, causes of the cardiopulmonary arrest and pre-arrest comorbidities were compared. Withhold resuscitation was defined as terminated resuscitation attempts within 10 minutes upon ED arrival. Results: In 3 years, total 239 OHCA patients without pre-hospital ROSC were included, 53 (22.2%) patients withheld the resuscitation efforts in ED with mean resuscitation duration 3.5 ± 3.5 minutes. None of the patients in withhold resuscitation group survived to discharge. There was no significantly difference among bystander CPR, underlying cardiovascular disease, malignancies, chronic renal disease, nor transport by EMS between withhold and continue resuscitation groups. In multivariate logistic regression analysis, after adjusting with gender, witness collapse, initial rhythm, arrest location and underlying cerebrovascular disease, withdrawal resuscitation was independently associated with older age, gender (adjusted odds ratio = 1.04, 95% CI = [1.01-1.06], p = 0.010), and pre-arrest chronic obstructive pulmonary disease (COPD) (adjusted odds ratio = 6.64, 95% CI = [2.30-18.04], p < 0.001). All COPD patients had non-shockable rhythm upon hospital arrival.

Conclusions: In our cohort, elderly and pre-arrest chronic obstructive pulmonary disease were two independent predictors of withdrawal resuscitation attempt in OHCA patients upon hospital arrival. The decision-making is multi-factorial, and further study among respiratory disease population is warranted.

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**PO_RES_09_04**

Timely Accessibility of Critical Resuscitation Supplies at Kigali University Teaching Hospital (CHUK)

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Background and Objectives: Preparedness for the management of critically ill patients requires trained staff and adequate supplies. Limited research exists on the impact of critical supply shortages or assessment of why and when supplies are lacking at the LMIC emergency departments initiating emergency medicine like CHUK. Methods: This is a prospective 3-month observational single-centered study done at a tertiary level hospital in Kigali Rwanda from October to December 2018. We documented the usage of different supplies from a backup stock, which was used when the hospital could not provide the desired item. We recorded the supplies used, severity of the patient’s illness, and when and why the supplies were used. Results: The items most commonly lacking that were identified during the study included atropine, ketamine, calcium gluconate, diazepam, mannitol, potassium chloride, povidone, urine pregnancy and urine dipstick. The reasons for lacking supplies included emergency department out of stocks (28%), laboratory accessibility (27.6%), hospital out of stocks (19.9%), inaccessibility of supplies (19.4%), lack of ability to pay (3%) and not on hospital formulary (2%).

The backup supplies were accessed most frequently between 12:00 and 14:00, regardless of the day of the week. Conclusions: This study has characterized gaps in the continuous availability of emergency department supplies through provision of back up supplies and monitoring of their utilization patterns. These data will help strengthen the supply process ensuring uninterrupted access to critical supplies. Future studies on the patient’s outcomes and longer period of study is recommended.

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**PO_RES_09_03**

Outcome and Characteristics of Out-of-hospital Cardiac Arrest Cases with Bystander Automated External Defibrillators Applied From 2010-2016 in Singapore

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Background and Objectives: Prompt recognition of cardiac arrest and initiation of cardiopulmonary resuscitation (CPR) and defibrillation is necessary to obtain good outcomes from out-of-hospital cardiac arrest (OHCA). There have been extensive community efforts to improve bystander CPR and use of Automated External Defibrillator (AED) over the past few years. This aim of this study is to determine the outcome and characteristics of OHCA with bystander AED applied in Singapore. Methods: All local EMS-attended OHCA patients who received bystander AED in the Pan-Asian Resuscitation Outcomes Study (PAROS) registry between Apr 2010- Sep 2016 were analysed. Results: Over this 6.5 year period, there were 349 cases of OHCA with bystander AED. The proportion of males was 86.2% compared to 13.8% for females. The mean age was 58.0 years (range 4-94 years old). 63.5% of OHCA cases with bystander AED were between 17-64 years old. 83.1% of cases happened in public area and 9.5% in nursing homes. The first CPR was initiated by healthcare providers in 61.5% of the cases, and 36.8% by bystanders. 3 cases (0.9%) did not receive bystander CPR. There were 51 survivors (14.6%), with 70.6% CPC 1 and 15.7% CPC 2. The bystander AED rate has also steadily increased from 1.94% in 2010 to 4.24% in 2016. Conclusions: Only 13.8% of females received bystander AED, as compared to previous local PAROS data by Ong et al that had 34.3%. Moreover, 83.1% of cases happened in public area, so rescuers may be less inclined to use AED on women in public areas in view of modesty issues. Most survivors in this group ended up with CPC 1 and 2 (86.3%), way higher than 1.7% in the overall OHCA cohort. As such, as public access defibrillators become more common in Singapore, it is important to concentrate on community training to improve the bystander CPR rate.

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**PO_RES_09_05**

Prediction of Poor Prognosis Using the Peak Systolic Velocity and Early Diastolic Velocity of the Central Retinal Artery in Patients with Post-cardiac Arrest Syndrome
Correlation Between Serum Levels of Lactate Dehydrogenase and Neurological Outcomes in Patients Who Undergo Target Temperature Management After Cardiac Arrest

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Background and Objectives: The optimal time to measure serum lactate dehydrogenase concentration (SLC) to predict prognosis in cardiac arrest (CA) survivors has not been elucidated. We aimed to determine the relationships between SLC at 48 hours and neurological outcomes in CA survivors.

Methods: We conducted a retrospective study examining patients with CA who were treated with target temperature management (TTM). SLC at 48 hours was measured at 24-hours intervals after return of spontaneous circulation (ROSC). SLC at ROSC and 24-, 48-, and 72-hour outcomes were the relationships between each time interval SLC and neurological outcome 3 months post-CA.

Results: A total of 256 CA patients with ROSC were included, and 31 patients (42%) experienced a good neurological outcome. At 24, 48, and 72 hours, there was a significant difference between good and poor outcome groups (p < 0.001), except at ROSC (p = 0.056). The area under the receiver operating curve (AUC) at ROSC was 0.631 (95% confidence interval [CI], 0.502–0.761). The AUC at 48 hours (0.830; 95% CI, 0.736–0.924) was higher than that at 24 and 72 hours (0.786; 95% CI, 0.681–0.892 and 0.821; 95% CI, 0.724–0.919). Conclusions: A higher SLC was strongly associated with and seemed predictive of poor neurological outcomes. Further studies are needed to confirm these results.

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programs have mandatory toxicology rotation. In Taiwan, there are forty-one among one hundred and sixty-seven ACGME-approved-EM residency programs.

**Methods:**
- Simulation-based education was conducted in the medical center-based simulation center, Mackay Memorial Hospital. The participants are equally divided to control and intervention groups after stratification by training year and pre-curriculum written grade. The lecture based training group undergo 1.5 hours and 3 topics (snake bite, pesticide and plants poisoning) toxicology lecture. And the intervention group receive simulation-based training (snake bite, pesticide and plants poisoning) testing.
- Results: The residents of simulation group have better performance on overall Modified Oxford Non-Technical Skills scale and post-curriculum written score. They also have higher confident level in emergency toxicology management and course efficacy.

**Conclusions:** Simulation could offer a safe and realistic environment for medical toxicology education. The residents participating in simulation education had better performance and self-confidence level in managing poisoned patients.

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**Neuroleptic Malignant Syndrome Precipitated by Sepsis in a Patient on Mirtazapine—Case Report and Literature Review**

**Corresponding Author:** Choon Chiau, Chin Shiah Lim, Kenneth Tan

**Methods:**
- **Background and Objectives:** Neuroleptic malignant syndrome (NMS) is a neurologic emergency linked with the use of neuroleptic agents and presents with altered mental status, rigidity, fever and dysautonomia. Although rare, mirtazapine use is associated with NMS. We report an unusual case of NMS secondary to mirtazapine, precipitated by sepsis, presenting to our Emergency Department (ED).
- **Methods:** A 67-year old lady attended our emergency department with pyrexia and altered mental status. She was taking mirtazapine and alprazolam.
- **Results:** Despite aggressive therapy for septic shock, she became increasingly rigid with lead-pipe rigidity and clonus of all limbs.
- **Conclusions:** There was a rapid onset of pyrexia and confusion developing over two hours. On arrival to ED, her vital signs were temperature 40.7°C, pulse rate 150/min and blood pressure of 60/40. She was found to be unusually rigid, with lead-pipe rigidity and clonus of all limbs.

**Corresponding Author:** Joanne Chua
ISJOANNEXUH.png

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**Adverse Reaction of IV N-acetylcysteine Therapy For Non-toxic Paracetamol Overdose: a Case-Control Study**

**Corresponding Author:** Parinyada Fungthongcharoen
ISPARIN.png

**Methods:**
- **Background and Objectives:** Intravenous (IV) N-acetylcysteine (NAC) has become the treatment of choice for paracetamol overdose. In Bhumibol Adulyadej Hospital, the decision to treat patients with IV NAC depends on history of paracetamol ingestion due to the paracetamol level not available in 8 hours. This study determines the incidence of adverse reactions association between patients with serum paracetamol level below 150 mg/L and adverse reaction after IV NAC administration.
- **Methods:** Retrospective medical record review included all patients initiated on the 21-hour IV NAC protocol for paracetamol poisoning in Bhumibol Adulyadej hospital between January 2008 and December 2017. **Results:** There were 320 patients, adverse reactions occurred in 107 patients (33.4%). Comparatively results between patients who had adverse reactions occurred with serum paracetamol level at 4 hours below 150 mg/L and patients who had no adverse reactions occurred with serum paracetamol level at 4 hours above 150 mg/L had significantly different (p-value=0.001, Sensitivity 90.7%, Specificity 26.8%, Area under curve 0.587 (95% CI 0.546-0.626), Odds ratio 3.54 (95% CI 1.75–7.18).
- **Conclusions:** Adverse reactions after IV NAC administration occurred more commonly in patients with serum paracetamol level below 150 mg/L (p-value=0.001).

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**High Anion Gap Metabolic Acidosis After Sodium Silicate Ingestion**

**Corresponding Author:** Hyun Ho Jeong, Jung Taek Park, Kyoung Ho Choi

**Methods:** Sodium silicate is, an alkaline caustic agent, have been reported for the corrosive injury of digestive tracts. And also, it has been reported to show fatal acute renal failure, which hemodialysis had been provided. Acute kidney injury seems to be closely related with the severity of sodium silicate intoxications. This case describes a patient with high anion gap metabolic acidosis after ingestion of sodium silicate.

**Methods:** A 47-year-old male, 55 kg, visited hospital complained with nausea 30 minutes after ingesting about 150 mL of aqueous solution (60% sodium silicate). 10 hours after exposure, his vital signs were stable, but heart rate was increased to 115 times. 14 hours after exposure, he showed blood pressure 130/82, arterial blood gas analysis showed pH 7.305, bicarbonate 14.7 mmol/L, pCO2 30.2 mmHg and anion gap 26.3. Continuous hourly urine output monitoring and sufficient hydration using the alkalinization flu.
Usefulness of Predictors For Hepatotoxicity in Acetaminophen Poisoning Patient
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Background and Objectives: The purpose of this study was to determine whether hepatotoxicity could be predicted early using biochemical markers in patients with acetaminophen (AAP) poisoning and to assess the usefulness of predictive factors for acute liver injury or hepatotoxicity.

Methods: This study was a retrospective observational study using medical records review. The participants were patients who were admitted to the emergency department (ED) with AAP overdose at two hospitals for 10 years. Demographic data, age, time from ingestion to visit, initial AAP level, initial hepatic aminotransferases, initial prothrombin time were recorded. Acute liver injury defined as a peak serum ALT > 50 U/L or double the admission value, and hepatotoxicity was defined as a peak ALT > 1,000 U/L. Receiver operating characteristic curve analysis were performed to compare the prognostic performance among variables. Results: A total of 97 patients were admitted to the ED, of whom 26 had acute liver injury and 6 had hepatotoxicity. Acute liver injury associated with the time interval after taking the drug, and the hepatotoxicity associated with the initial PT, ALT level. The scoring system proposed by the authors has a significant effect on predicting both acute liver injury and hepatotoxicity. Conclusions: To predict the prognosis of AAP poisoning patients, the time interval after taking AAP was important, and initial prothrombin time and ALT level was found to be useful tests. Also a scoring system combining variables may be useful.

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Metabolic Acidosis and Caustic Injury: a Result of Lacquer Thinner Poisoning
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Background and Objectives: This is a rare case of non-accidental ingestion of lacquer thinner by a 24 year old male who presented with high anion gap metabolic acidosis and chemical burn to the mucosa. He was managed as a case of methanol toxicity and caustic ingestion, a medical emergency requiring immediate treatment. Lacquer thinner, one of the most common household and workplace chemical used in thinning paint is known to contain a myriad of hydrocarbons. Current data shows that toluene, its aromatic hydrocarbon component, is responsible for the toxicity. This case revealed that lacquer thinners contain poisonous substances other than toluene such as methanol, acetic acid and methyl ethyl ketone. Methods: A 24 year old male was brought to the Emergency Department due to changes in behaviour and abdominal pain after deliberate ingestion of lacquer thinner as a suicide attempt. He developed epigastric pain and vomited a cup of blood. He was taken to our institution with stable vital signs, GCS 15 and no cardiorespiratory distress. He was clinically inebriated despite no co-ingestion. Physical exam showed whitish membranes on hard palate and posterior pharyngeal wall and direct tenderness on epigastric area suggesting alcohol intoxication and caustic injury. Significant laboratory findings included High Anion Gap Metabolic Acidosis. The patient was given Folic Acid as an antidote to methanol. Immediate endoscopy showed grade 3A mucosal injury, circumferentially sloughed off mucosa of the esophagus and duodenum. The patient ultimately underwent exploratory laparotomy and tube jejunostomy insertion as definitive management. Results: Conclusions: Household and workplace products may contain various poisons that are capable of causing serious physiologic morbidity. In this case, high clinical suspicion based on careful history and physical examination was a critical factor in the diagnosis and timely intervention.

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I’m No “Fei Mao” (Leaking Windpipe-Unforgettable Cycling Experience)
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Background and Objectives: Blunt neck trauma patients may come with various presentations and potentially life-threatening ones in rare circumstances. Pneumomediastinum may develop in up to 10% of patients who have sustained blunt neck or thoracic trauma which may be a significant cause of morbidity and mortality. Therefore, the establishment of a well-conceived multidisciplinary plan prior to the traumatic event is critical for improving patient outcome. Methods: A 55 year-old Chinese gentleman with complaint of pain over the anterior neck and progressive generalized swelling over the face, neck, chest, back and upper limbs. He reported to have accidentally fallen from his bicycle with his anterior upper neck hitting the handlebars on impact. He had hoarseness of voice. The anterior aspect of his neck was tender with ecchymosis, and there was presence of peribital and facial swelling with crepitus extending throughout the neck and anterior chest wall, upper back and both upper limbs. Case was referred to Anaesthetist and ORL teams, planned for elective intubation in the operation theatre (OT). Results: The plain computed tomography (CT) scan of the chest demonstrated bilateral pleural effusions and extensive surgical emphysema secondary to posterior tracheal wall injury from the level of lower border of C6 until the upper border of C7 with presence of massive pneumomediastinum. Patient was intubated in the OT using glide scope without complication and admitted to ICU where bilateral chest tubes were inserted. Patient was stable throughout stay in the hospital and he was discharged home a few days later. Conclusions: Bicycle riding is a popular form of recreation among persons of all ages. It requires a multidisciplinary approach involving the Emergency Department, ORL and Anaesthetist team. Deci-
Early Intervention of Definitive Airway in Trauma Secondary to Maxillofacial Injury

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Background and Objectives: In trauma cases involving maxillofacial injury, airway compromise is a potential lethal injury that should be anticipated as it could lead to grave consequences. Methods: A 30 years old Myanmar gentleman, brought into Emergency Department by Ambulance after allegedly assaulted by 2 other man armed with knife. He sustained multiple laceration wound over face, shoulder and leg due to unsure exact mechanism of injury. Upon presentation, patient was alert with good breathing effort. Vital sign was stable. During primary survey, noted that patient had deep laceration wound over left cheek, thu and thu, measuring 6cm with oozing of blood intraoral, jaw was deviated to the right. Bleeding from the oral cavity continue without knowing the source of bleeder. Continuous compression was done but still unable to stop the bleed. Subsequently patient had gurgling sound and developed stridor. Intubation was then command in view of airway compromised. Patient was referred to oral surgery team for further evaluation and intervention. Results: Maxillofacial injuries with airway obstruction are rarely encountered in our practice of Emergency Medicine but deemed to have fatal consequences if not addressed promptly and appropriately. More than 50% of these injuries will have multisystem trauma that requires multidisciplinary involvement. Maxillofacial injuries are very prone to massive hemorrhages. Massive facial hemorrhages may lead to airway obstruction due to difficulties in hemorrhage control. According to Advanced trauma life support (ATLS) recommendation for patient who sustained life-threatening injuries, managing airway is the first priority. If in doubt, a lower threshold to establish a definitive airway early rather then to wait and endure the complication of a maxillofacial injury. In maxillofacial injury, it is always a difficult airway and do ensure that help is available. Conclusions: Early airway intervention is crucial in managing airway compromise secondary to maxillofacial injury for better prognosis and recovery.

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Comparison of Serious Injury Between Elderly and Non-elderly Passenger in Frontal Motor Vehicle Collisions

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Background and Objectives: This study aimed to compare the injury severity between elderly occupants and non-elderly occupants in frontal motor vehicle collisions (FMVCs) and to investigate the protective effect of safety devices on serious injuries. Methods: Korea In-Depth Accident Study (KIDAS) has collected vehicular and demographic data on occupants who visited three emergency medical centers via ambulances involved in FMVCs for calendar years 2011–2017. Injured occupants were categorized into non-elderly (ages<54) and elderly (aged older than 55 years). Primary and secondary endpoints were serious injury in each part (Maximum Abbreviated Injury Score 3+) and protective effect of safety devices on serious injuries. Crush extent (CE) was classified into 1-2, 3-4, 5-6, and 7-9 according to the crash severity. We calculated adjusted odds ratios (AORs) of safety devices and CE for study outcomes and developed an interaction model in each collision direction using multivariate logistic regression analysis. Results: Of total 1,015 occupants who were injured in FMVCs, 307 (30.2%) were elderly occupants. In univariate analysis, elderly occupants were more likely to have serious head, chest, and spine injuries (p<0.05). Elderly occupants were more likely to be seriously injured 2.8 times in head (AORs 2.863, 95% confidence interval (CI) 1.623-5.050), 2.7 times in chest (AORs 2.686 95% CI 1.881-3.836), and 2.0 times in spine (OR 2.039, 95% CI 1.133-3.669). In interaction analysis, the airbag had a 42% prevention effect of serious chest injury at CE 3-4 (OR 0.582, 95% CI 0.35-0.966). Conclusions: We observed that elderly occupants had more serious head, chest, and spine injury in FMVCs than non-elderly occupants and airbag had the protective effects on serious chest injury at a medium velocity range.

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Impact of Helmet Use on Severity of Head Trauma Admitted to the Emergency Department of Preah Kosaamak Hospital in First Half of 2018

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Background and Objectives: Cambodia is a developing country which is experiencing rapid urbanization and motorization. Unfortunately without a corresponding increase in helmet usage, road traffic accidents have become one of the leading causes of mortality and morbidity here. Traumatic brain injuries secondary to road traffic accidents are now a major public health issue. This analysis was conducted to quantify the impact of the use of helmets on the severity of injury following road traffic accidents in Cambodia in our hospital. Methods: The medical records of 365 motorcyclists who were admitted to the Preah Kosaamak Hospital for the first half of 2018 were retrospectively analyzed for severity. Severity of the head injuries was assessed by indicators such as symptoms, loss of consciousness, pupillary size, GCS, and head CT imaging. Results: Among the 365 patients admitted, 290 (79.5%) did not wear helmets. Of those who did, 57 (15.6%) wore an open face type, 15 (4.1%) half-covered type and 3 (0.8%) full face type. The most common injuries at presentation were contusions (38.0%), epidural hematomas (26.1%), subdural hematomas (17.9%), subarachnoid hemorrhages (9.4%), skull fractures (12.4%), and facial fractures (14.5%). Moderate-to-severe loss of consciousness and GCS lower than 8 was present in 36.3% of patients. Not wearing a helmet was associated with an odds ratio of 2.20 for presenting with moderate to severe loss of consciousness compared to helmeted patients. Conclusions: Regardless of type, wearing a helmet provides significant protection against severe head trauma for motorcyclists. Reinforcement of the law and motivating citizens on the proper use of helmets can reduce morbidity, mortality and attendant poverty.
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**Long-term Survival of Adult Patients After Moderate and Severe Trauma in Hong Kong: 7 Year Prospective Multicenter Study**

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**Background and Objectives:** Advances in the acute care for trauma patients improved the short-term mortality significantly and shifted more focus to post-discharge rehabilitation. Pattern of long-term mortality may highlight opportunities for intervention to reduce the risk of late deaths. The current study aims to investigate the annual mortality of patients sustaining moderate to major trauma in the 7 years post-injury.

**Methods:** This was a multicenter, prospective cohort study of patients entered into the trauma registry of the three regional trauma centres in Hong Kong. Patients were included if they were aged ≥18 and with an ISS ≥9.

Standardized mortality ratio (SMR) was used to compare the annual mortality rate of the injured cohort with a population-based matched cohort. Results: 400 patients were recruited from January to September 2010 (mean age 53.3±69.5% male). In the 7 years post-injury, annual mortality rate (AMR) of the trauma cohort was consistently higher than the expected mortality rate from a sex- and age-matched general population (p-value<0.05) although for the 4th and 6th years the differences were not statistically significant. AMR was 15.5% (95% CI:12.1%-19.4%) in the first year with a SMR of 9.2 (95% CI:7.1-11.7). Among those died in the first year, 58.1% (95% CI:44.9%-70.5%) occurred in the first month, 30.6% (95% CI:19.6%-43.7%) occurred between 1st and 6th month and 11.3% (95% CI:4.5%-21.9%) in the second half of the year. AMR dropped to 3.3% (95% CI:1.6-5.8%) and 3.1% (95% CI:1.5-5.6%) in the 2nd and 3rd year, ranged from 2%-2.9% in 4-6 years and rebounded to 3.4% (95% CI:1.7-6.2%) in the 7th year. SMR from 2-7 years were above 2 (2.1-2.6) except for the 4th and 6th years when SMR were 1.6.

**Conclusions:** For patient suffered moderate to major trauma, although most of the deaths were recorded in the first year post-injury, annual mortality rate in the subsequent 6 years remained high and twice that of the general population.

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**Early Pre-hospital Intervention in Crush Syndrome: a Case Report**

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**Background and Objectives:** Road traffic accident (RTA) with entrapment is not uncommon. Despite successful extrication, patient may develop severe injuries resulted the crush injury of the limbs. The prolonged ischemic episode can result to reperfusion injuries and multi organ failure. It is imperative to maintain adequate muscle perfusion especially during pre-hospital environment to reduce the risk and complications such as hyperkalaemia, renal injury, arrhythmias and death.

**Methods:** A 28-year-old lorry driver had arao traffic accident resulted in his lorry to overturned. Although he was conscious, he was trapped under a landslide area covering him up to his umbilicus. Prehospital care (PHC) of the nearest health facility was informed immediately. Later, the medical emergency call centre (MECC) Hospital Ampang was alerted due to the complicated entrapment. The extrication process took nearly 8 hours with the patient not receiving any prehospital treatment. The author reports a clinical case of scalp laceration where the use of oxidized regenerated cellulose should be removed once the hemostasis obtained, especially crushing injury.

**Results:** Crush syndrome is a life-threatening condition which occurs following a direct compression resulting in the destruction of the muscles. The muscle eventually developed ischemia and non-viable. This subsequently lead to rhabdomyolysis, multiple organ failure, shock and finally death. In a prolonged extrication, treatment must be initiated as early as possible to minimise the risk developing crush syndrome and reperfusion injury. Studies has shown an excess fluid administration up to 12 litres is required started at site to reduce the risk of crush syndrome complications. One study found that all patients with crush injury receiving less than 6 litres during the pre-hospital care had poor prognosis.

**Conclusions:** A timely fluid resuscitation and pre-hospital intervention is essential to minimise crush syndrome and improve the patient’s prognosis and recovery.

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**Prevention of Traumatic Head Injury of Seat Belt in Case of Elderly Occupant Accident**

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**Background and Objectives:** Elderly occupants are more fragile than non-elderly occupants in motor vehicle collisions (MVCs). We sought to assess whether the preventive effect of safety belt on traumatic brain injury (TBI) from MVCs differ according to occupants’ age.

**Methods:** This study was a retrospective observational study. The study evaluated crash data from 2011 to 2016 obtained from the Emergency Department-based Injury In-depth Surveillance (EDISIS) registry. Injured occupants were categorized by age into young adults (ages 18-35 years, n=15,032), middle-aged adults (ages 36-55 years, n=34,507), and older adults (aged older than 55 years, n=21,895). Primary endpoint was TBI, secondary endpoint was ICU admission, and tertiary endpoint was mortality. Multivariate logistic regression analysis was performed, and adjusted odds ratios (AORs) of subgroups were calculated for study outcomes adjusted for any potential confounders.

**Results:** Among a total 91,434 patients, 61,205 (66.9%) used seat belts at the time of crashes. In a model adjusted for potential confounders, compared with the unbelted group, the belted group was less likely to have TBI (AORs=0.62, 95% confidence interval (CI)=0.51-0.77). In the comparison of AOR of subgroups for TBI, OR reduction was the highest in the young adults (AOR=0.389, 95% CI, 0.321-0.471), followed by middle-aged adults (AOR=0.395, 95% CI, 0.334-0.467) and older adults (AOR=0.488, 95% CI, 0.423-0.562). In addition, seat belt use had the effect to prevent ICU admission and mortality in all subgroups (AOR=0.59, 95% CI, 0.53-0.64 and AOR=0.18, 95% CI, 0.16-0.22, respectively).

**Conclusions:** The protective effects of seat belt on TBI, ICU admission, and mortality from motor vehicle collisions decreased with age.

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**A Clinical Case of Full-thickness Skin Necrosis in Scalp Laceration After Oxidized Regenerated Cellulose Application (Case Report)**

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**Background and Objectives:** The cellulose hemostatic compresses are usually using in surgery. The author reports a clinical case of scalp laceration where the use of hemostatic compresses, left under a subcutaneous tissue for bleeding control in scalp laceration after crushing injury that led to full-thickness skin necrosis. We concluded that the full-thickness skin necrosis is affected both to the chemical action of the soluble component of oxidized regenerated cellulose and viability of wound basement. Consequently, the oxidized regenerated cellulose should be removed once the hemostasis obtained, especially crushing injury.

**Methods:** 63 years old women visit the ED with scalp laceration Before skin closure, and for the purpose of adding the means of preventing the hematoma, hemostatic compresses, 3 sheets of oxidized regenerated cellulose were applied to the wound, above the peristomeum to subcutaneous layer.

**Results:** Full thickness necrosis, the epidermis to peristomial layer, was seen in applied region. **Conclusions:** The oxidized regenerated cellulose should be removed once the hemostasis obtained, especially crushing injury.

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**Preventive Effect of Seat Belt on Mortality According to Age in Road Traffic Injuries**

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Background and Objectives: Road traffic injury (RTI) is the top five causes of all-cause mortality globally and the second leading cause of death among youth in Korea. The seat belt is highly effective in preventing injuries but the protective effect according to age is not well known. The aim of this study is to evaluate the preventive effect of seat belt use according to the age on mortality in road traffic injury. Methods: This is the cross-sectional observational study. We identified adult road traffic injury patient from the Emergency Department based Injury Surveillance (EDISS) database between January 2007 and December 2017. We exclude the patients who were the passenger and unknown information of seatbelt use and outcomes. The primary outcome was in-hospital mortality. Multivariable logistic regression was used and adjusted odds ratios (AORs) with 95% confidence intervals (95% CIs) were calculated. Interaction model with an interaction term was used between seat belt use and age as the final multivariable logistic regression model. Results: Among 286,310 eligible RTI patients, 267,070 patients were analyzed after excluding passenger and unknown information of outcomes. 116,461 (43.6%) patients were wearing a seat belt. The mortality was 0.48% in seat belt group and 2.17% in no seat belt group. AORs (95% CIs) of seat belt use were 4.15 (3.79-4.54) for mortality. In the interaction model, AORs of patients older than 65 years old was 4.39 and those of younger patients were 4.08. Conclusions: Seat belt in road traffic injury reduced mortality. The preventive effect of the seat belt on mortality was significant in old age. Public health efforts to increase seat belt use are needed to reduce health burden especially in elderly. Corresponding Author: Yu Jin KIM (myda02@gmail.com)

PO_TRA_08_04
Validity of the Korean Triage and Acuity Scale For 30-day Mortality From Severe Trauma
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Background and Objectives: Since January 2016, emergency medical centers in South Korea have used the Korean Triage and Acuity Scale (KTAS) as the initial triage tool for all patients, including trauma patients, who visited the emergency department (ED). This present study aimed to assess the validity of the KTAS for predicting 30-day mortality due to severe trauma. Methods: This retrospective study included patients with severe trauma (injury severity score ≥16) from January 2016 to December 2017. Using KTAS, all patients were triaged as levels 1, 2, 3, and 4 by triage nurses. The primary outcome was 30-day mortality, and the secondary outcome was disposition at the ED. Disposition at the ED included admission to the general ward, intensive care unit, or operation room or death in the ED. Results: Of the 827 included patients, 30-day mortality was observed in 14.9% (n=125) of patients. Mortality was observed in 52.5% (n=42), 15.5% (n=69), 4.1% (n=12), and 0.0% (n=0) of patients in levels 1, 2, 3, and 4, respectively. The Cox proportional hazard regression analysis showed that compared to level 3, level 1 (hazard ratio [HR], 4.868; 95% confidence interval [CI], 2.341–10.119) and level 2 (HR, 2.070; 95% CI, 1.083–3.956) were independently associated with 30-day mortality. Patients with lower KTAS levels were more likely to be admitted to the operation room and were more likely to die in the ED. Conclusions: Lower KTAS levels were associated with higher 30-day mortality due to severe trauma. KTAS shows adequate validity for predicting 30-day mortality from severe trauma.
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PO_TRA_08_05
Dog-bite Injuries in Korea and Risk Factors For Significant Dog-bite Injuries: a 6-year Cross-sectional Study
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Background and Objectives: An accurate understanding of the current status of dog-bite injuries in Korea is essential for establishing preventive strategies. There have been no national reports about dog-bite injuries in Korea. This study investigated dog-bite injuries in Korea that were registered in the nationwide injury surveillance database and analysed the risk factors for significant dog-bite injury. Methods: A multicentre cross-sectional study was conducted using the emergency department (ED)-based Injury In-depth Surveillance (EDISS) registry in Korea between 2011 and 2016. We defined significant injury as death, admission, surgery, or fracture or amputation. A multivariable logistic regression model was used to obtain the adjusted odds ratios (aORs) for the factors associated with significant dog-bite injuries. Results: Among 1,537,617 injured patients, 9,966 (6.5 per 1,000 injured patients) presented to the ED for dog-bite injuries (5.6 in 2011 to 7.6 in 2016, p for trend<0.001), and 489 (4.9%) were significant injuries. In the age-specific analysis, there were increasing trends only among teenagers (12–18 years) and adults (>18 years). Being elderly (>60 years) (aOR: 2.70, 95% CI: 2.15–3.39), having injuries to multiple anatomic sites (aOR: 4.37, 95% CI: 2.96–6.45), being bitten outdoors (aOR: 2.71, 95% CI: 2.20–3.34), and being bitten by a relative’s dog (aOR: 2.37, 95% CI: 1.09–5.17) were strongly associated with significant dog-bite injury. Conclusions: Dog-bite injuries are increasing in Korea, especially in teenagers and adults. A relative’s or neighbour’s dog may be more dangerous than a stranger’s dog. Preventive strategies are needed to prevent dog-bite injuries in adults and children.
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PO_TRA_08_06
Health Inequality Between Foreign and Native Injury Patients Visiting the Emergency Department: a Nationwide Study in South Korea
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Background and Objectives: Foreign patients more likely to receive inappropriate treatment in the emergency department compared to natives. This study aimed to investigate whether there is a health inequality between foreigners and natives who visited the emergency department with injury and to examine its causes. Methods: We analyzed clinical data from the National Emergency Department Information System (NEDIS) database associated with patients of all age groups visiting the emergency department from 2013 to 2015. We analyzed mortality, intensive care unit admission, emergency operation, severity, area, and transfer ratio. Results: A total of 4,464,603 cases of injured patients were included, of whom 67,683 were foreign. Injury cases per 100,000 population per year were 2,960.5 for native and 1,659.8 for foreign patients. Foreigners were more likely to have no insurance (3.1% vs. 32.0%, p<0.001). In rural areas, there were more injuries among foreigners (70.6% vs. 77.2%, p<0.001). Serious outcomes (intensive care unit admission, emergency operation, or death) were more frequent among foreigners. In rural areas, the difference between serious outcomes for foreigners compared to natives was greater (3.7% for natives vs. 5.0% for foreigners, p<0.001). The adjusted odds ratio (OR) for serious outcomes for foreign nationals was 1.412 (95% CI, 1.336-1.492), and that for lack of insurance was 1.354 (95% CI, 1.314-1.394). Conclusions: Injured foreigners might more frequently suffer serious outcomes, and the health inequality was greater in rural than in urban areas. Foreign nationality itself and lack of insurance could adversely affect medical outcomes.
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PO_TRA_08_07
Identification of Legitimate and Questionable Trauma Journals and Assessment of the Applicability of Criteria to Distinguish Them
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Background and Objectives: The sudden increase of questionable or predatory journals in the last few years has raised concerns in the medical literature. The aims of this study were to identify potentially legitimate and questionable trauma journals and to assess the applicability of criteria previously proposed to distinguish them. Methods: A comprehensive search strategy was developed to identify journals using keywords and controlled vocabulary. Presumed legitimate journals were identified using nine databases (Directory of Open Access Journals, PubMed, Web of Science, etc.). Presumed questionable journals were identified using Beall’s lists, emails, Google Search/Scholar. Scientific active English journals whose titles contained the words injury or trauma were eligible. Two reviewers independently
selected journals and extracted information from their websites. Criteria to differentiate journals status were based on two lists proposed by Shamsaei et al. (2017; salient characteristics) and Wicherts (2016; transparency of peer review’s items) and treated as dichotomous variables. Applicability of criteria to distinguish journal status was assessed using Fisher’s exact test. Results: Following duplicate removal, 51 potentially legitimate and 29 potentially questionable active English journals were included. Among 13 salient characteristics, seven were found to distinguish potentially legitimate from potentially questionable trauma journals: the presence of fuzzy images or spelling and grammar errors on the website, homepages targeting authors, request to submit manuscripts by email, the absence of a retraction policy, promise of rapid publication and copyright claims. However, only 3/14 items were associated with journal status: journal’s website highlights issues of publication ethics, the journal has clear guidelines concerning sharing and availability of research data, and journal allows authors to indicate names of (non-)identified reviewers. Conclusions: Among 27 criteria, 10 were found to determine trauma journals status related to their scientific legitimacy. Though no single criteria is foolproof, these criteria may be helpful to authors, readers, and reviewers when evaluating journals.

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PO_TRA_09_01
Decreasing the Hazard of Unnecessary CT Scan For Minor Head Injury in Pediatric Age Group in Hamad General Hospital, Qatar
Amr Elmoheen, Waleed Salem, Jalal Elessawi, Stephen Thomas

Background and Objectives: The aim of this project is to achieve a sustained compliance with Internationally acceptable standards for undertaking CT scanning of the brain for pediatric minor head trauma at Hamad General Hospital (HGH) Emergency Department (ED). Whilst CT scanning carries an important role in the identification of clinically significant intracranial injuries, there are associated risk of radiation. Our initial audit of clinical notes and survey of EM physicians revealed a rate of 45% CT scans for pediatric minor head injuries with around half of request not indicated. In 36% there were issues with documentation. Methods: We conducted staff education through weekly program of Continuing Medical Education for EM specialists, EM residents and fellows, prominent display and availability of a ready reference handout of the International clinical decision rules (eg, NICE guidelines, PECARN) in all clinical areas within the ED, encourage proper documentation for all head injury cases to meet JCI standards of documentation, identify documentation for this particular clinical presentation as a key quality indicator for future practice, and formulate a revised pediatric head injury guideline based on the international clinical decision rules (eg, NICE guidelines, PECARN) for CT scanning of pediatric head injuries. Results: We found that there is decreasing rate of CT scans for pediatric minor head injuries at the rate of 22% achieving a reduction by more than 30%. There was also a demonstrable improvement in the documentation by more than 30% (Deficient documentation of the major indication of CT head decreased by a rate of 23%). The overall reduction of and decreasing the percentage of un-indicated CT head by around 30%. Conclusions: Managing minor head injury in pediatric age group becomes safer by increasing the physician awareness and easy their access to the best available evidence based guidelines.

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PO_MED_04_01
A Systematic Review Comparing the Diagnostic Characteristics of Computed Tomography Pulmonary Angiography and Ventilation-Perfusion Scan (V/Q Scan) in Pregnant Patients with Pulmonary Embolism
M.Yassim Mitwalli, Sameer A. Pathan, Mahmoud Fawzy Eltawany

Background and Objectives: Diagnostic imaging with either Ventilation-Perfusion Scan (V/Q scan) or Computed Tomography Pulmonary Angiography (CTPA) remains the mainstay of evidence-based diagnostic management of suspected PE in pregnancy. This dilemma arises from deciding the most accurate and least radiation risk modality for mother and fetus. The objective of this systematic review and meta-analysis was to compare the accuracy of CTPA and V/Q scan to exclude pulmonary embolism in pregnant patients suspected to have PE. Methods: We performed a literature search including MEDLINE, EMBASE, Google Scholar, Cochrane library, and BestBETS until July 2018. We included all the studies comparing CTPA and V/Q scan as the diagnostic modalities. Two reviewers independently identified and abstracted data from eligible studies. Results: Of the screened articles, four studies were eligible to include in this review. All studies were retrospective and used clinical follow-up as the reference standard. A total of 274 CTPA results and 438 V/Q scan results were available for the analyses. When inconclusive results were regarded as negative, the sensitivity and specificity for CTPA were Sn=79% (95% CI 54 to 94) and Sp=100% (95% CI, 99 to 100); and for V/Q scan were Sn=94% (95% CI 71 to 100) and Sp=100% (95% CI 98 to 100). Whereas, when inconclusive results were regarded as positive scan, the sensitivity and specificity for CTPA were Sn=84% (95% CI, 60 to 97) and Sp=87% (95% CI, 83 to 91); and for V/Q scan were Sn=100% (95% CI 80 to 100) and Sp=90% (95% CI 86 to 93). Although the studies were retrospective in nature and overall risk of bias (QUADAS-2) was high. Conclusions: The diagnostic performance of CTPA and V/Q scan were comparable. Therefore, the choice of the appropriate test may depend on the presence of lung pathology, availability of the test, trained personnel, and radiation risk to mother vs. fetus.

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PO_MED_04_02
A Systematic Review For the Role of Systemic Thrombolysis in Intermediate-risk(sub-massive) Pulmonary Embolism
Mohamed A. Seif, Sameer A. Pathan, Tim Richard E. Harris, Mohamed Seif, Sameer Pat than, Mahmoud F. Eltawany

Background and Objectives: Pulmonary embolism represent an extended spectrum of disease. 10% of sub-massive PEs will progress to massive PE, and while overall mortality is around 5%, it ranges up to 30%, highlighting the potential severity of the sub-massive PE. Treating intermediate risk PE is challenging for the potential risks of aggressive therapy. This review aims to assess the effect of adding thrombolytic therapy to standard treatment with heparin on short-term mortality, clinical deterioration, and bleeding in patients who classified as intermediate-risk PE. Methods: A literature search was carried out using Medline, Cochrane Library, Google Scholar, and the available guidelines up to March 2018. References of the selected articles were revised for other possibly related citations. The RCTs were studied and appraised using the Cochrane risk of assessing bias. Results: From 60 potentially relevant studies, six randomized controlled trials (RCTs) were included in this systematic review. A total of 1,568 patients were enrolled, 747 patients received thrombolytic therapy, with alteplase (two trials, 155 patients) or tenecteplase (four trials, 592 patients) and 821 patients were treated with heparin only. None of these RCTs succeeded to prove that adding thrombolytic therapy to standard anticoagulant treatment significantly decrease the early mortality. Five studies proved that thrombolysis prevents clinical deterioration. Five out of six RCTs resulted in a non-significant difference in major bleeding prevalence. Only PEITHO trial proved the opposite. The incidence of minor bleeding with significantly higher in the four studies in which it was measured. Conclusions: Currently, there is inadequate evidence to support the use of systemic thrombolysis for all patients with acute intermediate-risk PE. Although it may prevent clinical deterioration which necessitates escalation of treatment in the short term, this came off the cost of increased risk of bleeding.

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PO_MED_04_03
Cost Evaluation For Admitted Patients at Mafraq Hospital with Presumed Tuberculosis Diagnosis
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Background and Objectives: Tuberculosis (TB) is a global health issue. World Health Organization recommends using Xpert MTB/RIF as an initial diagnostic test to Rules in/out TB within 2 hours. Mafraq hospital current practice involves PCR, and Cultures) which increases their length of stay and an excessive cost as PCR, and Cultures) which increases their length of stay and an excessive cost. The aim of this project is to achieve a sustained compliance with Internationally acceptable standards for undergoing CT scanning of the brain for pediatric minor head trauma at Hamad General Hospital (HGH) Emergency Department (ED). Whilst CT scanning carries an important role in the identification of clinically significant intracranial injuries, there are associated risk of radiation. Our initial audit of clinical notes and survey of EM physicians revealed a rate of 45% CT scans for pediatric minor head injuries with around half of request not indicated. In 36% there were issues with documentation. Methods: We conducted staff education through weekly program of Continuing Medical Education for EM specialists, EM residents and fellows, prominent display and availability of a ready reference handout of the International clinical decision rules (eg, NICE guidelines, PECARN) for CT scanning of pediatric head injuries. Results: We found that there is decreasing rate of CT scans for pediatric minor head injuries at the rate of 22% achieving a reduction by more than 30%. There was also a demonstrable improvement in the documentation by more than 30% (Deficient documentation of the major indication of CT head decreased by a rate of 23%). The overall reduction of and decreasing the percentage of un-indicated CT head by around 30%. Conclusions: Managing minor head injury in pediatric age group becomes safer by increasing the physician awareness and easy their access to the best available evidence based guidelines.

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A Sweet Dilemma: Severe Hyperglycemia Presenting as Involuntary Myoclonic Movements at the Emergency Department: a Case Report

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Background and Objectives: Involuntary spontaneous movements can be attributed to various metabolic or neurologic causes. At the emergency department severe hyperglycemia induced involuntary myoclonic movements is a rare manifestation which can be resolved by prompt recognition and control of glucose level. In this article a case of a patient with no known history of diabetes presenting at the Emergency Department with induced and spontaneous jerking movements in the extremities which was initially diagnosed with a neurologic etiology but was eventually resolved with achievement of euglycemia. Methods: N/A. Results: N/A. Conclusions: It is essential at the emergency department to be able to accurately recognize different presentations of hyperglycemia in order to provide a timely management and prevention of severe complications of uncontrolled diabetes. Its prompt diagnosis can help alleviate unnecessary initiation of medications and circulate especially in a low resource setting. Corresponding Author: Dave Gamboa (dragonrower@yahoo.com)

A Pill Not Taken For Granted-a 78-year Old Female with Adrenal Crisis: a Case Report

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Background and Objectives: Adrenal crisis is a rare but life-threatening sequelae of adrenal insufficiency. This is a case of a 78-year old female self-medicating with dexamethasone tablet, presenting with generalized weakness, anorexia, epigastric pain, and refractory hypertension, associated with skin hyperpigmentation, hypoglycemia, hyponatremia, hyperkcalemia, and mild metabolic acidosis. Having a high index of suspicion, she was immediately treated with aggressive fluid resuscitation, IV hydrocortisone, and vasopressors. Adrenal insufficiency presents with chronic course of illness with vague signs and symptoms. Shock from adrenal crisis is rare and often overlooked by physicians. Thus, making this case a challenge for an emergency physician. Methods: Treatment should be started immediately. The patient was started with 30 mL/kg normal saline for 1 hour to correct hypotension. After which, hydrocortisone 100 mg IV bolus was given. After giving hydrocortisone, one may consider vasopressors like norepinephrine or dopamine. Vasopressors should be given only after steroid therapy in patients unresponsive to fluid resuscitation. Results: These steps were followed with the patient, eventually her blood pressure increased and peripheral pulses improved. She was then referred to IM department for ICU admission. Conclusions: Adrenal crisis is a life threatening disease. It is rare and presents mostly with non specific signs and symptoms. As an Emergency Medicine Physician who is managing multiple patients at a time in the emergency department, diagnosis is a challenge as it relies mostly on detailed history, physical examination, and adjunctive laboratory. Once diagnosed, treatment should be immediately started with aggressive fluid resuscitation, followed by hydrocortisone 100 mg IV bolus, and vasopressors. Most importantly, education with regards to the chronic effects of glucocorticoid treatment and its subsequent life threatening complications should be taught to patients and be emphasized to local doctors as morbidity and mortality increases as treatment is delayed. Corresponding Author: Daniel Unno Hiquiana (uhiquiana@gmail.com)

Cardiac Arrest Secondary to Anaphylaxis-Case Report of an Uncommon Presentation

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Background and Objectives: Anaphylaxis is an uncommon, but serious manifestation of an allergic reaction. Most patients with allergic reactions presenting to the emergency department have minor symptoms and are discharged well. Besides recognition allergy to co-amoxiclav.

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Conclusions: Although rare, cardiac arrest secondary to anaphylaxis to medication does not rule out the possibility of developing allergic reactions in the future. Anaphylaxis is a possible cause for cardiac arrest, especially when the arrest occurs shortly after initiation of a medication.

Effect of Renin-angiotensin-aldosterone System Inhibitors on Short-term Mortality After Sepsis: a Population-based Cohort Study

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Background and Objectives: Antagonists of the renin-angiotensin-aldosterone system (RAAS), including angiotensin converting enzyme inhibitors (ACEI) and angiotensin II receptor blockers (ARB), may prevent organ failure and reduce mortality. We investigated whether specific RAAS inhibitors are associated with reduced all-cause and non-cancer mortality in patients with sepsis. Methods: We conducted a cohort study using the National Health Insurance Research database. A multivariate-adjusted Cox proportional hazards regression model was used to determine the association between RAAS inhibitors and sepsis outcomes. To directly compare ACEI users, ARB users, and nonusers, a three-way propensity score (PS) matching approach was performed. Results: A total of 52,727 patients were hospitalized with sepsis between 2001 and 2011, of whom 7,642 were prescribed an ACEI and 4,237 were prescribed an ARB. Using PS-matched analyses, prior ACEI use was associated with decreased 30-day mortality (hazard ratio [HR], 0.83; 95% confidence interval [CI], 0.75–0.92) and 90-day mortality (HR, 0.85; 95% CI, 0.78–0.93) compared to non-users. Prior ARB use was associated with an improved 30-day (HR, 0.85; 95% CI, 0.79–0.92) and 90-day survival (HR, 0.87; 95% CI, 0.82–0.93). These results persisted in sensitivity analyses focusing on patients without cancer and patients with hypertension. Conclusions: Compared to those who were not taking RAAS inhibitors, the short term mortal-
ty after sepsis was substantially lower among those who were already established on RAAS inhibitor treatment when sepsis occurred.

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The Rate and Time of Epinephrine Administration to Anaphylactic Children Visiting Pediatric Emergency Room

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Background and Objectives: Anaphylaxis is an allergic emergency disease. It is need to differentiated from other allergic disease, and has to treated immediately. There aren’t many studies about anaphylactic children in Korea who visited the emergency room. The objective of this study was to investigate the treatment of anaphylaxis in Korean children.

Methods: We collected the data of anaphylaxis children who visited the pediatric emergency center of Bundang CHA Hospital from Jan 1st, 2015 to Dec 31th, 2017, and analyzed the features, retrospectively.

Results: Among 107 patients, 63 (58.9%) were male and their median age was 4.0 (1.0–8.0) years. Following the severity, mild, moderate and severe patients were 3, 77, and 27, respectively. The median time to administering epinephrine from the onset of symptoms and to visiting emergency room was 89.5 (49.3–143.8) minutes, 28.0 (12.5–57.5) minutes, respectively. These durations were not associated significantly with severity of anaphylaxis. Epinephrine was administered to 76 people, 71% of all patients. Conclusions: In Korean children, anaphylaxis has been treated regardless of its severity, and there are some cases of treating it with other medications, not epinephrine. More educations for diagnosis and treatment of anaphylaxis and careful monitorings for patients are needed for more accurate and rapid treatment.

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Development of a Clinical Score, an Aid For Deciding Between Intravenous and Oral Antibiotics For Urinary Tract Infection/ pyelonephritis in Children

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Background and Objectives: Using intravenous (IV) antibiotics to treat urinary tract infection (UTI)/pyelonephritis in children places a significant burden on patients and health care resources. Despite a recent Cochrane review, guidelines do not clearly state the criteria for IV antibiotics in children with UTI/pyelonephritis. We aimed to derive and validate a clinical score that incorporates clinical features and patient complexity to guide the decision on the route of antibiotics.

Methods: This was an observational study (May’16-March’18) of all children (3 mo-18 yr) diagnosed in ED with UTI/pyelonephritis and subsequently confirmed on urine culture. To derive the score, half the cohort was used (aged 12 mo-12 yr) who met criteria from a recent systematic review. Patients were defined those with and without a ‘true’ need for IV antibiotics using the pre-determined gold standard based on the Cochrane review and route of antibiotic used at 24 hours. Features which were significantly different between the groups were identified. Combinations of these differentiating features were used to generate receiver operating characteristics (ROC) curves. The score was validated on the second half of the cohort and additional cohorts.

Results: 1,240 patients had a confirmed UTI/pyelonephritis: 831 (67%) aged 12 mo-12 yr, 276 (22%) aged 3-12 mo and 133 (11%) aged 12-18 yr. Of those aged 12 mo-12 yr, 335 (40%) met the definition for inclusion, 167 were used to derive the RUPERT score (Rigors, Urological abnormality, Pyrexia (≥ 38°C), Emesis, Tachycardia, Recurrent (>2) UTI—one point each—maximum 6), area under curve (AUC) of 0.85. A score of ≥ 3 to commence IV antibiotics resulted in correct classification of 80% of patients (sensitivity 77%, specificity 81%). In the validation cohort the AUC was 0.8, those not meeting full systematic review criteria AUC 0.82, and those age 12-18 yr AUC 0.86. It was not reliable in those age 3-12 mo AUC 0.58. Conclusions: The RUPERT score can aid clinicians in deciding an appropriate route of antibiotics for UTI/pyelonephritis in children aged 12 mo-18 yr.

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Mummy, I Can’t See!–a Case Report on Complex Febrile Seizure with Todd’s Paralysis

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Background and Objectives: Todd’s paralysis, also known as post-ictal paralysis, is defined as focal neurological deficit(s) after an episode of seizure. Its pathophysiology is still not well understood, but various literature describes reversible post-ictal brain perfusion abnormalities. The paralysis usually affects the same side of the focal convulsion, and may persist from minutes to hours, sometimes even days. Here we describe a patient who had a complex febrile seizure, complicated with Todd’s paralysis. Methods: A 3-year-7-month-old girl, previously well, was rushed to the Emergency Department by her parents after a seizure episode and subsequently diagnosed with Todd’s paralysis.

Methods: The primary outcome was the inter-rater agreement of pharyngeal injection (PI) and palatine tonsillar hypertrophy (PHT) and the secondary outcomes were inter-rater agreement of PI and PHT of subgroups by the major and clinical experiences. The agreement was calculated in percent agreement, Fleiss’ kappa (for PI), and Kendall’s W (for PTH). Results: There were total 33 raters in this study. The overall percent agreement of PI was 0.669 and the Fleiss’ Kappa was 0.296. The inter-rater reliability was similar before and after the provision of history. The overall percent agreement of PTH was 0.408 and the Kendall’s W was 0.674. With the provision of medical history, Kendall’s W became higher (0.692). In subgroup analysis, the Fleiss’ Kappa for PI ranged from 0.257 to 0.33s and the Kendall’s W for PHT ranged from 0.593 to 0.711. Conclusions: For children visiting ED, the agreement of PTH was more reliable than PI. The inter-rater reliability didn’t improve despite of more clinical experiences. There should be more efforts to improve the accuracy of children’s throat examination, including development of standardized grading system of PI and proper training.

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Underuse of Epinephrine For Pediatric Anaphylaxis Victims in the Emergency Room: A Population-based Study
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Background and Objectives: Epinephrine is a key drug for treating anaphylaxis; however, its underuse is still a significant issue worldwide. The objective of this study was to compare epinephrine use between pediatric and adult patients who were treated with anaphylaxis in the emergency room. Methods: The data were retrieved from the National Sample Cohort of South Korea, which contains claim data from the National Health Insurance Service. We included patients who visited the emergency room with a discharge code of anaphylaxis between 2004 and 2013. We assessed prescription information of epinephrine, antihistamine and systemic steroid, previous medical history and discharge disposition from the emergency room. The study population was categorized based on age at the visit. Results: A total of 175 pediatric and 1605 adult patients with anaphylaxis were identified. Only 42 (24%) of the pediatric patients were treated with epinephrine while 592 (36.9%) of the adult patients were treated with epinephrine (p=0.001). Furthermore, the pediatric patients were less likely to be treated with systemic steroid than the adult patients (6.9% vs. 12.3%, p=0.047). The odds ratios for the administration of epinephrine relative to the baseline in the 19-65 age group were 0.34 (95% CI: 0.15-0.67), 0.56 (95% CI: 0.28-1.03) and 0.79 (95% CI: 0.45-1.33) in the <7, 7-12 and 13-18 age groups, respectively. Conclusions: The pediatric anaphylaxis patients experienced a lower rate of epinephrine injection use than the adult patients and the injection use decreased as age decreased.
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Acute Transverse Myelitis in an Acute Hemiparesis Child
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Background and Objectives: Unilateral hemiparesis is an uncommon but possible presentation for acute transverse myelitis. Acute transverse myelitis is an acquired immune-mediated central nervous system disorder that can present with rapid onset of body weakness, sensory alterations and bowel and bladder dysfunction. The diagnosis can be a challenge in younger age group especially in emergency setting. So far there is no reported literature in Malaysia on similar presentation. Methods: We reported a case of 15 months old boy who presented to emergency department with an acute onset of right hemiparesis. Initial CT brain showed no intracranial bleed or ischemic stroke. Magnetic resonance imaging of the spinal cord showed increased T2 spinal cord signal intensities from C4-C5 to T6 levels. No magnetic resonance imaging features of acute disseminated encephalomyelitis within the brain. Eye assessment showed absence of optic neuritis. Results: Diagnosis of acute partial transverse myelitis was made. High dose methylprednisolone was initiated and followed by intravenous immunoglobulin after patient showed poor response to steroid. The patient’s prognosis was deemed guarded due to no improvement seen after both treatment. Conclusions: Differential diagnosis can be a challenge in a young child presented with asymmetrical body weakness in an emergency setting. Acute transverse myelitis is a diagnosis of exclusion. Clinical history, examination and imaging are particularly invaluable to come to diagnosis of acute transverse myelitis as the earlier initiation of treatment may improve the outcome of disease.
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Keeping Kids Safe During Resuscitation: the Monash Children's Paediatric Emergency Medication Book
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Background and Objectives: Following a significant medication error at our institution, we developed a weight-based pediatric emergency medication book. The book was developed by a working group of clinical staff from paediatrics, emergency, anaesthesics and PUCI, and provides a weight-based guide to: - medication doses in resuscitation settings (such as cardiac arrest, intubation); - endotracheal tube size and positioning; - emergency management of seizures, group, anaphylaxis, asthma, major haemorrhage, and electrolyte abnormalities; - infusions for critically ill patients; - management of acute behavioural disturbance, procedural sedation/medication, and treatment of GI bleeding. The book was launched in 2014 with a new edition released in 2018. The book is now widely used across Australia and utilised in Advanced Pediatric Life Support courses, with over 900 copies distributed. The resource has the potential to improve mortality of critically ill children worldwide, by improving management and reducing risks from medication error. The book is currently being adapted for use in Low- and Middle-Income settings.
Methods: - Results: - Conclusions: - Corresponding Author: Simon Craig (simon.craig@monash.edu)

Appropriateness of CTPA Usage in Suspected Pulmonary Embolism: Local Hospital Audit
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Background and Objectives: CT Pulmonary Angiography (CTPA) is the recommended primary imaging modality for suspected pulmonary embolism (PE). Wells score is the most common scoring system used to predict the presence of PE. It helps to stratify patients into different risk groups and guide further investigation. A low or intermediate Wells score, coupled with negative D-dimer reliably excludes PE; therefore avoiding the need for CTPA. We performed a retrospective audit in our centre to examine adherence to NICE guidelines in suspected PE patients and to see whether CTPA has been an over-ordered test. Methods: 262 patients who underwent CTPA over a 6 months period were included in this audit. Demographics (including age, gender, clinical presentations, venous thromboembolism risk factors), Wells score, D-dimer level and CTPA reports were analysed from E-noting health records and NIMIS. Results: Mean age was 62 years. 54% were female. 26.7% of patients were PE positive on CTPA; and of these 13.3% were immobile and 9.9% had underlying malignancy. Mean age of PE positive patients was 64.3 years; with 20% of them were smokers. The most common presentations were dyspnoea (45.8%), followed by chest pain (37.4%). 24 out of 55 patients (43.6%) who were low risk with raised D-dimer had PE on CTPA. 30% (36 out of 119) of intermediate risk patients with raised D-dimer found to have PE on CTPA. 2 out of 5 of high risk patients were PE positive. 21.7% (57) of patients who were determined to be low or intermediate risk with normal D-dimer were also underwent CTPA. Lower respiratory tract infection (LRTI) was the most common alternative diagnosis. Conclusions: We concluded that CTPA has been an over-ordered test in our centre and could have been avoided in 57 (21.7%) patients if the local CTPA referral protocol as per NICE guidelines were strictly adhered to by the clinicians.
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Endoscopic and Anatomo-pathological Aspect of Esophageal Cancer in the Hospital Endoscopy Unit of the “G” Point: Case in Mali
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Background and Objectives: The purpose of the study was to determine the frequency of esophageal cancer in the Endoscopy Unit of the Department of Internal Medicine at Point “G” National Hospital and to describe its endoscopic and pathological aspects. Methods: We performed a retrospective study of patient records seen endoscopically in this unit from January 1990 to December 2000, a period of 11 years. The inclusion criterion was the presence of oesophageal tumor at upper gastrointestinal fibroscopy whose malignancy was confirmed by anathomopatho-
ED-acquired Polytrauma-Life-threatening Complication of Seizures

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Background and Objectives: Multiple trauma caused by seizures occurs very rarely. We present a patient who sustained severe injuries by having alcohol withdrawal seizures. He survived a cardiac arrest based on a hemorrhagic shock on therapy with phenytoin. Bone fragments had eroded pelvic arteries. Methods: Interdisciplinary case report, review of pertinent literature. Results: A 68-year-old man was referred to ED for an unclear tremor. Medical history: mechanical replacement of the aortic valve, medication of phenytoin, alcohol abuse. During waiting time he presented alcohol withdrawal syndrome and two seizures. For hypotension he received volumes, before he suddenly arrested in PEA. The pale patient entered the ICU in severe shock. An emergency gastroscopy excluded an active gastric bleeding. He developed a palpable abdominal mass, so CT scan was done. It showed polytraumatization: bilateral acetabular fracture, pertrochanteric femur fracture, bilateral humerus fracture, splenic rupture and a huge hematoma removed. The postinterventional CT scan still showed a huge hematoma removed. The postinterventional CT scan still showed a huge hematoma removed. The postinterventional CT scan still showed a huge hematoma removed. The postinterventional CT scan still showed a huge hematoma removed. The postinterventional CT scan still showed a huge hematoma removed. The postinterventional CT scan still showed a huge hematoma removed. The postinterventional CT scan still showed a huge hematoma removed. The postinterventional CT scan still showed a huge hematoma removed.

Conclusions: Seizures with alcohol withdrawal can be associated with severe multiple injuries. They represent a life-threatening complication. Recognition and management of these injuries can be challenging.

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A Robust Real-time Monitoring System in Correlation Analysis of Seizure and Heart Rate Variability in Patients Resuscitated From Cardiac Arrest

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Background and Objectives: Cardiac arrest, with the incidence is 50 to 100 per 100,000 person-years, is a clinical disaster with approximately 20% rate of receiving return of spontaneous circulation (ROSC) and less than 10% of survival at discharge. Post-cardiac arrest syndrome (PCAS) which includes brain injury, myocardial dysfunction, and systemic ischemia, deteriorate the prognosis. Patients with episodes of seizures would be vulnerable to another cardiac arrest due to hypoxic-ischemic brain injury and trapped at a vicious cycle. To early detect seizures and take preventive actions is clinically challenging. In this study, we established a robust monitoring system to detect potential seizures in critical care. Methods: We construct a real-time network which recorded simultaneously the information in the physiological monitor (IntelliVue MX800™, Philips) with the electrocardiogram (EKG), dual-channel electroencephalography (EEG), blood saturation, and arterial blood pressure. A novel algorithm launched the association of EKG and EEG in analysis of heart rate variability (HRV) via fast Fourier transformation, which include time, frequency domain and non-linear analysis. We prospectively recruited the patients who suffered from cardiac arrest, received ROSC and admitted to intensive care unit (ICU) in National Taiwan University Hospital (NTUH) since January, 2018. Results: The raw digit code was synchronized by a real-time analysis system, and recorded in a time-based database combined with EEG. Additionally, we found that the parameters of HRV such as R-R interval, the power ratio of low-to-high frequency (L/HF) significantly decreased before and during the seizure time compared with normal EEG period. Conclusions: In this study, the robust monitor system was established. The signals of EKG are successfully correlated with those in EEG. The prior HRV signals might reflect the later abnormal EEG in critical patients after cardiac arrest.

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The Hat Classification of Capnography

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Background and Objectives: Continuous waveform capnography has become the gold standard for monitoring patients undergoing deep sedation, dissociative sedation or general anaesthesia. It is used in cardiorespiratory resuscitation and recommended in procedural sedation, during the intubation of patients and during transfer of intubated patients. It serves an important function to aid patient diagnosis and ventilator trouble shooting. Intubation outside of the operating room presents a series of unique challenges to the practitioner, where the incidence of failed intubation is higher. It is therefore vital that doctors are familiar with the general ward with intravenous antibiotics for pneumonia. At this point, his CURB 65 score would have scored ‘one’ for hypotension, or ‘two’ if his urea level was raised; this would have translated to possible outpatient management. Results: His renal panel returned to show glycoproteinaemia of 1.4 mmol/L, severe metabolic acidosis (bicarbonate 7.6 mmol/L) with a high anion gap (36.3 mM/L) and acute kidney injury (creatinine 238 mmol/L, urea 8.5 mmol/L). White blood cell count was normal at 9.18 × 109/L. Within the next few hours the patient developed respiratory distress and required intubation and mechanical ventilation. Despite intensive care and emergent dialysis, the patient died the next day. Nasopharyngeal swab grew Streptococcus pneumoniae. Conclusions: Other scoring systems like the quickSOFA, Pneumonia Severity Index (PSI), Severe Community Acquired Pneumonia (SCAP) score and SMART-COP score would have identified this patient as high-risk compared to the CURB 65 score. The EP should be very cautious discharging patients based on a low CURB 65 score. Cross-referring with other scoring systems is recommended.

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various waveforms that may be encountered. Methods: The physiology during a normal waveform is described. We present a unique and novel method to remember and recognise important and frequently seen capnography wave forms by comparing them to familiar hats: a top hat, a sailor captains hat, a Stetson cowboy hat, a witch hat and no hat at all. Results: Capnography waveform has been used in the operating room for some time and is now becoming more widely used in other settings, including the emergency room, yet it remains poorly understood. The Hat Classification of Capnography provides a rapid bedside teaching tool which encourages awareness and discussion between health care providers. It has been used to teach trainee doctors with excellent feedback. Conclusions: This original, de novo and easy to recall method for remembering capnography waveforms is simple, reproducible and can be used as an informal teaching aid in any setting. Corresponding Author: Charlotte Elliott (drcelliot@gmail.com)

Risk Factors For Mortality in Patients with Acute Respiratory Distress Syndrome (ARDS) in Vietnam

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Background and Objectives: Prediction of outcome in patients with acute respiratory distress syndrome (ARDS) is of major importance for appropriate clinical management decisions. The aim of the study was to elucidate the risk factors of mortality in hospitalized patients with ARDS in Vietnam. Methods: The retrospective observational study was performed in a national central hospital in Hanoi, Vietnam. Subjects were adult patients (≥18 years) who admitted and were diagnosed ARDS at the emergency department or ICU in the study site between 2015 and 2017. The data on patients’ general and clinical backgrounds and conditions, radiographic findings, ventilator settings, gas exchange, and treatments were collected and compared between survivors and non-survivors. The risk factor for mortality was assessed using a logistic regression analysis. Results: Total 126 patients (mortality, 57.1%) were eligible. In all patients, 94.4% were transferred to ICU, and Survivors (183.9 ± 52.5) and survivors (120.0 ± 40.9) of gas exchange, mean (±SD) were 183.9 ± 52.5 and 120.0 ± 40.9. The patients were divided into two category: ARDS and non-ARDS. The absolute delta change of hs-TnI was measured on admission and after 3 hours. The patients were divided into two category: AMI and non-AMI. The final diagnosis was adjudicated by two independent cardiologists. We assess the diagnostic accuracy of absolute and relative changes of that. Results: Of the 281 patients, 73 (26%) were diagnosed with a AMI. The area under the receiver operating characteristic (ROC) curve was 0.753 (95% CI, 0.698-0.802) for the presentatio

Fast Heart Made Confused, VT or Not VT: A Case Report of Idiopathic Fascicular Left Ventricular Tachycardia

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Background and Objectives: Idiopathic Fascicular Left Ventricular Tachycardia (IFLVT) is the most common idiopathic ventricular tachycardia (IVT) of left ventricle, typically seen in young patient without structural heart disease. It accounts for 10-15% of all IVT. Methods: Case note review. Results: A 28-year-old lady presented to Emergency Department with history of intermittent palpitation for one week. She relieved other associated symptoms such as dyspnoea, chest pain, tremors, loss of weight and fever. Vital signs showed blood pressure of 98/63 mmHg with pulse rate 160 bpm. There was no cardiac abnormalities on clinical examination and bedside echocardiography. Blood investigation revealed no electrolytes derangement. Electrocardiography (ECG) was initially interpreted as atrial fibrillation (AF) with right bundle branch block. Vagal maneuver, Beta Blocker and Digoxin failed to terminate the arrhythmia. Upon consultation with physician, ECG was being identified as narrow complex ventricular tachycardia (VT) with AV dissociation and right bundle branch block. IV Amiodarone was given but failed to terminate the VT. Arrhythmia was finally terminated after IV Verapamil 7.5 mg. Patient was subsequently discharged well with no more palpitations and given outpatient referral to a cardiac centre for catheter ablation. The differential diagnosis of narrow complex irregular tachycardia is usually AF which was the diagnosis initially given. Pharmacological management of stable AF can range from Beta Blockers to Digoxin to Amiodarone, which were given in this case. The diagnosis of IFLVT is based on RBBB, left axis VT with narrow QRS complex. However, this can be missed or mistaken. Therefore, if standard methods to revert the arrhythmia fails, a diagnosis of IFLVT should be considered, in which Verapamil is the first line. Conclusions: The diagnosis of ECG rhythm that is rarely encountered remains a challenge in Emergency Department. It requires high suspicion to diagnose and provide appropriate treatment to the patient of IFLVT.

It's Early Morning and I Can't Breathe: a Case of Apical Hypertrophic Cardiomyopathy with Pouch in 31 Year Old Policeman

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Background and Objectives: Apical hypertrophic cardiomyopathy is first described by Sakamoto in 1976 as a rare variant of hypertrophic cardiomyopathy that occur in Japanese patients. The advancement of Emergency Department Imaging utility like bedside ultrasound will assist in early detection of this problem. Despite being coined as benign, serious cardiovascular complication may follow and those with apical pouch has the worst outcome. Methods: Case Report. Results: We describe a case of 31-year-old Male Police Officer of Bajau ethnicity who presented to local Health Clinic with first episode of sudden onset severe breathlessness at 2.00 AM that awakened him from sleep. Upon arrival to Health Clinic, he was asymptomatic and vital sign were within normal limit. His initial ECG showed sinus rhythm, ST segment depression with T inversion in lead II, aVL, V3-V6 and ST segment elevation in lead aVR. He was referred to our center for further evaluation. In Emergency Department, he was haemodynamically stable and denied...
symptoms of acute coronary syndrome. Repeated ECG showed sinus rhythm, left ventricular hypertrophy and Giant T wave inversion with ST Depression in lead I, II, aVL, V3-V6. Emergency Department Bedside Ultrasound showed apical hypertrophic cardiomyopathy with spade shape appearance of the left ventricle in diastole. Conclusions: Apical hypertrophic cardiomyopathy should be suspected in a fit and active young people who presented with dyspnoea but normal physical examination. Emergency Department Bedside Ultrasound play an important role in making early diagnosis, therefore ensuring proper treatment and follow up can be instituted.

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High-sensitivity-cardiac Troponin I vs. T For the Accelerated Diagnosis of Acute Myocardial Infarction- a Systematic Review and Meta-Analysis
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Background and Objectives: The introduction of high sensitivity cardiac troponin (hs-cTn) has accelerated the diagnosis of acute myocardial infarction (AMI). However, the reported accuracy of hs-cTn-based accelerated diagnostic algorithms vary across studies. We aimed to compare the diagnostic performance of various accelerated hs-cTn and hs-cTnT diagnostic algorithms in patients with symptoms suggestive of acute coronary syndrome (ACS). Methods: Relevant studies were searched from PubMed and Embase databases from inception through May 2018. Studies that investigated the diagnostic accuracy of hs-cTn and hs-cTnT for 0-, 1-, and 2-hour diagnostic algorithms were included. We conducted a random-effects bivariate meta-analysis to estimate the summary sensitivity, specificity, positive and negative likelihood ratios, and AUROC. Results: A total of 62 studies comprising 67,945 patients were included. The hs-cTnT-based 0-, 1-, and 2-hour algorithms have a sensitivity of 93%, 92%, and 93%, respectively. The hs-cTnT-based 0-, 1-, and 2-hour algorithms have a comparable sensitivity of 93%, 95%, and 96%. The hs-cTnT-based algorithms all have a specificity of greater than 80%. The hs-cTnT-based algorithms have a specificity of 68% for 0-hour algorithm and a specificity of greater than 80% for 1- and 2-hour algorithms. The overall heterogeneity of all rapid diagnostic algorithms was mild (I²<50%). Subgroup analysis revealed the diagnostic accuracy was higher in ED settings than in non-ED settings and among patients with AMI compared to patients with NSTEMI. Conclusions: Both hs-cTn and hs-cTnT-based accelerated diagnostic algorithms have a high sensitivity but moderate specificity for early diagnosis of ACS. The hs-cTnT-based algorithms tend to have a slightly better specificity in early diagnosis of ACS.

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Atrial Myxoma Associated Myocardial Infarction: a Case Report to Demonstrate the Importance of Focused Cardiac Ultrasound in Acute Myocardial Infarction
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Background and Objectives: Atrial myxoma is the commonest primary cardiac tumour and is rarely associated with acute myocardial infarction. Methods: We report a case of atrial myxoma associated acute myocardial infarction and present its clinical and echocardiographic findings. Results: A 69-year-old man with history of ischemic stroke 5 years ago, presented to emergency department with sudden onset of retrosternal chest pain. His electrocardiogram showed ST segment elevation in Leads II, III, aVF, VR4-VR6 and ST segment depression in Leads I, aVL, V1-V4, consistent with acute interposterior myocardial infarction with right ventricle involvement. A focused cardiac ultrasound prior to thrombolysis revealed a mobile pedunculated mass in the left atrium. In view of presence of the intracardiac tumour and the possibility of coronary embolism due to the tumour, the patient was sent for primary percutaneous coronary intervention. The patient was successfully treated with intracoronary aspiration of blood clot from the right coronary artery, followed by surgical excision of the tumour. Conclusions: Focused cardiac ultrasound is important in managing acute myocardial infarction to detect rare but serious cardiac pathologies such as myxoma, which is a contraindication for thrombolysis. Catheter-based intervention in acute myocardial infarction in the presence of myxoma may prevent complication of thrombolysis such as dev- astating bleeding from the tumour, tumour embolization and failed thrombolysis in cases of coronary artery occlusion caused by embolized tumour fragments.

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Widespread ST Depression with Isolated ST Elevation on Lead AVR: a Sign Calling For More Invasive Strategy (the Diagnostic Cardiac Catheterization, Followed by Coronary Artery Bypass Surgery)
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Background and Objectives: Widespread ST Depression (STD) with isolated ST Elevation (STE) on lead aVR indicated the underlying concealed left main coronary artery occlusion. It was also the dangerous electrographic pitfall of non-ST-segment elevation myocardial infarction (NSTEMI). Methods: We present three cases with initial electrocardiography(ECG) of widespread STD with isolated STE on lead aVR. All cases were presented with chest pain and acute pulmonary edema. Early coronary evaluation revealed critical lesions in left main coronary artery (LMCA) in all three cases. Results: Two cases was bridged to successful surgical intervention with coronary artery bypass grafting (CABG). One case, unfortunately, was not survived due to refusing CABG. Conclusions: Acute coronary syndrome is a cardiovascular emergency associated with significant morbidities and mortalities. CABG was the historical standard for management of LMCA disease. ECG is a critical diagnostic step based on which further treatment strategy can be planned. STD suggests myocardial ischemia or injury consistent with NSTEMI or unstable angina, in which medical treatment is the first priority. According to 2015 AHA guidelines of stabilization of the patient with Acute Coronary Syndromes, the early invasive strategy should be initiated for NSTEMI patients of signs of pump failure. In ECG interpretations, lead aVR, in contrast to other leads, is seldom noticed until recent years when it is increasingly emphasized. Isolated STE on lead aVR may be a hallmark of critical lesions in the LMCA that necessitates more immediate invasive strategy (the emergent diagnostic cardiac catheterization, followed by CABG). We present the ECG image of three cases. Two cases accepting CABG had good outcome and survived without neurological complication. By contrast, one case was not survived as the result of refusing CABG.

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A Rare Case Presentation of Subacute Ischemic Atrial Wall Rupture
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Background and Objectives: Cardiac tamponade as a result of a ruptured ischemic left atrial wall is a rare presentation. Methods: A 67 years old gentleman presented with classical chest pain. Patient had just been treated for Non-ST Elevation Myocardial Infarction with Dresslers Syndrome and pleural effusion. He was hypertensive (88/52 mmHg), tachycardic (110 bpm) and breathless (40/min with SPO2 90% on room air). Bed side echo was performed and the diagnosis was confirmed with pericardial tamponade and right ventricular wall collapse. Ultrasound guided pericardiocentesis was performed and 100 mLs of blood stained effusion was evacuated.Color doppler subsequently showed an abnormal color flow signal traversing the left myocardial wall suggestive of atrial wall rupture. The catheter was repositioned with recurrent obstruction occurring secondary to clots. Patient subsequently arrested 4 hours later. A total of 1,000 mL of blood and effusion was drained. Results: A subacute myocardial wall rupture is defined as an ischemic wall rupture that is not associated with sudden death [1]. Atrial wall rupture is associated with a significantly higher mortality [2, 3]. Patients who have an acute free wall rupture will instantaneously arrest with rapidly irreversible cardiac electromechanical dissociation and intractable shock as a result of cardiac tamponade [2]. However for those with subacute wall rupture, when diagnosed early, are ide-
Validation of the Mortality in Emergency Department Sepsis Score in a Singaporean Cohort

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Background and Objectives: The Emergency Department (ED) serves as the first point of hospital contact for many septic patients. Early mortality risk stratification using a quick and accurate triage tool would have great value in guiding management. The Mortality in Emergency Department Sepsis (MEDS) score was developed to risk stratify patients presenting to the ED with suspected sepsis, and its performance in the literature has been promising. We report in this study the first utilization of the MEDS score in a Singaporean cohort.

Methods: In this retrospective observational cohort study, adult patients presenting to the ED with suspected sepsis and fulfilling Systemic Inflammatory Response Syndrome (SIRS) criteria were recruited. Primary outcome was 30-day In-Hospital Mortality (IHM) and secondary outcome was 72-hour mortality. MEDS, Acute Physiology and Chronic Health Evaluation II (APACHE II), and Sequential Organ Failure Assessment (SOFA) scores were compared for prediction of primary and secondary outcomes. Receiver operating characteristic (ROC) analysis was conducted to compare predictive performance. Results: Of the 294 patients included in the study, 46 patients (18.5%) met 30-day IHM. MEDS score achieved an area under the ROC curve (AUC) of 0.87 (95% Confidence interval [CI], 0.82-0.93), outperforming the APACHE II score (0.77, 95% CI 0.69-0.85) and SOFA score (0.78, 95% CI 0.71-0.85). On secondary analysis, MEDS score was superior to both APACHE II and SOFA scores in predicting 72-hour mortality, with AUC of 0.88 (95% CI 0.82-0.95), 0.81 (95% CI 0.72-0.89), and 0.79 (95% CI 0.71-0.87) respectively. In predicting 30-day IHM, MEDS score ≥ 12, APACHE II score ≥ 23, and SOFA score ≥ 5 performed at sensitivities of 76.1%, 67.4%, and 76.1%, and specificities of 83.3%, 73.9%, and 65.0% respectively. Conclusions: The MEDS score performed well in its ability for mortality risk stratification in a Singaporean ED cohort.

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tion. Western blot, qRT-PCR. Mitochondrial membrane potential. **Results:** LncRNA SOX2OT is overexpressed in septic cardiomyopathy along with the mitochondrial dysfunction. **Conclusions:** Mitochondrial dysfunction is thought to play an important role in the pathogenesis of many different disease states such as organ dysfunction in sepsis. In this study, we found that LPS caused mitochondrial dysfunction as indicated by overproduction of mROS and the reduction in mitochondrial membrane potential after LPS treatment. The loss of mitochondrial membrane potential increased the mitochondrial permeability, which lead to the accumulation of cytosol Cytochrome c. In particular, we firstly demonstrated that SOX2OT was upregulated in LPS-induced septic cardiomyopathy, and knockdown of SOX2OT in cardiomyocytes could restore the homeostasis of mitochondria, while overexpression of SOX2OT showed the opposite results, suggesting SOX2OT is a detrimental factor for mitochondrial dysfunction in septic cardiomyopathy.

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**Interleukin-36β Activates Autophagy of CD4+CD25+ Regulatory T Cell and Inhibits Its Immunosuppressive Activity in Sepsis**

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**Background and Objectives:** Sepsis involves a dysregulated host response to infection, leading to a high mortality rate. As part of this dysregulation, CD4+CD25+ regulatory T cells (Tregs) play an essential role in sepsis-induced immunosuppression. Here, we studied the effects of interleukin (IL)-36 cytokines, which are newly described members of the IL-1 cytokine family, on CD4+CD25+ Tregs and their underlying mechanism in sepsis. **Methods:** Our study was designed to investigate the impacts of IL-36 cytokines on murine CD4+CD25+ Tregs in presence of lipopolysaccharide (LPS) and in a mouse model of sepsis induced by caecal ligation and puncture (CLP). IL-36-activated autophagy was evaluated by autophagy markers (LC3-II, Beclin 1, p62), autophagosome formation and autophagic flux. **Results:** We provide evidence that IL-36α, IL-36β, and IL-36γ are expressed in murine CD4+CD25+ Tregs. Stimulation of CD4+CD25+ Tregs with LPS markedly upregulated the expression of these cytokines, particularly IL-36γ. IL-36γ strongly suppressed CD4+CD25+ Tregs under LPS stimulation and in septic mice challenged with CLP, resulting in the amplification of Th1 responses and the proliferation of effector T cells. Mechanistic studies revealed that IL-36γ triggered autophagy of CD4+CD25+ Tregs. These effects were significantly attenuated in the presence of the autophagy inhibitor 3-methyladenine (3-MA) or Beclin 1 knockdown. Additionally, early IL-36γ administration reduced the mortality rate of CLP mice. Depletion of CD4+CD25+ Tregs before the onset of sepsis obviously abrogated IL-36γ-mediated protection against sepsis. **Conclusions:** These findings suggest that IL-36γ diminishes the immunosuppressive activity of CD4+CD25+ Tregs by activating the autophagic process, thereby contributing to improvement of the host immune response and prognosis in sepsis.

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**PO_SEP_03_07**

**Predictors of Mortality in UTI Caused by ESBL-producing Enterobacteriaceae in the Emergency Department**

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**Background and Objectives:** Therapeutic options for infections caused by extended-spectrum beta-lactamase-producing Enterobacteriaceae (ESBL-E) are very limited. We performed a single-center retrospective study to identify predictors of mortality among patients with urinary tract infection (UTI) caused by ESBL-E in the emergency department (ED). **Methods:** We studied patients diagnosed with UTI in the ED between January 2014 and December 2017 with urine cultures positive for ESBL-E. Patients were divided into survivors (case group) and survivors (control group). A 1:4 matched case-control study was performed, and sex and age (± 8 years) were matched for each case. **Results:** Empirical antibiotics prescribed by emergency physicians were inappropriate in 72% of the study population even though they were revised to effective treatments within a median time of 9 hours in non-survivors. Twenty-five percent of case patients showed resistance to piperacillin-tazobactam as well as 90% of resistance to ciprofloxacin. Carbapenem and amikacin were only used in 7% and 0%, respectively, in the case group although the isolates were 100% and 97% sensitive to these antibiotics. In a multiple logistic regression analysis, predictors of mortality were being bedridden, underlying malignancy, and a higher score of quick Sequential (Sepsis-related) Organ Failure Assessment (qSOFA). **Conclusions:** We suggest the active use of amikacin (+ piperacillin-tazobactam) for UTI patients at risk of ESBL-E infection in the ED especially when poor prognosis is expected. Furthermore, carbapenem should be more aggressively considered as first-line treatment in those patients in order to improve the efficacy of empirical antimicrobial therapy.

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**Canadian Emergency Department Cyber Vulnerabilities**

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**Background and Objectives:** At some point in our working day all hospital based caregivers will log into a networked device to assist in patient diagnosis and treatment. We assume that the data we receive–lab results, dictated reports, allergies, etc.–is reliable whenever health care decisions are made. Further, many of the machines that observe and care for our patients–such as monitors and IV pumps–receive, rely on and transmit data through networks constantly. Finally cyberattacks, ransomware and data leaks have become frequent occurrences. Despite the fact that both human decisions and machine behavior assume the stability and reliability of data networks there has been little to no research on Canadian Emergency Departments risks of, vulnerabilities to and preparedness for cyberfailure. This study reviews the methods we access, use and distribute data, the resulting vulnerabilities and ability to respond to a cyber-failure. **Methods:** Distributed survey via the Canadian Association of Emergency Physicians, the Emergency Nurses Affiliation, Association des Medecins l’Urgence du Quebec and affiliated Canadian organisations. The researchers comprise of two academic emergency physicians from McMaster University and McGill University and two IT security researchers from Concordia University ans Montreal Polytechnique. This study is in co-ordination with the national program on cybersecurity of HealthCareCan. **Results:** Still pending, should be ready by conference time. **Conclusions:** It is likely, based on anecdotal data and experiences in other similar countries and systems, that there is a significant risk of cyberfailure coupled with a lack of readiness for same.

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**PO_DIS_03_02**

**Preparedness of Emergency/disaster Medical Response During 2020 Tokyo Olympic/Paralympic Games From the Perspective of Academic Consortium**

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**Background and Objectives:** A huge number of visits to Japan especially to megacity of Tokyo during the Tokyo Olympic and Paralympic Games in 2020 absolutely result in the increase of injury/illness and burden the routine emergency medical services system. Furthermore, extremely hot and humid weather in this season and terrorism are certainly marked risks. **Methods:** In order to fulfill our mission as academic organizations, the Japanese Association for Acute Medicine (JAAM) and six academic associations have initially established an academic consortium (AC2020) has been launched as a task force to accomplish consortium activities; make statements and recommendations, compile manuals, conduct seminars, and coordinate the training program of on-site medical teams. The AC2020 organizes nine working groups of heat stroke, lighting strike, nursing, athletes, first responders, foreigners, pre-/in-hospital response of MCI, and data collection for audit. **Results:** As of September in 2018, AC2020 have released a total of 28 documents and 10 event-news on the website (http://2020ac.com/) including six statements, two recommendations of prerequisites of the on-site medical team, two manuals concerning the treatment of gunshot and explosive injuries. Based on some of these statements, the Tokyo Government has already enhanced the previous plan. **Conclusions:** The AC2020 will propose the web site as a platform, disseminate the activities widely to society,
and ask for the cooperation of other related organizations and other academic societies. The AC2020 will aim to provide the landmark project of mass-gathering medical care in Japan as well as transition to the next Olympic Games (Paris in 2024).

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PO_DIS_03_03

Development of an Integrated Emergency Operations Plan For Mass Casualty Incidents and Diseases with Epidemic Potential at a Dedicated Emergency Centre in Cameroon

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Background and Objectives: Mass casualty incidents (MCI) such as terrorist attacks and epidemic-prone diseases are major public health concerns in most Western and Central African countries. However, the standardized emergency operations plan (EOP) has rarely been implemented in those regions. Our aim was to develop an integrated EOP for both MCI and diseases with epidemic potential for emergency centres in resource-limited settings. Methods: We organized a working group to draft an integrated EOP for MCI and diseases with epidemic potential at a dedicated emergency centre in Yaoundé, Cameroon. A three-day workshop convened to (1) prioritize the needs using Hazard Vulnerability Analysis (HVA) Tool developed by Kaiser Permanente, (2) to reach a consensus on the draft, (3) to conduct a table-top exercise for a disease outbreak, and (4) to formulate a full-scale MCI exercise. We performed the full-scale exercise with coordinated evaluation using performance indicators. Results: The EOP consisted of a legal framework, organizing the response system, and plans for MCI and diseases with epidemic potential. Fifty-five representatives from each department and central government attended the workshop. Cholera and civil disorder were prioritized by the HVA among natural and man-made hazards, respectively. The participants conducted a table-top exercise on the cholera outbreak. In total, 110 staffs participated in the full-scale exercise on a hypothetical large-scale traffic accident with other public agencies and media. Incident command system was implemented to control and coordinate each section. The evaluation demonstrated timely mobilization of resources but also the need for better compliance with the protocol. Conclusions: An integrated EOP for MCI and diseases with epidemic potential was developed at a dedicated emergency centre in Cameroon. A need exists for further development of more generalizable response plans standardized for resource-limited settings.

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PO_DIS_03_04

Attacks on Healthcare in Conflict Zones: What Information Do We Need to Understand Their Impact?—a Delphi Study

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Background and Objectives: Attacks on healthcare personnel and facilities are a shocking reality in conflict zones. The scale of these attacks is becoming better understood through data collection but less well understood are the consequences of these attacks. The purpose of this study was to understand what information was needed in our understanding of the immediate, wider and long-term impacts of attacks on healthcare. Methods: We used the classical three-round Delphi method to seek consensus from experts in the field of study of attacks on healthcare to answer the study question. Results: 17 experts took part in Round 1, 16 in Round 2 and 13 in Round 3. The experts generated a total of 222 unique statements identifying those data and information that would improve understanding of the impacts of attacks on healthcare; of which 162 reached consensus. All statements were categorised into 12 themes, each addressing different types of impacts. Conclusions: The Delphi revealed disagreement on how widely the World Health Organization (WHO) definition of an attack on healthcare should be interpreted and therefore what constitutes an impact of an attack. This became apparent when distinguishing between the impacts of an attack on healthcare and the impacts of conflict itself on health. Nonetheless, the statements produced from this study will be of use to academics and data collectors in guiding their research and expansion of the evidence base on attacks on healthcare.

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PO_DIS_03_05

Disaster Trends in Our Country and How We Planned to Respond

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Background and Objectives: Disaster trends are indicators—they therefore provide us with clues about our risks and help emergency managers and others with decisions related to emergency planning, analysis and prioritization of mitigation and preparedness activities. Generally, the disaster trends affecting the world community are in same fashion and we can describe as five major disaster trends. However, disaster affect the people, properties and environment of every country differently because the hazard profile, vulnerabilities, disaster management actions, and other factors that are unique to each country. So, the finer tunes of the trends are different for each countries. Methods: reviewing the disaster events of Myanmar from 1981 to 2018 and depending on the disaster trends, the hospital response systems improvement in Myanmar during these years will also be discussed. Results: Myanmar regularly experiences cyclones, storm surges, floods, landslides, earthquakes, drought and forest fires. over the last 15 years, Myanmar have been impacted by two major earthquakes, three severe cyclones, floods and other small scales hazards. Conclusions: In this paper, disaster trends of Myanmar in the 20th and 21st centuries will be compared and also the overview of recent natural disasters will be described. For every disaster, role of hospital is very important and quick effective collaborative hospital response system is one of the major parts of disaster management.

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PO_DIS_03_06

Experience of a Disaster Medical Assistance Team in a Hospital Fire: Lessons Learned From Disaster Response to a Burn Mass Casualty Incident

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Background and Objectives: A disaster in the hospital is particularly serious and quite different from other ordinary disasters. We aimed to analyze the activity outcomes of a disaster medical assistance team (DMAT) for disaster scene of fire at hospital. Methods: A cross-sectional observational study that analyzed the activity records at scene of hospital fire, retrospectively. The data was documented by a DMAT and 119 emergent medical technician, included information about the patient's characteristics, medical records, triage results, and the hospital transferred. Patients were categorized into four groups (Red, Yellow, Green, Black) according to results of field triage using the simple triage and rapid treatment (START) method. We assessed the adequacy of DMAT activity and the triage. Results: DMAT arrived on the scene 37 minutes after accidents occurred. 138 patients were evacuated from disaster scene. 25 patients (18.1%) in the Red group, and 96 (69.6%) patients in the Yellow group, 1 (0.7%) patient in the Green group, no one died. There were 16 (11.6%) of the medical staff and hospital employee. The transfer order was determined considering available medical resources and severity, and all patients were appropriately transferred to other hospitals. Conclusions: Hospital disasters show differences in how a disaster develops and the characteristics of casualties compared to ordinary disasters. For effective disaster-response system in this special situation, it is important to secure the safety of medical staff, to utilize available medical resources, to secure patients’ medical records, and to reorganize the DMAT dispatch system and its communication.

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Tips and Tricks so as Not to Fail in Critical Situations

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Background and Objectives: Critical situations in emergency medicine are almost inevitable. Not only young doctors can react with high anxiety or even panic, which is not good for them, the people around them or the patient. When people panic or become highly anxious, their fear replaces clear thinking. This can lead
to inaction, emotional and problematic decision-making and unnecessary distress. All of these interferes with an effective response, such as carefully gathering needed emergency supplies. Methods: CRM-Crisis resource management is a way of thinking and working with human resources in a crisis situation taken from aviation. Now it is widely used especially in emergency medicine. It is based on knowledge of non-technical skills. Non-technical skills are the cognitive and interpersonal skills that are the basis for effective teamwork. These include situational awareness, decision making, communication, teamwork and team leadership and task management. Results: Offers of advice give an overview of 13 simple tips and tricks based on Crisis Resource Management how to master the most difficult situation in acute medicine. It includes knowledge of the work environment, intentional interference of attention, communication, dynamic determination of priorities, calling for help, using mnemonic devices and a number of others. Conclusions: It was found that correct and effective usage of non-technical skills can lower mistakes made when examining a patient, raise the quality of pre-hospital urgent care, and also improve the prognosis and outcome of the patient.

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Assessment of the Need For Training in Specific Skills For Emergency Teams Based on CPR Competition

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Background and Objectives: Emergency teams should be constantly trained in cardiopulmonary resuscitation (CPR) for better survival of patients in cardiorespiratory arrest. Despite official training in ACLS and PALS, each service has specific training needs. We unprecedentedly assessed the need for training in specific skills for emergency teams based on CPR competition. Methods: Fifteen teams representing all emergency departments of Albert Einstein Hospital-Sao Paulo-Brazil were selected for a CPR competition and were divided into two groups: A) 8 teams for adult CPR, and B) 7 teams for child CPR. Each team consisted of 6 members (2 doctors, 2 nurses, 2 nursing technicians) and was with ACLS and PALS updated. The competition was in a simulation environment, with high fidelity robot and all necessary equipments available. All teams from each group attended the same case, they were blind to the scenario and to the attendance of the other teams. Five skills, each with multiples subitems and own judge, were evaluated: teamwork, basic life support, quality, advanced cardiac life support and care after CPR. Each team had a final grade ranging from zero to 100, with a strict punctuation system, including points discount on serious errors. The skills with the lowest scores will be reason for specific institutional training. Results: The teams of group A and group B had average final score respectively 34.8 (10-61) vs. 27.8 (6-48). Teamwork, basic life support and advanced life support during CPR performed well, with mean scores varying from 50 to 85% of the subitem score. Quality of CPR and post-PCR care had critical performance in all groups (0-30%), especially in the B group. Conclusions: The quality of CPR and post-PCR care were the skills with the greatest need for specific training, especially in pediatric care.

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A Multicenter Study Using Delphi Methodology to Determine Simulation Curriculum For Postgraduate Emergency Medicine

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Background and Objectives: There is increasing evidence to support the integration of simulation into medical training; however, no national emergency medicine (EM) simulation curriculum currently exists. Using Delphi methodology, we aimed to identify and establish content validity evidence for EM curricular content best suited for simulation-based training, to inform national postgraduate EM training. Methods: A national panel of experts in EM simulation-related education iteratively rated potential curricular topics, on a 4-point scale, to determine those best suited for simulation-based training. After each round, responses were analyzed and topics scoring <2/4 were removed. Remaining topics were sent to the panel for further ratings until consensus was achieved, defined as Cronbach α ≥ 0.95. At conclusion of the Delphi process, topics that were rated ≥ 3.5/4 were considered core curricular topics, while those rated 3.0-3.5 were considered extended curricular topics. Results: Forty-four experts from 13 Canadian centers participated. Two hundred and eighty potential curricular topics, in 29 domains, were generated from a systematic review of the literature, analysis of relevant educational documents and a survey of Delphi panelists. Three rounds of Delphi surveys were completed before consensus was achieved, with response rates ranging from 93-100%. Twenty-eight topics, in 8 domains, reached consensus as core curricular topics. An additional 35 topics, in 14 domains, reached consensus as extended curricular topics. Conclusions: Delphi methodology allowed for achievement of expert consensus and content validation of EM curricular content best suited for simulation-based training. These results provide a foundation for improved integration of simulation into postgraduate EM training and can be used to inform national simulation curriculum to supplement clinical training and optimize learning.

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Development of a New Questionnaire to Evaluate Physician’s Attitude Variation of Seeing Minor Emergency Disease Before and After Taking the Triage & Action Minor Emergency Course: a Pilot Study

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Background and Objectives: Triage & Action (T&A) minor emergency course aims to improve clinical skills of non-specialists in minor emergency problems in Japan. Although the course was evaluated by trainees with self-reported satisfaction. The aim of this study is to develop new questionnaire evaluating the impact of the course on actual clinical practice after the course. Methods: Questionnaire for actual clinical practice after course was developed by principal members of T&A minor emergency course and evaluated by all T&A minor emergency’s instructors. The questionnaire composed from total 32 questions stem from three major factors; physician’s experience, confidence of clinical skill, and number of patients after course. Evaluators responded to the questionnaire to evaluate contextual validation by clinical sensitivity test, followed by responding to the same questionnaire with two weeks interval to evaluate reliability. Results: Total 32 (31.1%) evaluators responded the first and the second questionnaires, and 28 (27.2%) evaluators answered clinical sensitivity test. All categorical questions had kappa value >0.6 and continuous questions did not show significant difference between the first and the second questionnaires. In the Clinical sensitivity test, 82.1% physicians answered “Fair to Large extent” for the question about perspicacity, and 92.8% physicians answered “Normal to Very Likely” for the question about “To elicited participant’s attitude”. Conclusions: We confirmed this questionnaire had high reliability and quality. We plan to start this questionnaire from 2019.

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A Decade of Lessons From an Emergency Medicine Exchange Program Between China and the USA

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Background and Objectives: International medical education exchanges are challenging to design and implement for many reasons. Because of differences in
health care systems, medical training programs, credentialing requirements, super- vision challenges, potential language and cultural barriers, and unequal relative economies, such programs are inherently difficult to start and even more so to maintain. This study analyzes the salient factors and outcomes of an international exchange program for emergency medicine physicians between mainland China and the USA.

Methods: To promote international exchange for emergency medicine physicians in the USA and mainland China, the authors started an exchange program in 2008 to enable physicians either in training or in early practice to spend 1-3 months rotating at their counterpart’s institution. To surmount the challenges noted above, the authors tested several different models over the course of a decade to adapt to changing norms, institutional configurations, and economic fluctuations. These models involved different funding mechanisms (donor funding, host hospitality, and self-pay).

Results: From 2008 to the present, over 30 physicians from 7 medical institutions have participated in the exchange program. In the first iteration, the U.S. hosting institution obtained funding from a private donor to support the exchange program, but after this funding expired, the program changed to a host hospitality model wherein the host institution would arrange and pay for expenses. This eventually changed to a modified self-pay model wherein the host would arrange lodging and the guest would pay. Conclusions: Progressively modifying the terms of the exchange program allowed it to continue over ten years promoting relationships, exchanging medical knowledge and sharing different clinical practice ideas between medical education communities in the USA and China.

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Enhancing Emergency Nursing Competencies through Technology Enhanced Learning with Flipped Classroom Application

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Background and Objectives: Technology enhanced learning (TEL) is increasingly considered an ideal approach within healthcare education. One of the best ways to implement TEL is to have students engaged in self-directed learning with multiple ways of feedback and evaluation. One such method is flipped classroom learning. The pedagogy of flipping speaks about student-centered focus and disruptive, but positive potential of a TEL experience. Therefore, the purpose of this study was to examine the applicability of a flipped learning course in emergency nursing for nursing students.

Methods: Total of 87 nursing students in their final 4th year participated in this study. The students were randomly divided into the traditional learning group and the intervention (flipped learning) group. The traditional learning group received classroom lecture first followed by scenario-based simulation. The intervention group were given time to self-study the lecture online before participating in this study. The students were randomly divided into the traditional learning group and the intervention (flipped learning) group. The traditional learning group received classroom lecture first followed by scenario-based simulation. The intervention group were given time to self-study the lecture online before participating in this study.

Conclusions: This study supports and confirms that the flipped learning can be a creative instructional model for TEL in emergency nursing curriculum to enhance students’ learning outcome.

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Detecting Latent Safety Threats in an Interprofessional Training that Combines in Situ Simulation with Task Training in an Emergency Department

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Background and Objectives: During in situ simulation, interprofessional care teams practice in an area where clinical care occurs. This study aimed to detect latent safety threats (LST) in a training program, which combined in situ simulation scenarios with just-in-time and just-in-place self-directed task training in an emergency department. We hypothesized this simulation-based training in actual care areas allows the detection of at least one LST per simulation scenario.

Methods: This prospective observational study (April 2015–March 2016) involved 135 physicians, nurses, and nurse technicians. Training themes selected were arrhythmia, respiratory insufficiency, shock, and cardiopulmonary resuscitation. Simulation weeks occurred every 3 months, with three 10-minute scheduled in situ simulation scenarios alternating for each theme daily. The scenarios were followed by co-debriefing by two facilitators (a physician and a nurse). LST were identified by facilitators using a debriefing checklist. Additionally, a room was set up with task-trainers related to each theme. Results: The number participants in scenarios was 114 (84% of the population) and in task-training, 101. The number of scenario cancellations was nine, making the final total number to 49 of 58 proposed. Fifty-six LST were observed, with an average of 1.1 per scenario. LST were divided into four categories: equipment (n = 23, 41.1%), teamwork (n = 12, 21.4%), medication (n = 11, 19.6%), and others (n = 10, 17.9%). There was a higher proportion in equipment-related LST (p < 0.01). Conclusions: The training allowed a high rate of detecting LST regardless of theme. Equipment-related LST were more frequently found.

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Team Based Learning Improves Knowledge and Retention in Emergency Medicine Clerkship

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Background and Objectives: Team Based Learning (TBL) is an instructional pedagogy that has been introduced in medical education relatively recently. It is increasingly recognized that TBL improves student engagement, value of teamwork and performance on standardized assessments when compared to traditional lecture based instruction. The aim of this study is to compare two educational modalities (TBL and didactic/course discussion) on knowledge-based outcome and student perceptions.

Methods: Two Emergency Medicine clerkship academic years were studied. In the first year, all topics were delivered via didactic presentations along with case discussions. In the second year, eight topics were delivered using TBL while three topics were delivered via didactic/course discussions. Final exam marks were compared. Student satisfaction survey was also conducted and analyzed.

Results: Student marks improved in second year for both TBL and didactic/course discussion topics. The average mark for topics taught via TBL in the second year is significantly higher than the average mark on the same topics taught didactically in the first year by 7.5% (T-test, p < 0.001). The marks of the topics taught via TBL showed better improvement comparing to the topics thought via didactic/course discussion by 2.3% (ANOVA Repeated Measures, p = 0.042). Student marks related to TBL topics were significantly higher on the medical student exam in second year (paired t-test, p = 0.007). Student response to TBL survey was positive.

Conclusions: TBL as part of a blended learning environment facilitated improved knowledge-based performance in an Emergency Medicine clerkship following end clerkship and medical school exit assessments, suggesting TBL stimulates long-term retention. This study contributes to the growing body of evidence suggesting effectiveness of TBL in achieving improved academic performance in the clinical years. The high acceptance of TBL among our students suggests a preference of this learning modality to didactic teaching.

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First Aid First-Medical Students Teaching First Aid in the Detroit Community

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Background and Objectives: The pedagogy of flipping speaks about student-centered focus and disruptive, but positive potential of a TEL experience. Therefore, the purpose of this study was to examine the applicability of a flipped learning course in emergency nursing for nursing students. The traditional learning group received classroom lecture first followed by scenario-based simulation. The intervention group were given time to self-study the lecture online before participating in this study. The students were randomly divided into the traditional learning group and the intervention (flipped learning) group. The traditional learning group received classroom lecture first followed by scenario-based simulation. The intervention group were given time to self-study the lecture online before participating in this study.

Conclusions: This study supports and confirms that the flipped learning can be a creative instructional model for TEL in emergency nursing curriculum to enhance students’ learning outcome.

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**Background and Objectives:** In 2017, medical students at Wayne State University School of Medicine (WSUM) created a first aid training initiative called First Aid First (FAF) under the supervision of faculty from the Department of Emergency Medicine. FAF is a comprehensive community-based training program that teaches lifesaving skills tailored to the Detroit community. The objective of this initiative was to improve the knowledge, confidence, and skills related to basic first aid of those who attend the training. The three-hour curriculum includes Hands-Only CPR, Stop-the-Bleed, chest pain, stroke, seizure, injuries, drowning and much more. **Methods:** A pre- and post-test survey was used to measure basic first aid knowledge, confidence and skill level of participants. The survey data gathered from twelve trainings between March-October 2018 consisted of 5 Likert scale questions for the self-evaluation component and 15 multiple choice questions. Due to changes in the curriculum, seven additional questions were added and 3 questions were modified for validation purposes in the two trainings in November and December 2018. **Results:** A total of 220 Detroit community members attended the fourteen FAF trainings. The average age was 41.16 and 29.8% had no previous first aid training. Using a Likert scale (1=strongly disagree and 5=strongly agree), participants stated that post-test they were more confident with responding to a medical emergency with 3.2 improving to 4.5/5 (p-value <0.001). Similarly, there were improvements in confidence in performing CPR from 3.0 to 4.6/5 (p-value <0.001). Pre- and post-test scores showed improvement as well with scores improving from 17.29-21.83 (p-value <0.001). **Conclusions:** The FAF has been effective in bringing first aid education to the Detroit community. Participants have reported increased self-efficacy and basic first aid knowledge. With more community members knowledgeable about first aid, more bystanders can respond to a medical emergency.

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**Assessment of the Effectiveness of Current Pediatric Emergency Medicine Education in Emergency Medicine Training Program—a National Survey**

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**Background and Objectives:** The evaluation of the effectiveness of pediatric emergency medicine (PEDI) education is essential to enhance emergency medicine (EM) residents’ knowledge, skill and confidence to treat acute pediatric visits in trauma and emergency clinical setting. We aim to evaluate current pediatric emergency education in EM training program and provide amendments. **Methods:** This was a non-anonymous questionnaire survey which was distributed by Taiwan Society of Emergency Medicine (TSEM)secretary as an online questionnaire. The questionnaire was developed by senior emergency physicians in the pediatric training working group of TSEM via consensus methods. A total of 1,310 emergency physicians and residents in 43 training programs were invited. The contents included demographic data, type of hospital, proctored trainers, assessors and settings in which pediatric patients are seen. Participants’ confidence for managing acute pediatric ED visits, satisfaction and reflection on pediatric emergency education are also explored. **Results:** Among the 258 responses were received. Participants included 117 residents and 141 attending physicians. About three-fourth reported working in medical centers. Rotations most often included general pediatric ward (2 months) and the emergency department (2 months) but lack of pediatric/newborn intensive care units. Proctoring was primarily performed by pediatric attendings and general EM attendings. Fifty-eight percent of participants felt satisfied for current pediatric emergency training. However, there are only 52.3% of participants felt confident in managing acute pediatric visits and inadequate pediatric patient exposure and lack of intensive care training/rotation were contributed factors. EM residents addressed lacking of confidence in managing newborns, infants or even clinical procedures, while simulation training and point-of-care ultrasound learning were expected. **Conclusions:** The pediatric emergency education in EM training program is diverse in intensive care training, proctors and assessor. Our surveys showed that inadequate pediatric patients exposure contributed to less confidence of EM learners. Further curriculum reform focus on pediatric intensive care training or procedure skills is needed. **Corresponding Author:** Yu-Che Chang (changyuche@gmail.com)

**PO_EDU_05_04**

**CPR Guidance by an Emergency Physician Via Video Call: a Simulation Study**

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**Background and Objectives:** In South Korea, the prehospital treatment of cardiac arrest is generally led by an emergency medical technician-paramedic (EMT-P), and defibrillation is delivered by the automatic external defibrillator (AED). This study aimed at examining the effects of direct medical guidance by an emergency physician through a video call that enabled prompt manual defibrillation. **Methods:** Two hundred eighty-eight paramedics based in Gyeonggi Province were studied for four months, from July to November 2015. The participants were divided into 96 teams, and the teams were randomly divided into either a conventional group using the AED or a video call guidance group using manual defibrillators, with 48 teams in each group. The time to first defibrillation, total hands-off time, and hands-off ratio were compared between the two groups. **Results:** The median value of the time to first defibrillation was significantly shorter in the video call guidance group (56 s) than in the conventional group (73 s) (p<0.001). The median value of the total hands-off time was also significantly shorter (228 vs. 285.5 s) (p<0.001), and the hands-off ratio, defined as the proportion of hands-off time out of the total CPR time, was significantly shorter in the video call guidance group (0.32 vs. 0.41) (p<0.001). **Conclusions:** Medical direction by video call enabled prompt manual defibrillation and significantly shortened the time required for first defibrillation, hands-off time and hands-off ratio in simulated cases of prehospital cardiac arrest. **Corresponding Author:** Seungmin Park (aukawa1@naver.com)

**PO_EDU_05_05**

**Are There Differences Between Student Performance on Examinations After Rotations at Tertiary and Non-tertiary Care Emergency Medicine Teaching Sites?**

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**Background and Objectives:** Undergraduate medical Emergency Medicine (EM) rotations are often completed at either tertiary care centres or regional community hospitals. While the latter offer students exposure to different practice settings and population needs, many students perceive that teaching at tertiary care EM departments is superior to that in community hospitals. At our institution, third year undergraduate medical students complete three-week EM rotation at either a tertiary centre or a community hospital. Students are required to pass a 40-question multiple-choice examination in order to successfully complete the rotation. We compared examination results from three cohorts of medical students to determine if there is a difference in academic performance between students trained in tertiary care centres and students trained in community hospitals. **Methods:** We reviewed examination scores from three consecutive cohorts of students. The examination is administered quarterly and a mix of old and new questions are used to ensure consistency. Students were divided into two groups, tertiary and community, based on the site of their EM rotation. Mean examination performance was compared between the two groups of students using two-tailed unpaired T tests. **Results:** Examination scores from 312 students were analyzed. Cohorts included 104, 100, and 108 students with the majority learning in tertiary centres (63%, 60%, and 61%, respectively). Mean examination scores from students at tertiary centres across all three cohorts ranged from 75.7% to 79.0%. Mean scores from students at community centres ranged from 77.4% to 77.7% over the same period. There was no significant difference in examination performance between students at tertiary and community centres in the first cohort (p=0.20), second cohort (p=0.44), or third cohort (p=0.42). **Conclusions:** Despite medical student perceptions of superior EM training in tertiary care centres, academic performance was similar between students trained in tertiary and community sites.

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**PO_EDU_05_06**

**The Impact of Sleep Quality on the Occupational Fatigue Outcome among Healthcare Shift Workers in Critical Care Setting, Hospital Universiti Sains Malaysia (HUSM)**
Background and Objectives: Occupation-related fatigue and sleep loss are common among shift workers in the emergency department (ED), who deliver round-the-clock critical care service to patients. These factors affect their performance and impose unnecessary hazard to patients. The study objectives are to estimate the prevalence of poor sleep quality and severe occupational fatigue, and to investigate the contributing factors of occupational fatigue among shift workers in ED.

Methods: This was a 6-month cross-sectional questionnaire-survey study conducted at ED, HUSM. Participants were asked to fill-in the self-administrated validated questionnaire. Quality of sleep and occupational fatigue were measured using Sleep Quality Index (SQI) and Checklist Indirect Strength (CIS-20R) questionnaire respectively. 116 respondents were recruited via simple random sampling technique, to achieve 5% precision in estimating the prevalence of occupational fatigue, which was 56.4% in previous study among similar population. Results: This study estimated that the prevalence of poor sleep quality among ED healthcare workers was 6%. The prevalence of severe occupational fatigue was about 21.5%. Logistic regression showed two independent factors that were significantly associated with, and fatigue outcome-type of profession (p = 0.032) and quality of sleep (p = 0.04). Professional healthcare staff are 9.6 times higher odds (AOR, 95% CI: 1.22–75.66) to have severe fatigue compared to supporting group. Those who did not have good sleep quality are 2.7 times higher odds (AOR, 95% CI: 1.04–7.15) to have severe fatigue. Conclusions: The low prevalence estimation of poor sleep quality and severe occupational fatigue in this study could invariably be limited by the sampling technique, which was done in one center, due to limited research funding, and the strong evidence between sleep deprivation and fatigue among shift workers, further research should be invested by policy makers to implement a circadian rhythm-friendly schedule, on top of improving their work environment.

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Team-based Learning Curricula in Point-of-Care Ultrasound Training For Undergraduate Medical Education

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Background and Objectives: The College of Medicine curriculum is composed of units dealing with a body-organ system in classroom and inpatient settings. The ultrasound Curricula in Point-of-Care Ultrasound (POCUS) training will follow other essential clinical skills of the same unit, like history taking and physical examination. This project applies to the respiratory units. Unlike traditional didactic lecture style, students of a TBL POCUS class will be held accountable for coming to class prepared. Instead of passively sitting in a classroom taking notes, students of a TBL POCUS class spend most of the lecture time actively engaging in team-based problem-solving activities as describe below. The responsibility of learning shifts from instructor to students. The purpose of this Team-based learning (TBL) instructional module is threefold: 1) to promote the use of POCUS as a bedside tool, 2) Identify the physical principles, artifacts and the steps for image optimization while performing ultrasound, and 3) Recognize the sonographic appearances of normal and abnormal structures required to answer common clinical questions.

Methods: The educational activity has several steps: (1) Students independently review online material describing the Respiratory POCUS physics, anatomy and a video demonstration. (2) Classroom activity begins with an individual multiple-choice test of 10 questions based on the advance assignment. Students use the Socrative application in their smart mobile to submit their answer selections. This assessment is the Individual Readiness Assurance Test. (3) Next, they team up (4-6 student per team). Within teams, they discuss the same set of multiple-choice questions and achieve a consensus on each question, submitting their answers and receiving immediate feedback by using a fresh version of the same test on the Socrative application. This assessment is the Team Readiness Assurance Test. (4) The instructor then engages the teams in discussions on those questions that the class found difficult and clarifies any misconceptions. This reinforces learning of the core content and concepts for the day. (5) Hands-on sessions on Standardized patients (SP) creating real life experience to assure proper image-acquisition and anatomy. Results: Results were that students and faculty rated the session as more positive on several items related to engagement, productivity, and skills development. Students valued the introduction to the technology and found sonoimage interpretation challenging, but not insurmountable. Students wanted more instruction on ultrasound physics, an expansion of ultrasound curriculum with same teaching method. Conclusions: The introduction of POCUS into anatomy teaching was successful, with staff and students responding positively to the experience. Using TBL helped increase the interest and the engagement during the session with positive feedback from both student and faculty. Prior evidence on TBL have shown that using TBL helped increase knowledge retention and problem solving when compared to traditional instructional methods.

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Intention Difference Between Healthcare-provider and Patients: A Qualitative Study Based on Emergency Room Experience

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Background and Objectives: Personal health records (PHR) defined as health records related to patient care that are controlled by the patient and PHR could be role for improving patients’ prognosis in emergency situation by sharing their information. The purpose of this study was to understand discrepancy of intention between healthcare provider (HCP) and patients in emergency room (ER). Methods: Mixed-method study based on interview was performed to find information needed for designing PHR for emergency medical system (EMS). We divided
EMS by three stages: Pre-hospital, In-hospital, and Inter-hospital. Interview for in-hospital stage with 49 patients and their caregivers who experienced ER one or more time and 21 ER physicians. Interview questionnaires included questions about desired information based on their ER experience as patient, caregiver, and physician. Interview were recorded and transcribed verbatim. We performed the secondary analysis with In-hospital dictation to attain our study purpose. Extract- ing keywords from dictation and compared frequency of keywords between HCP group and patient group. Results: We extracted 127 keywords in total 745 words from patients’ dictation and 161 keywords in 452 from HCP. Most common keyword from patient group was ‘Test result’. ‘Care process’ and ‘Information about ER system’ were following as second and third. Patients in ER have desire to know status of exam and unfamiliar ER environment. Otherwise, most common keyword from HCP group were ‘Past History’ and ‘Degree of Crowding’. ‘Care process’ and ‘Status of patient’ were second and third. This result could be interpreted that HCP wish to get information to help their work and simultaneously; inform crowding to patients or others. Conclusions: Patients and HCP have difference intention to utilize information through PHR that patients wish to know more about their status, while HCP desire to help their work and give notice the ER crowding.

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Determining Services and Contents Required For a Personal Health Record in the Emergency Medicine: a Mixed Method Study

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Background and Objectives: With rapidly advancing mobile technologies and help from the hospital information system, a Personal Health Record (PHR) has emerged as a novel method of integrating health services. Also, it has been described that PHRs may play helpful for emergency patients by facilitating treatments and reducing errors. In this study, we tried to determine services and contents which should be considered in a PHR for the emergency medicine. Methods: This study is a part of the Korean government’s project called “Connected PHR for Emergency”. A mixed-method was used: in-depth interviews followed by structured surveys. First, the in-depth interviews were carried out by four trained interviewers (two nurses, one paramedic, and one health information manager). Emergency physicians, nurses, paramedics, patients, and their families were interviewed. After the interview, experts of medical informatics and emergency medicine analyzed the scripts and designed survey forms to validate results from interviews. The expert group created three types of surveys, which included desired services, contents, and the value of an emergency PHR for physicians, paramedics and patients. Results: The study took place from June 1st, 2018 to November 30th, 2018. Ninety three interviews were done to 21 emergency department staffs, 18 prehospital paramedics, 10 transfer coordinators, and 44 patients. Surveys were received from 100 patients, 51 paramedics, and 51 emergency physicians. Both interviews and surveys showed that there are very high-level of demands on PHR in emergency medicine, while there are significant discrepancies among groups that which way the system should be aimed at. Majority of subjects had agreed to share date for the system both in clinical and academic purpose.

Conclusions: Patients that which way the system should be aimed at. Majority of subjects had agreed to share date for the system both in clinical and academic purpose.

Conclusions: Patients and HCP have difference intention to utilize information through PHR that patients wish to know more about their status, while HCP desire to help their work and give notice the ER crowding.

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Video Call-assisted Advanced Life Support

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Background and Objectives: This study aimed to evaluate what make an improvement in good cerebral performance category (CPC) in out-of-hospital cardiac arrest (OHCA) patients resuscitated through the pilot project called Smartphone video call-assisted Advanced Life Support (SALS). Methods: This study was conducted with a controlled trial from August 2015 to December 2016. OHCA patients over 18 years of age, excluding trauma, poisoning, family’s refusal and do not attempt resuscitation were included. We divided SALS groups according to the CPC score (higher CPC group (HPC) vs. lower CPC group (LPC)). We analyzed patients’ characteristics, the prehospital performances of emergency medical service teams, the time intervals collected through prehospital resuscitations, and in-hospital treatments between two groups. Results: 2,536 OHCA patients were enrolled in the SALS group. 3 committees were categorized into HPC (n=1,302) and others were LPC (4 committees, n=1,234). Age of HCPC was younger than LCPC (p=0.013). There were no differences in prehospital performances (dispatcher recognition, bystander chest compression, shockable rhythm, Utstein cardiac arrest patients, no flow time to EMS resuscitation, time to IV access, and time to epinephrine). More patients were achieved the ROSC at emergency room in HPC (8.6% vs. 6.4%, respectively, p=0.014). Therapeutic procedures targeted to post-resuscitation care were performed more higher rate in HCPC patients (therapeutic hypothermia: 7.2% vs. 3.3%, p=0.001; extracorporeal membrane oxygenation: 2.8% vs. 1.0%, p=0.001, respectively). Rate of CPC 1,2 in HCPC was 7.8% compared to 4.9% in LPC (p=0.003). Survival admission and survival discharge rates were also higher in HCPC (21.0% vs. 16.6%, p=0.005, 10.7% vs. 8.4%, p=0.03, respectively). Conclusions: In our study, pre-hospital performances performed by EMS did not influence to the good neurologic outcome of survivors. In hospital efforts for improving neurologic outcome in OHCA patients were more important to reach to good CPC.

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Precise Images For Exceptional Decision Making

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Background and Objectives: The advent of electronic notes throughout emergency departments have removed the ability by clinicians who previously were able to sketch their relevant clinical findings onto paper charts. Through the use of digital photography these primitive and often inaccurate sketches or descriptions have been replaced with precise images detailing the nature of the injury or infection. However, the uploading of these images in the past has been technically challenging, with restricted access to digital cameras as well as a cable connection to upload images resulting in little use of images in the electronic medical records. We have through the use of individual smart phones of treating clinicians been able to increase the uptake of digital photography and transferring of these images to the medical records via the wireless internet securely onto the patient’s electronic medical folder. Methods: A prospective study at an outer suburban Melbourne metropolitan hospital which is part of the largest geographical area health network in Victoria whereby digital photographic images of patients presenting pathology are uploaded onto a secure Health Network electronic patient record wirelessly. Results: Images were uploaded in 75 cases over a 3-month period. The majority of cases, 40 (54%), were related plastic surgery resulting in a change of disposi-
tion in 30 (75%) of these cases which were transferred out for definitive surgical repair t. The remainder of the cases were cellulitis (20%), burns (16%) and a varied dermatological condition all of which both the progress and if required the consultation with tertiary units (both located off site) made the management of cases more precise. Conclusions: The ability to take accurate photographic images of complex conditions and transmit via a secure electronic patient record resulted
Electronic Medical Record Error in Reported Time of Discharge: a Prospective Analysis at a Tertiary Care Hospital in Qatar

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Background and Objectives: The Time of Discharge (TOD) is used at the study center and other Emergency Departments (ED) around the world to calculate patient’s length of stay (LOS). However, there is little evidence addressing the accuracy of this important reporting parameter. Any inaccuracies in TOD could have substantial effects on the reported LOS information for the ED. This can further impact surveillance of the ED Operations performance. Objectives: To evaluate the accuracy of Electronic Medical Record (EMR) reporting of patient’s LOS. To characterize the presence, direction, and magnitude of difference between TOD-EMR and actual patient discharge times (TOD-RA). To assess for any patient or ED-related variables associated with significant errors in TOD-EMR (>5 min).

Methods: A prospective non-interventional study was designed where Research Associates observed time of discharge (TOD-RA) in different areas of the ED at Hamad General Hospital. It involved convenience sampling and had no patient interaction. Canadian Triage Acuity Scale (CTAS) was applied on registration and CTAS 3–4 patients were included. A total of 184 cases were noted between August 2017–January 2018. The study center uses First Net Millennium EMR (Corner Corporation, Kansas City, Missouri USA). Results: Substantial errors were noted in discharge time reported in the hospital’s EMR. 57% of cases had ≥5 minutes in error of Time of Discharge. Incorrect discharge times lead to incorrect LOS tracking. From these, 89.5% errors were biased towards overestimation of LOS. No patient- or operations-related factors were predictive of operationally significant TOD-EMR error.

Conclusions: Understanding presence, direction, and degree of EMR time-interval errors improves the ability to follow ED operations. A suggestion for any ED using EMR indicators for operations: Check the accuracy of the data. Further study is warranted to assure that the precision of EMR-reported times is matched by acceptable accuracy.

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Comparisons of Some Machine Learning Models in Prediction of Appendicitis For the Emergency Physician

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Background and Objectives: For an emergency physician, because of the cost and risk of using abdominal computed tomography (CT), it is a critical decision making whether the arrangement of abdominal CT for the diagnosis of appendicitis is appropriate. Some proposed machine learning models were constructed in the past for the patients who were already under the clinical suspect of appendicitis. In this study, we focus on all patients who visited the emergency department (ED) and accepted abdominal CT examination. Our proposed machine learning models can be more widely applied. From the simulation result, it is found that the generalized partially linear model with deep learning is a good choice for our binary classification appendicitis problem.

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Safety of Discharge in Elderly Patients with Abdominal Pain: an Emergency Department Quality Improvement Project

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Background and Objectives: Abdominal pain is difficult to diagnose in the elderly population. They are more likely to have serious underlying pathology and decreased physiological reserve when compared to younger patients. RCEM have recognised this group as being at risk and advise all should be seen by a senior clinician (ST4+) before discharge home. A national audit and a serious incident in our Emergency Department (ED) prompted a review of our management of this patient cohort. Our aim is to assess the safety of discharges of this cohort and implement sound procedural change to promote patient safety.

Methods: All patients presenting with abdominal pain and >70 years old were included. Outcomes investigated included involvement of senior clinician in discharges and adverse events following discharge. We studied patients presenting in November–December 2017 and then educated staff and implemented new alert systems on ED software and on paper notes. We later performed two repeat audits in June/July 2018 and September/October 2018. Further study involved reviewing the outcome of patients presenting January–June 2018 with flank pain or constipation.

Results: 89 cases were included in November/December 2018 of whom 59% were seen by a senior clinician prior to discharge (compared to 25% in the RCEM audit 2016/17). There were no serious adverse outcomes in these patients or related re-attendance. Following our intervention, 100% (n=17) of discharged patients were seen by ST4+ doctor in June/July (n=17) and 88.24% in Sept/Oct 2018 (n=41). 69.23% of elderly patients presenting with flank pain or constipation were discharged with senior involvement between (N=38).

Conclusions: We have successfully introduced a simple, effective alert system to prompt senior review of at-risk group of patients. Repeat auditing has shown a significant improvement in standards. Further safety improvement will be the addition of alert system to encompass all potential serious abdominal pathology in the elderly.

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Status of Emergency Signal Functions in Myanmar Hospitals: a Cross-sectional Survey

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Background and Objectives: Large portion of mortality and morbidity from non-communicable diseases including trauma is accountable to developing countries. Establishment and development of emergency medical system is crucial for reduction of this burden. Defining gaps of resource and capacity in emergency medical system in developing countries is crucial for proper designing and operation of Emergency Medical Services (EMS) reinforcement program. Myanmar has peculiar challenges of road access for providing timely emergency medical care, while a similar shortage of trained health workers such as other developing countries. To clarify the EMS capacity in Myanmar we applied Emergency Care Assessment Tool (ECAT), which newly developed tools for assessing sentinel condition and signal function in emergency care facilities. Methods: ECAT composed of 6 emergent sentinel conditions and corresponding signal functions. Total 5 hospitals were surveyed. Further study involved reviewing the outcome of patients presenting January–June 2018 with flank pain or constipation. Results: 89 cases were included in November/December 2018 of whom 59% were seen by a senior clinician prior to discharge (compared to 25% in the RCEM audit 2016/17). There were no serious adverse outcomes in these patients or related re-attendance. Following our intervention, 100% (n=17) of discharged patients were seen by ST4+ doctor in June/July (n=17) and 88.24% in Sept/Oct 2018 (n=41). 69.23% of elderly patients presenting with flank pain or constipation were discharged with senior involvement between (N=38).

Conclusions: We have successfully introduced a simple, effective alert system to prompt senior review of at-risk group of patients. Repeat auditing has shown a significant improvement in standards. Further safety improvement will be the addition of alert system to encompass all potential serious abdominal pathology in the elderly.

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International Rotational Program of Emergency Medicine Residents to Mozambique; Introducing Medical Education Program to a Single Hospital

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Background and Objectives: There are several medical elective programs for low-income country especially in medically vulnerable places. The hospital central de Queimilane (HCQ) is a regional hospital in Queimilane, capital city of the province Zambezia in Mozambique. Four emergency medicine (EM) residents participated in our rotational program from 2017 to 2018 for the HCQ, to share medical knowledge with the local medical doctors and support the demands of medical equipment skills and educational programs. Methods: We figured out the current capabilities of the HCQ and designed our rotational program in accordance with the demands in following areas such as resuscitation, trauma, critical care and radiology, since the HCQ serves as regional base hospital for emergent and severe patients. We also introduced continuous education programs and administrative methods for future development of education. Results: Throughout the four rotations of our EM residents, we conducted daily education and several practical lessons based on the demands of the local doctors and equipment operation. The education was administrated by educational administrator who is responsible for keeping medical and technical knowledge of doctors. With our education programs, the doctors of HCQ were able to perform resuscitation and critical protocols, including manipulating equipment such as mechanical ventilator and defibrillator. Conclusions: The rotation program by four residents were successful, in terms of sharing medical knowledge and equipment managements, and filling gaps identified in operation of modern hospital.

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The Evaluation of Uzbekistan’s Ambulance Staff’s Medical Knowledge and Capability to Make Clinical Decision

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Background and Objectives: In Tashkent, the ambulance staffs are comprised of various healthcare workers such as, general physicians,feldshers, and nurses. The education system of the ambulance staff is as follows; general physicians should have completed three years of college or lyceum (such as vocational-technical school) and seven years of medical school curriculum. Methods: In cooperation with the Ministry of Health of Uzbekistan, we collected data about the staffs working at an ambulance station in Tashkent city, as an ambulance staff, dispatcher or medical director. A survey was conducted to identify the personal data, emergency medical equipment and clinical experiences of the related personnel.

Results: The participants answered that the experience and confidence of skills related to basic airway management such as oxygen supply, airway maneuvers and bag mask ventilation were over 60 percent. However, the experience and confidence level related to techniques related advanced airway and breathing support like endotracheal intubation, surgical airway and needle decompression were as low as 22 to 38 percent. Conclusions: The ambulance staff in Tashkent, Uzbekistan found to have insufficient medical knowledge and clinical decision-making abilities.

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A Scoping Review on Patient Race, Ethnicity and Care in the Emergency Department

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Background and Objectives: Health disparities between racial and ethnic groups have been documented in Canada, the United States, and Australia. Despite evidence that differences in emergency department (ED) care based on patient race and ethnicity exist, there is a lack of scientific reviews. The objective of this review is to provide an overview of the literature on the impact of patient race and ethnicity on ED care.

Methods: A scoping review guided by an established framework was undertaken. This approach was best suited to the goal of providing an overview of all of the literature. Primary outcomes considered included triage scores, wait times, analgesia, diagnostic testing, treatment, leaving without being seen, and patient experiences. Literature came from Canada, the United States, Australia, and New Zealand. A database search protocol was developed iteratively. Inclusion and exclusion decisions were made using an established model.

Results: The original search yielded 1,157 citations, reduced to 453 after duplicate removal. 153 full texts were screened, of which 85 were included for data extraction. Results indicate there is evidence that minority racial and ethnic groups experience disparities in triage scores, wait times, analgesia, treatment, diagnostic procedure utilization, leaving without being seen, and subjective experiences. Authors’ suggested explanations for these disparities can be placed in categories: (1) communication differences; (2) conscious or unconscious bias; (3) facility and resource factors in hospitals with higher minority presentation rates; and (4) differences in clinical presentations.

Conclusions: This scoping review provides an overview of the literature on the impacts of race and ethnicity on ED care. As disparities have been shown to exist in numerous contexts, further research on the impact of race and ethnicity in ED care is warranted. Such explorations could aid in the informing and creation of policy and guide practice.

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Bullying and Harassment in the Workplace

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Background and Objectives: There have been increasing allegations of bullying and harassment in the UK healthcare sector over the past few years. Previously junior doctors would just put up with undermining and bullying behaviours from senior staff, particularly in stereotypically ‘macho’ specialties like surgery and emergency medicine. Nowadays, however, following changes in medical training and increasing legal protection (in the form of statutes) afforded to workers, staff are far more likely to raise concerns about bullying and harassment behaviour. My aim in this paper is to explain the extent of statutory protection afforded to workers suffering harassment and bullying, and to consider whether the law has developed in such a way as to place an unfair burden on the employer.


Results: In addition to being responsible for their own conduct, an employer must take responsibility for the conduct of all of their employees, and sometimes that of a third party.

Conclusions: In my opinion, the current statutory protection afforded to workers is adequate, but the law has not kept up with the development of new types of bullying and harassment behaviours. The law is an imperfect protection for workers suffering harassment and bullying. To be effective, it must be supplemented by better training and education in this area.

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Emergency Physicians’ Experiences and Perceptions about Unprofessional Behaviors

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Background and Objectives: Medical professionalism is one of important tenet of
medical practice, although consensus on its definition was lacking. Also, there is a lack of interest in medical professionalism in Korean undergraduate and postgraduate education. In particular, emergency physicians need a better understanding of medical professionalism, because they are often confronted with situations where they need to make quick decisions even if crowded. Therefore, we investigate the current concept about medical professionalism of emergency physicians. Methods: We surveyed the emergency physicians from 28 university hospitals in Korea in 2018. Emergency physicians queried on two issues: their experiences and perception of the 45 unprofessional specified behaviors. All items were compared according to gender and position. Results: A total of 253 (46.2%) emergency physicians responded among 548 emergency physicians. Among them, 212 (83.8%) were male, and 117 (46.2%) were females. The top of unprofessional behavior queries between positions was the same; ‘used drugs or opiates regardless of ncliens’, and follows; ‘contacted body parts is not necessary for the examination’. There were differences in the perceptions of specified behavior at only 1 query; and in the participations at 6 queries between genders. Female were more likely to experience in unprofessional behaviors than male. However, there were several significant differences in both the perceptions and observation and/or involvement in those behaviors between positions. Residents tend to be more sensitive to unprofessional behavior than faculties. Conclusions: There was a difference in perception and experience of unprofessional behavior according to gender and position. Education for medical professionalism is constantly needed, and recognition of unprofessional behaviors may be the first step for professionalism.

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A Case of Air Embolism by Intravenous Access; Error Disclosure

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Background and Objectives: It is inevitable that medical errors occur because medical services are performed by human. There is a gap between disclosing medical errors and practice. And if the error is trivial enough to be harmless, there will be a dilemma as to whether to reveal it. However, the communication about medical errors is the core of the patient safety. Methods: This report is about the process of decision making from harmless medical error to the patient. The case was collected from emergency department in Korea. Results: A 46 aged woman came to the emergency department with driver’s traffic accident. She didn’t have medical and surgical past history. She complained posterior neck pain with tingling sensation on left arm. So, intravenous ketorolac through left arm was administered for relieving her symptoms. And cervical spine computerized tomography (CT) was performed for ruling out simple sprain or ossification of posterior longitudinal liga ment. There are no active lesions of cervical spine on CT, however, there is an air embolism sized about 1 cm on left internal jugular vein. (Figure 1, 2) The origin of air embolism was thought by intravenous access, because she didn’t have recent surgical & medical history and air embolism was located in left side which is same side of intravenous access. So, the attending emergency physician informed her of the known and suspected circumstances about the cause of air embolism. Hyperbaric oxygen therapy was performed. The patient was informed of the possible adverse events and discharged. Conclusions: There is always a dilemma as to how to disclose medical errors to the patients. However, if situation of medical error can be solved wisely, it help medical providers to honor their professional obligations and their patients. The communication about medical error is one of the most complicated and hard conversations in hospital.

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Interest of Physicians in Low- and Middle-income Countries For International Medical Volunteers

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Background and Objectives: International medical volunteers (IMVs) positively and negatively impact host countries (1) (2) (3) (4) (5), and the goals of their trips may not always align with the interests of the host physicians in lower- and middle-income countries. Although IMVs have published a plethora of data about their experiences (3) (4), little is known about what local health care workers actually want and need from IMVs. We sought to better understand local physicians’ interest of hosting IMVs and what type of support they desired. Methods: This study was a convenience sample survey-based needs assessment translated into English, French, Spanish, and Arabic. The surveys were distributed to local physicians by 28 professional society groups in low- and middle-income countries, as defined by the World Bank (6). Results: A total of 102 physicians from 51 countries completed the survey in English (69), Spanish (28), French (4), and Arabic (1). Represented specialties included emergency medicine (EM), surgery, obstetrics and gynecology (OB/GYN), internal medicine, pediatrics, surgical subspecialties, critical care, trauma, and pathology. Despite <50% participants having experience with IMVs, 75% were interested in hosting them. Host physicians most desired clinical education and research collaboration, with most wanting physicians (90%), nurses (11%), and engineers (3%). The most requested specialties were OB/GYN (24%) and EM (11%). Respondents considered public hospitals (62%) to be the most helpful clinical setting in which IMV's could work, and three months (47%) as the ideal length of stay. Responding physicians indicated that the following were important: obtaining a local medical license (53%), bringing medical equipment (47%), speaking the local language (46%), and having cultural sensitivity (46%). Respondents expressed interest in advertising the specific needs of the host country to potential IMVs (80%). Conclusions: This study provides the first step in elucidating what host physicians desire from IMVs.

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Restrictive vs. Liberal Approach For Blood Transfusion in Adult Patients with Upper GI Bleeds Presenting to ED and the Mortality Difference: a Systematic Review

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Background and Objectives: Blood or blood product transfusion is commonly used in the management of massive acute upper gastrointestinal bleeding. However, studies suggest that there is an increased risk of mortality and adverse events associated with a liberal approach for blood transfusion. The objective of this systematic review was to compare restrictive blood transfusion (i.e. hemoglobin maintained at a lower level) with liberal blood transfusion strategy (i.e. hemoglobin maintained at a higher level) in improving mortality amongst patients with acute upper GI bleeding. Methods: A literature search was carried out including Medline, Cochrane Library, and google scholar. The inclusion criteria were RCTs or observational cohort studies, including adult patients, presenting to ED with acute upper GI bleed, and requiring blood transfusion initiated in the ED. The primary outcome was to look into the mortality difference. Studies not comparing restrictive vs. liberal transfusion strategies were excluded from the review. Results: A total of 463 relevant articles were found, of those 5 articles met the inclusion criteria. Among the studies included in this review, there were three randomized control trials with a total number of 1,907 patients showed improved mortality when a restrictive strategy was used. Pooled data of two recent observational studies showed improved mortality with restrictive strategy. Conclusions: This systematic review found that a restrictive strategy is safer than the liberal strategy for blood transfusion in acute upper gastrointestinal bleeding. However, results may not be generalizable to all patients with acute upper gastrointestinal bleeding, for e.g., patients with massive haemorrhage and patients with comorbidities, for whom decision to transfuse should be based on clinical judgment.

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Variation in Head Computed Tomography Use For Paediatric Head Injury Across Different Types of Emergency Departments: Do We Have a Problem?

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Background and Objectives: Computed tomography of the brain (CTB) for paediatric head injury is used at low rates at tertiary paediatric Emergency Departments (EDs) in Australia and New Zealand. However, most paediatric patients are seen
SuPAR Predictive of Incident Dialysis and Mortality in Acutely Admitted Medical Patients with Prior History of Kidney Disease

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Background and Objectives: Acutely admitted medical patients with prior history of kidney disease (KD) are at increased risk of dialysis and death. Our objective was to determine whether plasma soluble urokinase plasminogen activator receptor (suPAR) measured at hospital admission can predict progression of KD to dialysis or death. Methods: SuPAR was measured in 28,728 acute medical patients admitted to the emergency department from November 2013 to March 2017 and were followed for disease development (ICD-10 codes) and mortality until June 2017, with median follow-up of 2 years (range 90-1,318 days). Patients with prior dialysis or kidney transplant were excluded. Association of suPAR with incident dialysis or mortality was determined by Cox regression adjusted for age, sex, CRP, and eGFR. Results: In total, 28,728 patients were admitted during the study. Among patients with a prior history of KD (n=3,019), 89 (2.9%) received dialysis and 867 (28.7%) died during follow-up. Patients with prior KD had median suPAR of 3.8 ng/mL (IQR: 2.5-5.9) vs. 2.8 ng/mL (IQR: 2.0-4.1) for those without prior KD (p<0.001). Patients with prior KD who received dialysis had median suPAR of 7.4 ng/mL (IQR: 5.2-9.7) vs. 3.7 ng/mL (IQR: 2.5-5.8) for those who did not receive dialysis (p<0.001). In patients with prior KD, a doubling in suPAR was associated with an adjusted hazard ratio of 1.89 (95% CI: 1.69-2.11) for receiving dialysis and 1.89 (95% CI: 1.70-2.10) for mortality. Conclusions: In acute medical patients with prior KD, suPAR was elevated, and those with the highest suPAR were more likely to require dialysis and had increased risk of mortality during a median of 2-year follow-up. These findings highlight the prognostic value of suPAR in kidney disease and its potential to be used in combination with GFR and proteinuria to monitor and prevent the progression of kidney disease.

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Visual Acuity Is the Missing Tool in the Assessment of Ophthalmic Emergencies in Emergency Department!

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Background and Objectives: We aimed to evaluate the measurement of visual acuity in cases presented to emergency department with ophthalmic emergencies. Methods: Baseline measurement: This was a retrospective study; we collected data about patients presented with visual complaints to the emergency department of Hamad General Hospital, Between June to August 2014. A total of 1,245 cases presented with eye complaints, Male were 73.5% (n=915) and female were 26.5% (n=330). With the age range of 16-40 years. The majority of cases presented were diagnosed as an infection followed by foreign body, 31.2% and 24.7% respectively. The most common reason for not doing the visual acuity was the unavailability of Snellen chart and lack of time. Intervention: We contacted the stakeholders to ensure the availability of snellen charts in different clinical areas and we conducted multiple educational activities to health care providers in the department. Results: post-intervention measurement: The post-intervention data were measured using the same initial method at May and June 2015. In this cycle a total of 307 patients, male to female percent was 84%, 16% respectively. With the age range of 16-40 years. Visual acuity had been recorded in on 55% (n=169) of cases. Conclusions: Visual acuity is an important part of visual complaints assessment, we have dramatic improvement in assessing the visual acuity. However, further interventions, for example continuous education, is recommended to maintain this improvements over a long term basis, this meets the nature of quality improvement projects which require a frequent reviewing to ensure delivering the maximal efficacy and outcome.

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When Both of Your Curtains are Down

Dr Siti Nasrina Yahaya Dr Siti Nasrina Yahaya

Background and Objectives: Acute vision loss is one of the commonest presenting complaint that brings a patient to the emergency department. Herein, we present a case of a teenage girl that presented with binocular vision loss who was diagnosed
as Vogt-koyanagi-harada disease (VKHD). Methods: 19 years old, female, previ-
ously well presented with binocular blurring of vision and orbital pain for one
week. No other significant history was obtained. On examination she appeared
alert. CNS and systemic examinations were unremarkable. Extraocular move-
ments were normal with marked reduction of visual acuity. Bilateral eye intrac-
uclear pressure is normal with clear lens. Fundus examination revealed macular ede-
ma, exudative retinal detachment and hyperemic, swollen optic discs. In view of
normal blood investigations including connective tissue disorder markers, VKHD
was diagnosed. She responded well to steroid therapy. Results: VKHD is a rare
granulomatous inflammatory disease that affects primarily pigmented structures
such as eye, hair, meninges and skin which occurs in the absence of ocular trauma
or eye infection that affects individuals with pigmented skin such as Asians.
VKHD has an acute onset of bilateral visual impairment with headache, uveitic
stage, which presents with bilateral panuveitis and exudative retinal detachment
which occurred in our case. A prompt treatment with high-dose corticosteroid
is linked to good prognostication of the disease. Conclusions: Acute bilateral vision
loss is vital to be approached in a systematic manner to identify the cause it has to
be taken seriously. Other common causes of vision loss such as bilateral glauco-
ma, optic neuritis, anterior ischaemic optic neuropathy, corneal ulcers and vascu-
laritis should be evaluated before this diagnosis is made.

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Vitamin D Status of Homeless Patients in the Emergency Department
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Background and Objectives: Vitamin D deficiency is common worldwide, and is
related with many kinds of disease. Although nutritional problem is a major con-
cern for the homeless, the vitamin D status of those has not been evaluated. We
undertook the present study in order to determine the incidence of vitamin D defi-
ciency among the homeless people admitted to an emergency department (ED).
Methods: This study was a retrospective chart review conducted at a single aca-
demic, urban public hospital ED. Electronic medical-record data from July 2014
to June 2015 were reviewed. Patients whose blood levels of Vitamin D had been
checked in the ED were enrolled. For the healthy settled civilian control, 2011
to 2012 data from the Fifth Korean National Health and Nutrition Examination
Survey (KNHANES) were used. Results: A Total of 179 patients were enrolled.
Vitamin D deficiency was observed in 133 patients (73.7%). The Vitamin D defi-
ciency group showed lower hemoglobin level group (13.4 [12.2-14.8] ng/mL)
than that of non-vitamin D deficiency group (14.3 [12.9-15.7] ng/mL) (p=0.018).
Winter visits were more common among the deficiency group (p=0.048). Rhab-
dodermatolysis was observed only in the deficiency homeless group (p=0.026).
A multivariate analysis showed that winter/spring visitation (odds ratio 4.85, 95%
Confidence interval 1.38-17.01) was related to vitamin D deficiency. When using
age and sex as covariate of propensity score matching, vitamin D levels were
lower in the homeless than in the healthy control (p<0.001). Conclusions: Vitamin
D deficiency was common among homeless patients. After adjusting for age and
sex, the vitamin D levels of the homeless were lower than those of healthy con-
trols.

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Improving Safety of Inter-hospital Transfers From a Secondary to a
Tertiary Hospital
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Background and Objectives: Alexandra Hospital was set up in June 2018. During
the setup phase of Alexandra Hospital, cases requiring surgical interventions or
acute medical emergencies (ST-elevation MIs, acute strokes, endoscopies etc.) are
transferred to a tertiary hospital. The acuity of patients requiring transfer vary, ne-
cessitating different levels of medical staffing and equipping. Guidelines were es-
established to standardise staffing and equipping for all outbound transfers from
Alexandra Hospital to the tertiary hospital. Cases were audited to ensure adherence
to guidelines and safety of transfers. Methods: The National Early Warning Score
(NEWS) 2 score was utilised to standardise the assessment of patient’s degree of
illness. Based on the NEWS2 score, patients were categorised into low, medium
or high clinical risk. Each risk classification required different medical staffing
and equipping during transfers. A transport checklist was utilised for each inter-
hospital transfer. In additional to the NEWS2 score for clinical risk stratification,
clinicians were asked to identify potential pitfalls (Airway, Breathing, Circulation,
Disability, Equipment, Environment) during transfer and prepare for them accord-
ingly prior to transfer. A senior clinician was required to vet the transport checklist
prior to transfer of patients. Results: Over the five months of operation (tilt No-
ember 2018), the transfer of patients to the tertiary centre did not result in signifi-
cant adverse outcomes. Conclusions: The transport checklist helped to standardise
the inter-hospital transfer process. Together with audits and continual education of
staff with regards to its utilisation, the inter-hospital transfer of patients is rendered
much safer. Challenges faced include inclusion of this process, especially dur-
ing emergencies.

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Clinical Epidemiology of Presentations to Multiple Australian
Emergency Departments—the One Day in Emergency Study 2.0
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Background and Objectives: The One Day in Emergency Study 2.0 (ODE 2.0) in-
volved the collection and linkage of clinical and administrative data from all pa-
tients presenting to all emergency departments (ED) in the South Western Sydney
Local Health District (SWSLHD) over a 24-hour period. This study was an ex-
tension of ODE 1.0 which collected data at Liverpool Hospital ED alone. Meth-
ods: Our methods involved the collection and linkage of manually recorded data
with electronic data captured by Cerner FirstNet2, to encapsulate a comprehen-
sive description of each patient. Collaboration with medical and nursing staff at
other hospitals was crucial to ensure the correct data was collected across the
same 24-hour period. These linked data were then analysed, focusing on signifi-
cant events times for the presenting patients. Results: Patients presenting to Liver-
pool, Bowral, Bankstown, Camden/Campbelltown, and Fairfield Hospital EDs
were analysed, resulting in a total patient pool of 831 patients, 50.2% female and
49.8% male. Age distribution skewed towards a younger age group of 0-24 years
of age, with a median of 36.2 years. Median time spent in the ED by a patient was
3.5 hours, median treatment time was 3.1 hours, and an inherent lag was seen be-
tween discharge ready time to the time the patients left the ED, with a maximum
time observed at Liverpool and Campbelltown of 5.1 hours and 5.5 hours respec-
tively, representing delay from “decision to admit” to “time left ED”. Conclusions:
Movement to EMR2 aided our data collection, ensuring that a large patient popu-
lation was able to be feasibly analysed. An opportunity cost of excessive bed oc-
cupation in the ED was observed in the busiest hospitals, Liverpool and Camp-
belltown, and opportunities exist for innovative insight into admission processes,
however further evolution towards electronic storage of data for extraction and
analysis needs to be implemented to effectively research this area.

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Point Prevalence Epidemiology of Presentations to an Australian
Emergency Department—the One Day in Emergency Study
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Background and Objectives: Emergency departments (EDs) are under pressure
to respond to increases in demand, but also to provide effective care whilst enduring
overcrowding, ramping and access-block. We do not routinely perform clinical
observations, using a point-prevalence design, and including all ED patients, with no
exclusion criteria, over a 24-hour period. Data were probabilistically linked into a
standardized, secure, online-database. Results: We identified 43.6% as Culturally and Linguistically Diverse (CALD) patients, surpassing the NSW average of 25.9%; these patients had a longer ED Length Of Stay (LOS) than non-CALD patients. Trauma was the most common presentation among patients within the 20-24 age group and pain was the most common presenting complaint overall, and chest pain accounted for 10% of presentations. 16 patients needed resuscitation, with dyspnoea, palpitations, and chest pain as the most common presenting complaints. Fluid resuscitation produced an increase in median mean arterial pressure and a decrease in heart rate across our patients at 1 hour post-bolus, but these were not sustained at 2 hours. We calculated a Rapid Acute Physiology Score (RAPS) score based on triage observations; patients with a RAPS above 6 were all admitted, but most admitted patients had a RAPS of 0-2. Most patients treated and discharged also had a RAPS of 0-2, but scores as high as 5 were also reported. Conclusions: The One Day in Emergency (ODE) study provided valuable insight into the feasibility of conducting clinical epidemiological research through data linkage in emergency medicine.

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Characteristics of Non-traumatic Young-old Patients Visiting the Emergency Department
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Background and Objectives: As well as the number of elderly patients visiting in the ED increases, the health’s quality of elderly population is also improving. It is necessary to change the definition of elderly people who are over 65 years old. This study aim was to investigate whether the characteristics of the ED patients aged 65 to 70 years old, who are the elderly based on current standards, are similar to those of the elderly who are older than 71. Methods: Non-traumatic patients to visit ED of 5 university hospitals in Korea’s metropolitan area in 2017 were enrolled and classified into three groups (control, 55 to 65 years; young-old, 65 to 71 years; old, 71 years or older). Age, sex, route, discharge outcome, triage score, vital sign, number of test, exam time, duration in ED, HOD were analyzed. Results: A total of 251,715 patients visited the emergency room during the study period, and non-traumatic patients over 18 years of age were 119,652. Among these, control group 16,616 (13.9%), young-old 7,690 (6.3%), old, 21,000 (17.6%) were enrolled. In female ratio (53.0% vs. 51.2% vs. 57.6%, p<0.001), onset to door time (38.3±15 minutes vs. 41.1±141 minutes, p=0.449; 41.1±141 minutes vs. 49.1±169 minutes, p=0.001), there was no difference between control group and young-old, but was a difference between young-old and the elderly. While no. of test (4,19±3,22 vs. 4,99±2,27 vs. 5.05±2.24, p<0.001) and the duration in ED (3.1±3.29 hours vs. 3.57±3.86 hour vs. 4.1±2.417 hour, p=0.001) increased with age. Type of discharge and HOD (32.2±27.59 vs. 34.2±5.94±5.97, p=0.414, 34.2±15.97±4.25±6.65, p<0.001) were similar in the control and the young-old and there was a difference with the elderly. Conclusions: Non-traumatic patients aged 65 years to 71 years in EM are more likely to be middle-aged patients than elderly in the pre-emergency characteristics, type of EM discharge and HOD.

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Feel For the Pulse to Save the Limb and Life—a Case Report
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Background and Objectives: Acute limb ischemia is defined as a sudden decrease in limb perfusion that threatens the viability of the limb. The incidence of this condition is approximately 1.5 cases per 10,000 persons per year. The clinical presentation when it is considered to be acute if it occurs within 2 weeks after symptom onset. Rates of death and complications among patients who present with acute limb ischemia are high. Urgent recognition with prompt revascularization is required to preserve limb viability in most circumstances. Methods: Case Discussion: We present here a case of Acute Limb Ischemia which was diagnosed with clinical examination although patient was referred to us as a case of Acute Stroke. Results: 42 year old a known case of Type II DM presented to the ER with Sudden onset weakness in both legs since one day. He was initially taken to a local hospital, diagnosed as Acute Infarct Bilateral FrONTAL Lobe in MRI scan and referred.On examination in the ER he was conscious, oriented with a BP of 130/80 and SpO2 90% in upper-limbs. On physical examination he was found to be have bilateral cold insensate lower limbs with power 0/5 and no pulsations and absent Doppler signals. CT-Angiogram revealed—Completely occlusive aorto-iliac thrombosis with extension into the left external iliac artery, along with completely occlusive thrombosis of the left renal artery with renal infarct and Splenic infarcts. Patient was taken up for emergency bilateral transfemoral aorto-iliac & distal thrombectomy with left antero-lateral fasciectomy. He regained limb power and was subsequently discharged. Conclusions: Limb Ischemia is a potentially catastrophising condition that can progress rapidly to limb loss, disability and death if not recognized and treated promptly. The clue for diagnosis is absent pulse. This case highlights good outcome of prompt treatment and importance of thorough clinical examination in this age of high end investigations.

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Utility of Calcium, Magnesium and Phosphate Testing in the Emergency Department
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Background and Objectives: Calcium, magnesium and phosphate levels are commonly measured in the emergency department (ED). However, their usefulness in this setting is questionable. We aimed to determine how frequently each electrolyte level is measured, the yield of abnormal levels, and how frequently the results change patient management. Methods: We undertook a retrospective study of all adult patients who presented to a tertiary referral ED between January-June, 2017. Patients who had serum calcium, magnesium or phosphate levels ordered were included. Data were extracted from the electronic medical record: laboratory values, symptoms, co-morbidities, medications and management changes initiated in the ED. Chi square tests compared proportions within patient subgroups (e.g. low/ high level vs. normal). Logistic regression identified patients at risk of low/high electrolyte levels. Results: 1,716 (5.2%) of 33,120 patients had at least one calci-
um, magnesium or phosphate test. 776 (16.2%) of 4,776 individual electrolyte tests were abnormal. 57 tests (7.3% of abnormal tests, 1.2% of all tests) were associated with a change in ED management to correct the abnormality. 50 (2.9%) patients had management changes despite normal electrolyte levels. Despite a lack of evidence, almost all of these (49 patients) were administered magnesium in the setting of a cardiac presentation. Specific patient characteristics were significantly associated (p<0.05) with abnormal calcium (e.g. pancreatitis, confusion, cancer), magnesium (e.g. alcohol abuse, proton pump inhibitor medication) and phosphate (e.g. nausea, glucocorticoid medication) levels. **Conclusions:** Although these electrolyte levels are frequently measured, they rarely change patient management. Some patients have management changes despite normal levels. The regression results will inform guidelines to better target patients at risk of abnormal levels, consistent with the Choosing Wisely initiative. **Corresponding Author:** David Taylor (David.Taylor@ausinst.org.au)

**Case Report: Acute Ischaemic Stroke Mimic Radial Nerve Palsy**

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**Background and Objectives:** Clinical presentation of patients with acute thromboembolic stroke may vary according to the affected area of brain lesion. However, isolated monoparesis of stroke is uncommon and rarely encountered. It may be misdiagnosed as a peripheral nerve lesion hence delaying further investigation of stroke. We report a case of a gentleman with isolated monoparesis of stroke who came with clinical features of posterior interosseous branch of radial nerve palsy. Diagnosis of stroke was made based on clinical presentation, thorough examination and investigation and was confirmed with computed tomography (CT) scan and magnetic resonance angiogram (MRA). **Methods:** Case report. **Results:** Blood investigations sent for full blood count, electrolytes and coagulation profile. Sugar was normal. However, electrocardiogram demonstrated new onset of atrial fibrillation with a rate of 130 beat per minute. Patient was then directed to radiological work up. CT scan of head revealed a small hypodense lesion of right precentral gyrus near hard area, suspicious for a small subacute MCA infarct. Finding was confirmed after MRA done. No acute intracranial haemorrhage or midline shift was noted. ECHO was done and noted to have valvular lesion. **Conclusions:** Isolated monoparesis are frequently misdiagnosed as peripheral nerve palsy and should be suspected for acute stroke if high index suspicion. 2. Thorough history, clinical examination and investigations are important in order to provide the correct diagnosis and the best management of stroke patient. 3. Delay in diagnosis of acute stroke may lead to delay of management and subsequently cause further or permanent damage to patient. **Corresponding Author:** Sakinah Sobri (ss.acuihr@gmail.com)

**Opioid Requirement in Adult Patients with Painful Conditions Treated with Paracetamol in the Emergency Department: a Prospective, Cohort Study**

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**Background and Objectives:** Pain prevalence in Emergency Department (ED) patients is high, therefore pain management is important in acute treatment. Besides paracetamol and Non-Steroidal Anti-Inflammatory Drugs, opioids are often used in patients with severe pain. However, because of the current opioid epidemic, it would be beneficial to reduce opioid use as much as possible. The objective of this study was to evaluate whether administration of paracetamol could lead to a reduction in opioid requirements in patients with acute pain from various causes. **Methods:** This prospective cohort study was conducted in the ED of a Level 1 trauma center between January 30th and March 18th 2018. All consecutive patients of 18 years and older were included, in case they received opioid analgesics either prehospitaly or in the ED. Patients with chronic analgesia use were excluded. Patients receiving additional paracetamol were compared to patients who did not receive this. The primary outcome was total opioid requirement, measured utilizing Morphine Equivalent Units (MEU). Secondary outcome was decrease in pain scores. **Results:** A total of 185 patients were included in the study with a mean age of 48.5 years, of whom 138 (73.5%) received additional paracetamol, besides the opioid. Total median opioid consumption was not significantly different between patients who received paracetamol and patients who did not: 10 MEU vs. 7.25 MEU (p=0.06). Pain score reduction after opioid administration in patients who did not receive paracetamol was 80%, and 50% in patients who did receive additional paracetamol (p=0.03). **Conclusions:** There was no significant difference in opioid requirement between patients who received paracetamol and patients who did not. Contradictory, pain score reduction was in favor of patients who received paracetamol.
Comparison Effectiveness of Conventional vs. Modified Telephone-Assisted Cardiopulmonary Resuscitation in Secondary School Students

Punyaporn Khemnak

Background and Objectives: In Thailand, the Thai National Institute for Emergency Medicine has developed a program for assisting CPR by telephone (telephone instruction CPR). One study found problems with hand positioning and overlapping hands. The objective of this study was to compare the effectiveness of basic CPR between using the conventional CPR telephone assistance service (cCPR) and the modified CPR telephone assistance service (mCPR).

Methods: This research was conducted using the unsystematic experimental method. The data was collected from students at a secondary school in Bangkok, Thailand. The mCPR is an improved version of cCPR acting on suggestions from a focus group, such as adding or reducing explanations of each command, to make it more understandable for bystanders. This study compared the quality of CPR between mCPR and cCPR groups including pushing hard, pushing fast, allowing the completion of chest recoil, minimizing interruptions in compressions, avoiding excessive ventilation, the time of beginning of CPR, and CPR performance. Results: There were 98 participants. 49 of them followed the mCPR method, another 49 followed the cCPR method. These in the mCPR group corrected their CPR position more than those in the cCPR group [39 participants (79.59%) vs. 13 participants (26.65%) p-value=0.01]. The mCPR group had more overlapping hands than cCPR group [41 participants (83.67%) vs. 13 participants (26.53%) p-value<0.01]. For vertical compression, mCPR group showed greater accuracy than cCPR group [45 participants (91.84%) vs. 16 participants (32.65%) p-value<0.01]. There was no difference in the quality standard of the CPR for pushing hard, pushing fast, and allowing complete chest recoil between both groups. Conclusions: This study demonstrated that the conventional CPR assistance service was effective. However, the modified CPR assistance service results in more accurate positioning and enhances the effectiveness of CPR.

Telemedicine-Assisted Transportation of Critically Ill Patients Between Same-Institution Locations

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Background and Objectives: Transportation of critically ill patients between hospital locations usually requires a highly-specialized ambulance team, including a trained driver, paramedics and a medical doctor. Keeping a physician available to assist on that type of transportation is expensive, expanding idleness and occupational hazard. Methods: All critically ill patients admitted to one of four satellite Emergency Departments of Hospital Israelita Albert Einstein and requiring ambulance transfer to the main building were eligible to telemedicine (TM)-Assisted Transportation, using an LTE-enabled iPad and free videoconferencing software. Unstable, intubated, STEMI and Acute Stroke patients were excluded. A physician from the TM center was contacted at the beginning and end of all critical transfers and data was electronically recorded. Data from November 2016 to November 2018 will be presented. Results: From Nov/16 to Nov/18, 2,273 critical transfers were performed to our institution, 1,938 (85.3%) TM-assisted. There was a 30% cost reduction considering physician time savings. Medical intervention during TM-assisted critical transfer was required in only 25 cases (1.2%). All of which were manageable through virtual interaction. There has been no single transfer in which an onboard doctor would be superior to TM-assisted support, considering the risk selection. Conclusions: Telemedicine-assisted transportation of critically ill patients can safely substitute an onboard physician on most transfers between same-institution locations. A simple LTE-enabled tablet held by a plastic support and a bluetooth headset is enough for effective communication during ambulance transfers considering an urban environment.

Assessment of a New Prehospital Triage and Acuity System For Emergency Medical Technicians

Chengyu Chien, Chipin Hsu

Background and Objectives: Prehospital healthcare providers need to be efficient and effective in providing emergency care, especially patients in “golden time”. Patients in “golden time” refer to acute coronary syndrome, acute stroke, major trauma, and cardiac arrest. These patients need to be managed in timely manner and providing essential information to the receiving hospital is important. But according to recent national reports, key initial assessment, neurologic exams, and electrocardiogram recordings on site are lacking, causing delay in providing essential care to the patients. The objective of this study was to develop and evaluate training course to enhance prehospital providers’ competencies in managing “golden time” patients. Methods: A 4-hour course consisted of a short didactic lecture, technical skills training, and scenario-based simulation. Scenario-based simulation were derived from actual cases, and hybrid simulation method was used. Actors were involved to act as acutely ill or injured patients on site, and high-technology simulators were used when emergency intervention was involved. Performance evaluation was done using the actual pre-hospital assessment protocol used by the providers. Post-survey questionnaire was used to evaluate the course. All pre-to-post differences within subjects were analyzed with paired t tests. Results: Total of 80 prehospital providers from three different region volunteered to be involved. The competencies for initial key assessment and communication improved from pre- to post-course (p<0.05). Overall course satisfaction in average for expectation, delivery method, and contents were 9.7, 9.8, and 9.8, respectively. Conclusions: There needs to be tests to recognize gaps of systems in place for prehospital care. Simulation exercises is an ideal tool for this purpose. Although this was only a 4-hour intensive course, this increased familiarity with workflows, tested the coordination of workflows between different disciplines and allowed the identification of gaps.
Interventions to Improve the Quality of Bystander Cardiopulmonary Resuscitation: a Systematic Review

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Background and Objectives: Performing high-quality bystander cardiopulmonary resuscitation (CPR) improves clinical outcomes of cardiac arrest victims. Nevertheless, no systemic review has been performed to identify interventions associated with improved bystander CPR quality. Methods: The databases Ovid MEDLINE, Ovid EMBASE, EBSCO CINAHL, Ovid PsyInfo, Thomson Reuters SCI-EXPANDED, and the Cochrane Central Register of Controlled Trials were searched for relevant English articles from January 1966 to October 2018 associated with interventions that could improve the quality of bystander CPR. Data regarding participant characteristics, interventions, design and outcomes of included studies were extracted. Results: Of the initially identified 2,703 studies, 42 were included finally, and 32 of them were randomized controlled trial. Participants included non-medical professionals, high school students, and university students with non-medical professional majors. Modified telephone dispatcher assisted-CPR (DA-CPR) instructions, such as adding instruction with speakerphone activation, encouraging bystander to push harder, elimination of the instruction to remove the victim’s clothing, modified instruction using arm and nipple line, were helpful for improving bystander CPR quality. Compression-only CPR tended to improve CPR quality compared to conventional method in 5 studies, while early physical fatigue when performing compression-only CPR was described in 2 studies. Four-hand CPR for the elderly, and CPR with heels for a tired rescuer were shown to improve chest compression depth. Two rescuers on the opposite sides reduced hands-off time. Additional aids to bystander CPR, like telephone DA-CPR, simple basic life support flowchart, real-time feedback device, pneumatically powered transport ventilator, were also beneficial. Video-assisted DA-CPR was superior to, at least equivalent to telephone DA-CPR on CPR quality, but was found to increase time starting resuscitation. Newly-developed CPR support applications increased number of total chest compressions, but were associated with longer time to initiate resuscitation. Conclusions: Above-mentioned effective interventions associated with improved bystander CPR may be included in the protocols for bystander CPR.

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The Understanding of Emergency Medical Services by Foreign Residents in Japan

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Background and Objectives: These years foreign visitors have been increasing in Japan. The tendency is expected to be accelerated heading for the Tokyo Olympic Games in 2020, followed by the Osaka Expo in 2025. The purpose of this study is to investigate to what extent EMS is understood by foreign residents in Japan. Methods: We collected questionnaires from foreigners who had an experience of living in Japan. The questionnaire was composed of 10 questions including nationality, period of stay, the experience of calling an ambulance, reasons for calling an ambulance, and so on. Results: Fifty-seven completed questionnaires were returned as of November 2018. Average age was 34, and 32 person out of 57 were men. Their experiences of calling an ambulance were 21%, which showed less than that of Japanese in the same age. 90% of them worried about language, and 70% about medical fee. In case of facing medical emergency case, 95% of respondents thought that they should call an ambulance only when it seeming to be a dangerous state of life. However, some of them didn’t know even the emergency call number. Conclusions: We confirmed the results that foreign residents in Japan did not necessarily understand Emergency Medical Services (EMS). In addition to the hospitality, providing EMS information to foreign visitors should be more actively considered by all related people.

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high systolic AP than standard CPR. However, diastolic AP, RAPD, CPP, ETCO2, and resuscitation outcomes measured by ROSC and 2-hour survival were not different between the two CPR groups. 

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**PO_RES_02_02**

Can Transesophageal Echocardiography During CPR Change Resuscitation Outcomes in Prolonged Cardiac Arrest?  
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**Background and Objectives:** Early diagnosis of a potential cause of cardiac arrest is crucial for resuscitating the cardiac arrest victim. Transesophageal echocardiography (TEE) provides an excellent window to visualize the heart and aorta without any interruption of resuscitation effort during cardiopulmonary resuscitation (CPR). This study was to investigate whether TEE during CPR influences resuscitation outcome in patients with non-traumatic adult cardiac arrest who receive prolonged resuscitation attempt. **Methods:** This retrospective observational study of a prospectively collected data was conducted by analyzing the patients with non-traumatic adult cardiac arrest who underwent TEE during CPR in the emergency department of a university hospital between January 2014 to November 2018. According to the availability of TEE and experienced emergency physicians, TEE was performed during CPR when resuscitation attempt was prolonged longer than 10 minutes. Positive TEE group was composed of those who have any structural abnormality observed by TEE. Negative TEE group was those who have no structural abnormality. Primary outcome measure was restoration of spontaneous circulation (ROSC). **Results:** A total of 121 patients were enrolled. 41 patients (33.9%) were included in positive TEE group and 80 patients (66.1%) were included in negative TEE group. Abnormality observed in positive TEE group included aortic dissection in 17 patients, pulmonary thromboembolism (PTE) in 10 patients, intra-cardiac thromb in 8 patients, cardiac tamponade in 5 patients, and hypertrophic cardiomyopathy in 1 patient. The rate of ROSC and survival discharge was not different between positive TEE group and negative TEE group. Two patients with PTE who received fibrinolysis survived, and 1 patient with hypertrophic cardiomyopathy treated by ECMO survived. **Conclusions:** TEE during CPR does not change resuscitation outcomes in patients with prolonged cardiac arrest. However, resuscitation outcome might be changed with TEE in patients with specific etiology such as PTE or cardiomyopathy. 

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**PO_RES_02_03**

Impact of Rapid Lactate Clearance as an Indicator of Hemodynamic Optimization on Outcome in Out-of-hospital Cardiac Arrest: a Retrospective Analysis  
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**Background and Objectives:** We analyzed the impact of rapid lactate clearance as an indicator of hemodynamic optimization on outcome of out-of-hospital cardiac arrest (OHCA) during early post-cardiac arrest care (PCAC). **Methods:** This retrospective analysis was based on a prospective cohort. We selected adult patients with OHCA who achieved a survival event from May 2006 to December 2017. A survival event was defined as sustained return of spontaneous circulation of 20 minutes or more. Serum lactate levels were measured at 0 and 6 hr after a survival event from May 2006 to December 2017. A survival event was defined as sustained return of spontaneous circulation of 20 minutes or more. The primary measurement was re-arrest that was defined as recurrent cardiac arrest within 24 hours after survival event. **Results:** Of 534 patients suitable for inclusion, 203 (38.0%) was enrolled in the re-arrest group. Old age, prolonged ACLS duration, and the presence of hypotension at 0 hr after survival event were independent variables predicting re-arrest. The potential for re-arrest and the incidence of hypotension increased with increasing ACLS duration. In re-arrest group, the ECPR group (n=25) showed better outcome than the CCPR group. However, multivariate analysis for predicting survival to discharge revealed that ECPR was not an independent factor and that no hypotension at time of re-arrest was independent variables in re-arrested OHCA patients. **Conclusions:** Alternative methods that reduce the ACLS duration should be considered to prevent re-arrest and attain good outcomes in OHCA patients. ECPR for re-arrest tended to show a good outcome compared to that of CCPR for re-arrest. Additionally, avoiding or immediately correcting hypotension may prevent re-arrest and improve the outcome of re-arrested patients. 

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**PO_RES_02_04**

Risk Factors For Re-arrest After Survival Event and Extracorporeal Cardiopulmonary Resuscitation For Re-arrest: a Retrospective Analysis  
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**Background and Objectives:** The objectives of this study were to 1) identify the risk factors for predicting re-arrest and 2) determine whether extracorporeal cardiopulmonary resuscitation (ECPR) results in better outcomes than conventional cardiopulmonary resuscitation (CCPR) for managing re-arrest in OHCA patients. **Methods:** This retrospective analysis was based on a prospective cohort. We selected adult patients with non-traumatic OHCA who achieved a survival event from May 2006 to December 2017. A survival event was defined as sustained return of spontaneous circulation of 20 minutes or more. The primary measurement was re-arrest that was defined as recurrent cardiac arrest within 24 hours after survival event. **Results:** Of 534 patients suitable for inclusion, 203 (38.0%) was enrolled in the re-arrest group. Old age, prolonged ACLS duration, and the presence of hypotension at 0 hr after survival event were independent variables predicting re-arrest. The potential for re-arrest and the incidence of hypotension increased with increasing ACLS duration. In re-arrest group, the ECPR group (n=25) showed better outcome than the CCPR group. However, multivariate analysis for predicting survival to discharge revealed that ECPR was not an independent factor and that no hypotension at time of re-arrest was independent variables in re-arrested OHCA patients. **Conclusions:** Alternative methods that reduce the ACLS duration should be considered to prevent re-arrest and attain good outcomes in OHCA patients. ECPR for re-arrest tended to show a good outcome compared to that of CCPR for re-arrest. Additionally, avoiding or immediately correcting hypotension may prevent re-arrest and improve the outcome of re-arrested patients. 

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**PO_RES_02_05**

Could Medical Staff Push the Appropriate Position During the Chest Compression?  
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**Background and Objectives:** Guideline 2015 suggested performing chest compression (CC) on the lower half of the sternum and placing the heel of hand in the center of the chest and the heel of the other hand on top of the first. We evaluated whether the medical staff could push on appropriate place during CC with the proper compression position and hand placement. **Methods:** 44 medical staffs participated in this study. We measured the pressure using a dedicated equipment measurable in 5×5 cm area at the position of CC. Center mark was set up on the lower half of the sternum in a simulator doll, SimManTM. Each participant performed CC for one minute from both side of the SimManTM. Most largest pressure area was defined as the max area (MA). We divided participants into 4 groups by the standing position, right (R) or left (L) side of SimManTM, and contact side of the hand (C) during the CC. **Results:** In case of CC from the right side, there were 20 participants in R-L, and 24 in R-R. Appropriate MAs were only 5 in R-L, and 3 in R-R. In case of CC from the left side, there were 21 in L-L, and 23 in L-R. Appropriate MAs were 2 in L-L, and 6 in L-R. The position of CC in total 81% of participants was inappropriate, and each position was confirmed same compressive tendency by the ulnar side of hand contacting chest wall. **Conclusions:** Most of the participants couldn’t push on appropriate place even if the proper compression position and hand placement. It is necessary to monitor not only the depth but also the position and correct the displacement in real-time. 

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Identification and Prognostication in Acute Coronary Syndromes Using Multiple Physiological Scoring Systems
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Background and Objectives: Chest pain is a common symptom in emergency departments (EDs), and is associated with numerous serious conditions such as acute coronary syndrome (ACS). Our aim was to compare four simple risk indices, calculated from vital triage physiology, in their ability to stratify risk in such patients. Methods: Patient demographics, physiology, hospital course, incidence of major adverse cardiac events (MACE) and discharge diagnosis were examined retrospectively. Patients were classified as having 1) serious diagnosis or non-serious diagnosis 2) ACS or non-ACS or 3) in-hospital MACE or non-MACE. The differences between the groups for each outcome was determined by univariate analysis and multivariable non-linear modelling. Results: The performance of each index was then quantified by calculating the area under the receiver operating characteristic curve for each model (AUC-ROC). Results: A total of 420 patients were recruited. 75 (17.8%) had a serious diagnosis, 38 (9.0%) had ACS and 37 (8.8%) had MACE. All risk indices were found to be significantly associated with a serious diagnosis, ACS and MACE (p<0.05). In multivariable modelling, two of the risk indices did not retain significance. For the discrimination of a serious diagnosis, we found all risk index models to have a relatively high AUC (>0.7) however the highest AUC (0.8088) was generated by a model which only included physiological values and age. For ACS, the model which included age and gender had the highest AUC (0.8167), and for MACE the model including gender and the TIMI risk index (TRI) had the highest AUC (0.7568). Conclusions: The four risk indices may be a useful predictor of serious underlying pathology, including ACS, and of short-term MACE, however larger studies are required with more stringently defined outcome groups in order to validate these results.
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Factors Associated with the Short Term Survival From Cardiopulmonary Resuscitation among Older Patients in a Middle-Income Country
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Background and Objectives: This study was aimed to explore factors associated with short term survival from Cardiopulmonary Resuscitation (CPR) among older patients in a middle-income country. Methods: We retrospectively reviewed data of all patients aged 60 years and older who presented to our emergency department (ED) after an out-of-hospital cardiac arrest (OHCA) during 2010 to 2017. Data collection was done using Utstein-Style Guidelines for uniform reporting of data by trained research assistants. The primary outcome was to determine the success rate of CPR and factors associated with 7-days survival in OHCA among older patients. Data was calculated using appropriate statistical analysis. Results: Survival from each factor were presented by median survival time, which analyzed in to hazard ratio. Results: We had 308 patients in our study. One hundred and sixty-five patients (53.6%) were female, with a mean age of 74.78 ± 9.50 years. An average CPR time was 26.75 ± 16.64 minutes and average time to ROSC was 17.56 ± 12.95 minutes. A total of 163 (52.9%) achieved ROSC and 88 (28.6%) patients were survived to hospital admission. Overall median survival time was 7 days. In multivariable analysis model. Administration of both amiodarone and lidocaine was associated with improved survival [Hazard ratio (HRad) 0.30 95% CI 0.19-0.93]. On the contrary, patients with first recorded ECG as asystole (HRad) 1.99 95% CI 1.13-3.50) and those required time to ROSC more than 12 minutes (HRad 3.59 95% CI 2.30-5.63) decreased a chance of survival. Conclusions: Half of the older patients had ROSC and almost one third survived to hospital admission. Administration of both amiodarone and lidocaine predicted 7 days survival among older adults. Our study may give some idea in crucial decision-making for out of hospital cardiac arrest among older adults.
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The Adjusted Incidence of Shockable Rhythm by the Bystander Category: a Nationwide Population Based Study

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Background and Objectives: The purpose of this study is to identify which type of bystander improves the incidence of shockable rhythm by adjusting response time, sex and age.

Methods: A total of 1,299,784 OHCA patients from 2005 through 2015 in Japan's nationwide registry were enrolled. We included adult patient 15-84 yo, for whom the collapse was witnessed. We excluded patients with Public Access Defibrillation, and patients for whom the time exceeded the 99 percentile of collapse to EMS contact interval. The primary end point was adjusted incidence of shockable rhythm as initial cardiac rhythm. The patients were categorized into three groups as a dispatcher assisted CPR (DA-CPR), bystander-initiated CPR (BI-CPR) without instruction and No CPR (No-CPR). Patients were also categorized into 3 groups according to their ages as 15-64 yo, 65-74 yo and 75-84 yo. The bystanders were categorized 3 groups as families, friends and others. The Cox’s proportional hazards regression model was used to test the significance of shockable rhythm adjusting for age, response time (119 call to first contact), gender, performing CPR with or without of dispatcher instruction. Results: A total of 231,057 patients met the inclusion criteria. In the DA-CPR group, adjusted hazard ratio (HR) and 95% confidence interval for using No-CPR as reference at 2005 and 2015 were as follows; the family was 1.05 (0.96-1.16) and 1.54 (1.42-1.68), friends were 1.10 (0.90-1.34) and 1.63 (1.42-1.88) and others were 1.39 (1.12-1.73) and 1.25 (1.05-1.50). On 2015, 32.2% of the BCPR by others are performed in elderly facilities. Conclusions: The incidence of shockable rhythm by dispatcher assistance has been increasing. The family and bystander CPR has been improving. We think family and bystander CPR are the one of the main reasons of improving the good neurological outcome in Japan.

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Emergency Department Bedside Cardiac Ultrasound to Predict Patient Outcome, a Retrospective Cohort Study

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Background and Objectives: Cardiac arrest patients with non-shockable rhythm have poor outcomes despite advanced resuscitation measures. Predictors of outcomes are needed to guide the resuscitation. The study was to identify heart beat using ultrasound during resuscitation in cardiac arrest patients with non-shockable electrocardiogram (EKG) rhythm to predict the return of spontaneous circulation (ROSC) and the survival to admission as the primary and secondary outcomes.

Methods: A single-centered retrospective cohort study was conducted. Furthermore, ultrasound images were recorded during pulse checks (Cardiac views from subxyphoid and parasternal approach) and confirmed by an emergency ultrasound specialist. Data including initial EKG, interventions and discharge status were obtained. Patients with OHCA patients compared to those without.

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To Do or Not to Do: Ultrasound-Guided Pericardiocentesis For Massive Cardiac Tamponade in a Patient with Coagulopathy

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Background and Objectives: While it is a best practice to exclude and correct coagulopathy prior to pericardiocentesis, it is not a feasible practice for patient presenting to Emergency Department with massive cardiac tamponade and in a near collapse state. Ultrasound guided pericardiocentesis can minimise the risk of iatrogenic injury in these patient including those with pre diagnosed coagulopathy.

Methods: Case Report. Results: We describe a case of 41-year-old gentleman with underlying hypertension who presented to Emergency and Trauma Department due to worsening shortness of breath and painful left lower limb swelling. In the Emergency Department, he developed altered consciousness, hypoxic and in shock. Clinical and bedside ultrasound assessment revealed massive pericardial effusion with collapsed right ventricle on diastole. He was immediately started on vasopressor, intubated and the cardiac tamponade was drained under ultrasound guided. 1.8 litre of haemorrhagic fluid was drained and his vital sign improved. Blood investigation showed anaemia, coagulopathy, deranged liver and kidney function. He was transfused with two pint of safe O blood, four pints of fresh frozen plasma and admitted to Intensive Care Unit ward. Further work-up was performed to determine the cause. In view of that, he was decided for palliative care and not for active resuscitation. He died at day seven of admission.

Conclusions: Coagulopathy is not an absolute contraindication for pericardiocentesis. While it is a best practice to correct coagulopathy prior to pericardiocentesis,
it can be performed safely under ultrasound guided in patient who presented to Emergency Department with a state of near-collapse as a result of cardiac tamponade.

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**PO_RES_06_07**

**Bystander Interventions among Out-of-hospital Cardiac Arrests Before and After Implementation of a Residential Public Access Defibrillation Program - A Pilot Evaluation**

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**Background and Objectives:** Annually, 2,300 individuals in Singapore suffer from out-of-hospital cardiac arrest (OHCA), a condition with a low survival rate of 3.2%. Previous studies have shown that most OHCA occurred in residential areas. Hence, to improve survival, a residential public access defibrillation program (PAD) was implemented in six regions in Singapore. This study aimed to compare bystander interventions and survival before and after program implementation. **Methods:** This was a retrospective cohort study of OHCA cases in the six regions captured in Singapore’s national OHCA registry. Before period was defined as 1 July 2010–30 June 2015; after period was defined as 1 July 2015–31 July 2016. Primary outcomes were bystander cardiopulmonary resuscitation (CPR) and automated external defibrillator (AED) administration. Secondary outcomes were prehospital return of spontaneous circulation (ROSC) and survival to admission. **Results:** We included 2246 cases in the analysis with 1720 cases in the before and 526 in the after phase. In the multivariable logistic regression, the program was associated with an increase in bystander CPR only in residential areas [OR:2.56 (95% CI 2.06–3.17)] and an increase in prehospital ROSC [OR:1.69 (95% CI 1.03–2.78)] only in arrests that were witnessed by bystanders. No significant association was found for survival to admission [OR:1.10 (95% CI 0.83–1.46)]. Among arrests that were witnessed by bystanders whereas 2 thumb-encircling hands technique (TTT) for 2 or more resuscitators whereas 2 fingers technique (TFT) for single rescuer whereas 2 thumb-encircling hands technique (TTT) for 2 or more rescuers. Notably, recent several studies reported that TTT is more effective for high quality chest compression than TTT for one rescuer in infant CPR. We performed a systematic review and meta-analysis to compare TTT with TFT for single rescuer in infant manikin studies. **Methods:** We searched MEDLINE, EMBASE, and the Cochrane Library for eligible randomized controlled trials (RCTs) published before December 2017, including with cross-over design study. The primary outcome is mean difference of compression depth (mm) and the secondary outcome is mean difference of compression rate (counts/minute). A meta-analysis was performed using Review Manager 5.3. **Results:** A total of 6 RCTs were included. The study that reported the both data of chest compression depth and rate was included. TTT was deeper than TFT for mean chest compression depth (mean difference 5.50 mm [95% CI 0.32 to 10.69 mm]; p = 0.04). However, there was no significant difference in mean chest compression rate (mean difference -7.89 mm/s). **Conclusions:** Moderate brain hypothermia before resuscitation improved survival and reduced histological neurological injury, spatial memory impairment, and anxiety-like behaviours after CA/CPR in mice.

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**PO_RES_10_02**

**Efficacy of Cerebral Perfusion Pressure, Intracranial Pressure, and Mean Arterial Pressure For Prediction of Neurological Prognosis and Mortality in Cardiac Arrest Survivors Who Had Undergone Target T**

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**Background and Objectives:** Blood and intracranial pressure (ICP) measures are used to predict neurologic outcomes in cardiac arrest (CA) survivors. Cerebral perfusion pressure (CPP) use to predict the prognosis in CA survivors who received time temperature management (TTM) has rarely been studied. We aimed to compare the efficacy of mean arterial pressure (MAP), ICP, and CPP for prediction of neurological prognosis in CA survivors. **Methods:** We retrospectively examined CA patients treated with TTM. ICP was measured using cerebrospinal fluid (CSF) pressure, and MAP was measured as blood pressure monitored through a radial or femoral artery during CSF pressure measurement. CPP (mmHg) was calculated using MAP and ICP measurements. Primary outcome was neurologic outcome at 6 months. **Results:** Of 92 enrolled patients, a favourable outcome group comprised 31 (34%) patients. The median and interquartile range [IQR] of MAP and ICP were significantly higher and ICP was significantly lower in patients with favourable neurologic outcomes than in those with unfavourable neurologic outcomes (94.3 mmHg [80.0-105.3] vs. 82.0 mmHg [65.3-96.3], p = 0.021; 18.8 mmHg [20.0-15.7] vs. 9.4 mmHg [10.8-8.7], p < 0.001; and 34.4 mmHg [24.4-51.8] vs. 66.7 mmHg [49.6-74.4], p< 0.001, respectively). ICP showed the highest area under the receiver operating characteristic curve (AUC; 0.953, 95% confidence interval [CI]; 0.888-0.986) for neurological outcome prediction. CPP showed the next highest AUC (0.815, 95% CI; 0.721–0.889). **Conclusions:** ICP was the highest prognostic performer, followed by CPP, and both prognostic performances were good. Prospective multicentre studies are required to confirm these results.

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**PO_RES_10_03**

**Comparison of 2-thumb-encircling and 2-fingers Technique During Infant Cardiopulmonary Resuscitation For Single Rescuer; a Meta-analysis**

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**Background and Objectives:** Chest compression technique in infant cardiopulmonary resuscitation (CPR) is recommended 2 fingers technique (TFT) for single rescuer whereas 2 thumb-encircling hands technique (TTT) for 2 or more rescuers. Notably, recent several studies reported that TTT is more effective for high quality chest compression than TTT for one rescuer in infant CPR. We performed a systematic review and meta-analysis to compare TTT with TFT for single rescuer in infant manikin studies. **Methods:** We searched MEDLINE, EMBASE, and the Cochrane Library for eligible randomized controlled trials (RCTs) published before December 2017, including with cross-over design study. The primary outcome is mean difference of compression depth (mm) and the secondary outcome is mean difference of compression rate (counts/minute). A meta-analysis was performed using Review Manager 5.3. **Results:** A total of 6 RCTs were included. The study that reported the both data of chest compression depth and rate was included. TTT was deeper than TFT for mean chest compression depth (mean difference 5.50 mm [95% CI 0.32 to 10.69 mm]; p = 0.04). However, there was no significant difference in mean chest compression rate (mean difference -7.89 mm/s).
counts/minutes [95% CI = -16.77 to 0.99 counts/min]; p=0.08). **Conclusions:** This study indicates that TTT is more proper technique for single rescuer to perform high quality chest compression in consideration of compression depth than TFP in infant manakin studies.

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**PO_RES_10.04**

Protective Role of Kallistatin in Ischemia-reperfusion Injury

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**Background and Objectives:** Ischemia-reperfusion injury (IR injury) plays an important role in neurologic deficit after cardiac arrest, and oxidative stress acts as the main mechanism of IR injury. Kallistatin is an endogenous protein inhibiting tissue kallikrein activity. In our previous study, we found that low serum kallistatin level was associated with poor neurological outcome of out-of-hospital cardiac arrest survivors. This study was performed to investigate the cell protective effects and mechanism of kallistatin during IR injury. **Methods:** We transfected human umbilical vein endothelial cells (HUVEC) with small interfering RNA (siRNA) of SERPINA4 gene which expresses kallistatin. To access transfection ability, SERPINA4 messenger RNA (mRNA) and kallistatin levels were measured. To induce IR injury, the SERPINA4 knock-down cells and the control cells were exposed to 90 minutes of oxygen-glucose deprivation followed by 22.5 hours of reoxygenation (OGD/R), and then, cell viability was accessed. We also measured total nitric oxide (NO) and endothelial nitric oxide synthase (eNOS) levels and compared them between the SERPINA4 knock-down cells with OGD/R and the control cells with OGD/R. **Results:** SERPINA4 siRNA transfection totally suppressed SERPINA4 gene expression and kallistatin expression. OGD/R reduced cell viability in both the SERPINA4 knock-down cells and the control cells. However, in the SERPINA4 knock-down cells with OGD/R, the reduction of cell viability was more prominent than in the control cells with OGD/R. The total NO and eNOS levels decreased more prominently in the SERPINA4 knock-down cells with OGD/R than in the control cells with OGD/R when compared to the control cells. **Conclusions:** In the present study, we found that kallistatin had an anti-oxidative property and that the protective role of kallistatin against oxidative stress is mediated by ENOS activation.

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**PO_RES_10.05**

A Comparison Between CPR Performed by Paramedics and CPR Performed Mechanically in Both a Simulated Cardiac Arrest and Cardiac Arrest Occurring Mid-transport in Ambulances

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**Background and Objectives:** Paramedics carry a vital role in the treatment of acute cardiac arrest in patients. However, due to various obstacles such as lack of manpower and long-distance transports, maintaining high-quality cardiopulmonary resuscitation (CPR) in ambulances becomes difficult. The purpose of this study is to find a more effective CPR method by comparing numerical values of CPR performed by paramedics and mechanical chest compressors on-site and in the ambulance. **Methods:** 24 paramedics were selected as volunteers. Two paramedics responded to the simulated cardiac arrest and performed CPR and mechanical CPR for 6 minutes on-site. During the 6 minutes from the ambulance to the hospital, both methods of CPR were maintained. The data was collected from March 1, 2018 to May 31, 2018. The collected data were performed with normality test, frequency, percentage, mean, standard deviation, and independent two-sample T-test using SPSS/WIN 22.0. **Results:** The hands-off time was statistically significantly higher in paramedics both on-site (t=-4.42 p=0.001) and in the ambulance (t=-7.91 p=0.000). The effective blood flow time was statistically higher in the mechanical CPR both on-site (t=3.44 p=0.001) and in the ambulance (t=7.91 p=0.000). The chest compression depth was statistically significantly higher in the CPR performed by paramedics on-site (t=3.36 p=0.002). The total number of chest compression was statistically significantly higher in the CPR performed by paramedics in the ambulance (t=2.67 p=0.000). **Conclusions:** Paramedics should be trained to perform a specialized airway method on the scene. Also, for those who are applicable for the use of machine, the mechanical CPR should be provided swiftly along with periodical observations to achieve a high-quality CPR. In addition, paramedics should be trained to reduce the hands-off time as well as a proper systematic education implementation and training.

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**PO_RES_10.06**

Balanced Factorial Experiment For the Provision of Targeted Temperature Management to Patients with Out-of-hospital Cardiac Arrest

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**Background and Objectives:** There was controversy that several patients' demographics such as sex, age or socioeconomic status was associated with the provision of targeted temperature management (TTM) among patients with out-of-hospital cardiac arrest (OHCA). This study aimed to investigate the factors that influence the decision to apply TTM to patients with OHCA. **Methods:** A balanced factorial experiment was conducted among emergency medicine physicians (EMPs). Sixteen OHCA patient scenarios with 4 balanced factors were presented. The balancing factors were dichotomous categories of patient age (45±2 years), patient sex, socioeconomic status (SES; lower vs. higher), and guardian’s attitudes regarding TTM application (positive vs. reluctant) other clinical situations were similar across scenarios. After reading each scenario, EMPs scored certainty of application of TTM to the patient (0-100). Information on participants and organizational characteristics was collected. We conducted two-way ANOVA analysis to compare certainty score for TTM application according to patients' demographics, guardians' attitude and characteristics of participants. **Results:** Seventy six EMPs completed the experiment. The median score of certainty of TTM application was 85 (inter-quartile range 70-95). The EMP response scores differed significantly for patient age group (90 vs. 80, p=0.001), SES (80 vs. 90, p=0.001), and guardian attitude regarding TTM (90% vs. 70%, p=0.001). EMPs with experiences of more than 50 times TTM application (90 vs. 80, p=0.001), EMPs with experiences of device-free TTM method (90 vs. 80, p=0.001), EMPs working in hospitals with commercialized TTM devices (88 vs. 80, p=0.001) and EMPs working in hospitals with TTM protocol (90 vs. 80, p=0.001) responded more higher certainty of application TTM. **Conclusions:** EMPs response for TTM application significantly differ from patient’factors. EMPs’ experiences for TTM application and organizational characters were associated with EMPs response for TTM application.

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**PO_RES_10.07**

Factors Associated with Survival Despite the Occurrence of Rearrest in OHCA Patients with Field ROSC: a Prospective Multiregional Study

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**Background and Objectives:** To investigate factors associated with the occurrence of rearrest after field return of spontaneous circulation (ROSC) and examine factors associated with survival despite the occurrence of rearrest. **Methods:** We conducted a prospective multiregional study for OHCA patients between August 2015 and July 2016. Patients were treated with prehospital advanced cardiovascular life support (ACLS) by emergency medical technicians who were directly controlled by medical directors (physicians) via real-time smartphone video calls [smartphone-based ACLS (SALS)]. Data were collected from prospective databases including prehospital EMS records, medical directors' records, and hospital medical records. Study populations were categorized as “rearrest (+) group” and “rearrest (-) group” contingent upon the occurrence of rearrest after field ROSC. Study populations with rearrest were also categorized as survivors or non-survivors.
vors based on their survival upon hospital discharge. Results: SALS was performed in 1,711 OHCA patients. Field ROSC occurred in 345 patients (20.2%). In the reaest (+) group [182 patients (52.8%)], the interval from collapse to first field ROSC was longer [31 (24–38) vs. 23 (16–30) min, p < 0.001] and the systolic blood pressure was lower [90 (80–117.5) vs. 110 (90–140) mmHg, p = 0.005] than in the reaest (-) group. In survivors after reaest, an initial shockable rhythm was more frequent than in non-survivors [28 (77.8%) vs. 40 (27.4%), p < 0.001]. Using multivariate analysis, a longer interval from collapse to first field ROSC [odds ratio (OR) 1.053; 95% confidence interval (CI) 1.015–1.093] and lower systolic blood pressure (OR 0.987; 95% CI 0.976–0.998) were independently related to the occurrence of reaest. An initial shockable rhythm (OR 4.512; 95% CI 1.171–17.391) was independently related to survival after reaest.

Conclusions: A longer interval from collapse to first field ROSC was associated with the occurrence of reaest and the initial shockable rhythm was associated with survival despite the occurrence of reaest.

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Optimal Cut-off Value of Serum Creatine Kinase Level For Predicting Delayed Neuropsychiatric Sequelae Associated with Acute Carbon Monoxide Poisoning

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Background and Objectives: Delayed neuropsychiatric sequelae (DNS) is one of the most dangerous complications in acute carbon monoxide (CO) poisoning patients and the primary goal of treatment CO poisoning is prevent it. Previous studies figured out initial serum creatine kinase (CK) level were significant different between DNS group and non-DNS group. In this study, we investigated optimal cut-off value of CK level to predict severe DNS following CO poisoning. Methods: This retrospective observational study included CO poisoning patients visited Hanyang University Hospital during 1 January to 31 July 2018. They were divided into two groups according to the presence of DNS defined as cognitive impairment, disorientation with characteristic abnormal pattern on diffusion magnetic resonance imaging within 6 weeks. We compared laboratory variables including initial CK of CO poisoning between two groups. The optimal cut-off value of initial CK concentration for DNS was determined via the area under the curve (AUC). Based on this, multivariate analysis confirmed that CK concentration was an independent predictor of DNS. Results: Among 152 patients, 14 patients were excluded with criteria. Of the 138 patients, 12 patients (8.7%) newly developed severe neurologic deficit after discharge within 6 weeks and treated with hyperbaric oxygen therapy according to DNS treatment. Receiver operating characteristic analyses were performed to calculate prognostic performance of creatine kinase (AUC = 0.92; 95% confidence interval [CI], 0.86–0.96) and with a cut-off value of the concentration of 1,603 U/L, severe DNS was predicted by sensitivity of 91.7% and specificity of 88.1%. In multivariate analysis, the adjusted odds ratio of CK was 51.516, which was statistically significant as an independent predictor. No significant difference was found among the other factors. Conclusions: Acute CO poisoning patient with initial CK concentrations of more than 1,603 U/L is an independent predictor of DNS expression with disorientation or cognitive impairment and hyperintense signal changes on magnetic resonance imaging within 6 weeks.

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A Stranger’s Flatus that Kills: a Case of Carbon Monoxide Poisoning

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Background and Objectives: Carbon monoxide poisoning is responsible for large numbers of unincidental domestic poisoning. The great imitator could possess clinical challenges, when exposure history is delayed or absent. Methods: A family of 8 people visited Emergency Department for two consecutive midnight. On the first night of presentation, the mother and her two children aged 6 and 7 presented with vague complaint of dizziness, mild headache and presyncopal attack. Neurological examination and laboratory investigation was unremarkable, hence all three were discharged to relatives. After 15 hours, the family tried to sleep on the second night. The mother and 2 children presented with severe headache and insomnia. The son admitted moving a portable generator inside the house due to heavy rain for the two nights. All 3 children and grandfather was admitted for observation and discharged well while the other adults were discharged to relatives.
You Eat My Flesh, I Eat Your Soul: a Case of Puffer Fish Poisoning
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Background and Objectives: Puffer fish, lethal yet regarded as a delicacy commonly found in coasts of Asian countries. It can only be prepared by a licensed puffer fish cook because it possesses a deadly neurotoxin, tetrodotoxin (TTX), 1,200 times more poisonous than cyanide. Methods: A family of seven whom runs a cafe presented to a nearby private hospital after consuming a fish brought by a customer who claims to have bought it in a market nearby. They all complained of vomiting, numbness around the mouth, weakness of all limbs and dizziness. One of them showed severe respiratory distress and was intubated and admitted to their ICU. Two others were referred to our centre due to rapidly progressive symptoms and lack of ICU beds. Both of them were fully conscious but appear agitated, still vomiting and feeling numbness around the mouth. They showed dysarthria but no signs of respiratory distress. Pupils were reactive to light, all limbs power was 3/5 and reflexes were normal. Vital signs and blood gaseous were normal. Both was admitted with supportive care and discharged the following day well. The diagnosis was clinched when a staff had captured a photo of the dish. The other four family members had mild gastrointestinal symptoms and were discharged after a period of observation. Results: Patients with puffer fish poisoning usually develop symptoms within 30 minutes to 6 hours of ingestion, with recovery usually in 24 hours. Diagnosis is mainly from patient’s sign and symptoms in the presence of positive history of puffer fish consumption. The toxin cannot be deactivated by heat, cooking, or drying as it is heat stable and water soluble. Conclusions: Recognition of puffer fish poisoning through thorough dietary history is important, which is often neglected in many busy accident and emergency departments. Corresponding Author: Naresh Kumar Sivasworn (nano8588@hotmail.com)

A Rare Case of Coma From Untreated Carbamazepine Overdose in Kenya
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Background and Objectives: Carbamazepine is commonly used worldwide to treat seizures, mood disorders, and neuropsychiatric disorders. Although it possesses an excellent safety record, clinicians should consider carbamazepine toxicity in patients with known seizure disorder or access to anticonvulsants with cerebellar symptoms, CNS depression, and signs of anticholinergic toxidrome. Methods: This is a single patient case report. A 3-year-old Kenyan girl with a history of epilepsy was admitted to her local hospital for sudden onset of ataxic gait and slurred speech. She then developed multiple generalized tonic-clonic seizures and became unresponsive; she was then transferred to the local children’s hospital. Upon presentation, she was febrile at 38.5°C, had a pulse of 140, and remained unresponsive. Pupils were equally fixed and dilated, and her gag and corneal reflexes were absent. All limbs were hypotonic and deep tendon reflexes were intact. She had absent bowel sounds and significant suprapubic distention from urinary retention. The patient was provided supportive care, including NG fluids and antibiotics. On day three mother confessed she witnessed the patient ingest 2 g of carbamazepine. Results: On day four of illness, pupils became reactive, tachycardia resolved, and she was minimally responsive to pain. Through the next several days she slowly started to recover and on day 12 she returned to her baseline and was discharged home. This case is notable because it took place in a resource-limited hospital in Kenya. We were able to observe the entire natural progression of severe carbamazepine toxicity with minimal medical interventions. In the United States, monitoring in the PICU, telemetry, electroencephalogram, intubation, and carbamazepine levels are usually done. However, in resource-poor regions of the world, these interventions are seldom available. Conclusions: This case highlights the natural course of severe carbamazepine toxicity in a resource-limited environment with a patient who fully recovered. Corresponding Author: Jacob Anderson (anderjac@upstate.edu)
Current Trends in the Care of Patients with Burn Injury
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Background and Objectives: Burns and trauma injuries are among the most frequent accidents seen during emergency care in hospital. Methods: The most frequent mistakes made in therapeutic strategy and approach to thermal trauma patients were identified by analysing the medical procedures used with patients admitted to Prague burn centre. Results: Among the main mistakes are inadequate fluid resuscitation and insufficient analgesia. One cause for a wrong approach to a burns patient is an inaccurate estimate of burns and trauma injuries that then determines the subsequent strategy for primary therapeutic procedures in urgent care in the hospital. The authors put forward a complex overview of current trends in the care of burns patients including essential changes in fluid resuscitation and analgesic therapy. Conclusions: Burn injury is one of the serious injuries that can directly affect the patient's life. Proper assessment of the severity of trauma in pre-hospital emergency care, the initiation of adequate treatment, and the transport of the patient to the burn center significantly improves the prognosis and outcome of the patient.

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DIY Tracheostomy
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Background and Objectives: Penetrating neck injury is rare but posed a daunting challenge to the attending emergency physician and ENT surgeon, especially at the centre of limited resources and far from tertiary centre. Methods: A 22 years old Burmese gentleman presented with a deep neck laceration. He was immediately triaged to Red Zone and put on supplementary oxygen. Upon inquiry, he admitted to have cut his own throat for approximately 20-12 hours prior to presentation using a pen knife. Further probing revealed that patient actually having secondary hallucination (someone instructed him to do so). The anterior neck laceration wound located at zone II, measuring 6 cm × 3 cm, revealing trachea rings and gushes of air felt from the wound. He struggled to breathe if positioned on forward neck flexion which caused the wound to close up, but comfortable on hyperextended neck position which revealed the through-and-through transverse cut of the trachea. Patient was kept in position of comfort and decided not for intubation in ED in view of the airway was still patent and not in respiratory distress. The Ear Nose and Throat and the Anaesthetic team was called in for further expert management. He was then sent to the operation theatre (OT) for endotracheal intubation in control environment, direct laryngoscopy, wound exploration, debridement and trachea repair and temporary tracheostomy creation. A temporary tracheostomy was placed below the site of injury. Urine drugs test was positive for methamphetamine. The culprit (secondary auditory hallucination) was likely due to substance induced psychosis. Results: The size of the wound and trachea cut that was large, functioning as a tracheostomy that allows air to move across it, hence patient not in respiratory distress. Conclusions: It is best to keep patient in such condition in position of comfort while getting expert help and to intubate in control environment in OT.

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Epidemiological Characteristics and Referral Patterns of Burn Cases Presenting to Lower Levels of Care in Rural and Urban Settings of the Western Cape Province, South Africa
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Background and Objectives: Burns are a serious global health issue resulting in approximately 150,000 deaths annually, most of which are occurring in low- and middle-income countries. In South Africa, burn patients met at least one of the local referral criteria for transfer and admission to burn centres, only 13% of rural cases and 11% of urban cases were referred. The low adherence to these criteria suggests that they should be revised in order to be most beneficial for both the patients and the health systems in this resource-limited context.

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Risk of Injury After Emergency Department Visit For Acute Peripheral Vertigo: a Population-based Matched Cohort Study
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Background and Objectives: Acute peripheral vertigo is common reason to present to an ED and caused by a problem in the inner ear, which controls your balance. The most common causes of peripheral vertigo are BPPV, VN, Meniere’s disease. Many medications are used to treat peripheral vertigo, including metoclopramide, benzodiazepines, anti-histamines. Vertigo identified as a risk of trauma because of inner ear problem and some medications. So, the purpose of the study was to determine whether a new exposure to acute peripheral vertigo is a significant risk factor for injury. Methods: A population-based matched cohort study using the national cohort from 2002 to 2013 was performed for those who received emergency medical care from 2004 to 2013 with primary diagnosis of acute peripheral vertigo. Five control groups were selected for each patient diagnosed with peripheral vertigo. The risk of trauma developed during the first 3 years after the emergency room visit due to peripheral vertigo was analyzed. The period of observation for 3 years is divided into 3 sections: 0-3 months, 3 months-1 year, 1 year-3 years. The primary outcome is the number of trauma, secondary outcome is a specific type of trauma. Results: A total of 808 people were included in the exposure group from 2004 to 2013 and 4,040 were included as control groups. During the follow-up period, 354 (43.8%) of the exposure group had at least one trauma, whereas 1,475 (36.5%) of the control group had trauma (p < 0.001). All other types of trauma except for abdominal trauma were significantly higher in patients with peripheral vertigo. The follow-up three-year period, increased the risk of trauma until one year after acute peripheral vertigo. Conclusions: Acute peripheral vertigo was an independent risk factor for injury and its subtypes up to one year.

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The Establishment of Trauma System in Huizhou First People’s Hospital, Huizhou, China
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Background and Objectives: Trauma is the leading cause of death and disability for children and adults aged 18-40 years in China. Huizhou First Hospital (HHF) is a 750 bed tertiary hospital in Huizhou, China. With increasing trauma-related injuries presentation, HHF wants to develop a trauma care system that will significantly improve their capacity to receive and resuscitate critically ill and injured trauma patients. In 2016, HHF collaborated with Alfred Hospital in a 3 year project to establish a trauma centre in HHF. Once the trauma centre is established, HHF shall lead and establish a network of Huizhou Trauma Centres. Methods: To establish the HHF Trauma Centre, the following steps were followed: 1. The appointment of 2 HHF Trauma Centre Directors. 2. The establishment of relevant medical and nursing exchanges. HHF clinicians and management personnel stud-
ieled as observers at AH. AH will visit HFH as advisors and educators. The rotations will specifically address trauma reception and resuscitation, neurosurgical and spinal injury care, critical care and general surgery. 3. The provision of standardised HFH Trauma Reception and Resuscitation training. 4. The establishment of the minimum dataset for Chinese Trauma Registry. Results: In 2018, the HFH trauma centre was established. The following were achieved: 1. The establishment of a trauma department. 2. Dedicated trauma bay with Trauma Resuscitation and Reception Computer Software installed. 3. Standardised HFH Trauma Reception and Resuscitation training. 4. Trauma team to receive and resuscitate trauma patients. 5. Reduction of death from traumatic pelvic injuries. 6. The establishment of trauma research program. 7. The establishment of trauma-related quality program. 8. The establishment of the minimum dataset for Chinese Trauma Registry.

Conclusion: The successful establishment of HFH Trauma Centre prove that it is possible to establish a trauma centre in China. To achieve this, the support from Huizhou Health Department and HFH’s leaders were vital. HFH now is leading a 18-hospital Trauma Network in Huizhou.

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PO_TRA_01_07
The Mortality Benefit of Trauma Patients Transferred Directly to the Trauma Center in a Regional Trauma System in Korea
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Background and Objectives: Risk of death is significantly lower when care is provided in a trauma center than in a non-trauma center and argue for continued efforts at regionalization. But in Korea, preventable trauma mortality still higher than other developed countries. The purpose of this study is to evaluate the mortality rate in trauma patients transported to trauma center and those transported to non-trauma center. Methods: From January 2014 to December 2016, we performed a Prospective cohort study with retrospective analysis the patients who enrolled in NEDIS (National Emergency Department Information System). We evaluated the ICISS (ICD-derived Injury Severity Score), and a Survival risk ratio. We compare the survival risk ratio between trauma center group and non-trauma center group, in same ICISS group. Results: Among the 3,666,672 patients who enrolled NE- DIS, trauma patients accounted for 438,082 after exclusion. Among the 438,082 patients, 23,628 patients had been transferred to directly trauma center, 414,454 patients had been transferred to directly non-trauma center. The proportion of males to females was 65.6%, and the mean ICISS was 0.9229. The leading cause of trauma was motor vehicle accidents. Conclusions: Care in the those direct transferred to trauma center may be more benefit at mortality rate in this study. In moderate risk group (0.25 ≤ ICISS <0.75) and low risk group (0.75 ≤ ICISS), there is more benefit at mortality rate in those in direct TC group to trauma center than those in indirect TC group.

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PO_TRA_05_02
Trauma Management Concept and Emergency Service in Egypt
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Background and Objectives: Although Trauma Surgery started as a subspecialty either to General Surgery or Orthopedic Surgery, now many countries try to consider it as a separate specialty with two main models, the USA model “Acute Care Surgery” as two year fellowship following the five year General Surgery residency and the German model as an orthopaedician with special training in trauma centers. In Egypt the condition still vague as the trauma surgeon is substituted by the general surgeon in most of cases. Mansoura University started in 1992 as a sub-unit from General Surgery with complete independent clinic and separate residents shifts, Tanta University followed in 2008 but with only junior staff, outside universities, there was a very strong start by Ahmed Maher Teaching Hospital in 2013 with completely well trained juniors and seniors staff and monthly held meeting seminars. Methods: A study based on university catalogs for all Egyptian Universities, historical records and official publications about Trauma Surgery in Egypt. Results: Two Egyptian Universities and one teaching hospital belongs to the Egyptian Ministry of Health, started the program with a lot of obstacles, either due to lack of funding or strong refusal from surgical specialties in order not to lose their traditional power in trauma and emergency cases management. Till now no separate academic degree in Egypt i.e. master, doctorate or board in trauma surgery and no academic career promotion. Two academic international conferences for Emergency Surgery and Traumatology were held in 2014 and 2015 consecutively and organized by Mansoura University. Conclusions: Egypt is still far from the worldwide model of trauma surgery as a specialty with some individual efforts to establish the career.

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Comparison of Clinical Profile and Outcome of Trauma Patients Presenting During Regular vs. Off Hours at Emergency Department of Urban Tertiary Hospital in Tanzania
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Background and Objectives: Disproportionately Low Income Countries (LIC) has higher trauma burden than Higher Income Countries (HIC) and relatively poor outcomes. Timing of presentation to the hospital such as regular work hours vs. off hours have shown to impact outcomes in trauma in HIC. In Tanzania the timing of presentation in trauma has never been investigated. Methods: This was a prospective comparative descriptive study of adult trauma patients presenting to EMD-MNH from July 2017 to December 2017. Online data capture software was used to document patients’ demographics, clinical characteristics, care received and outcomes. Primary outcomes were difference in clinical presentation and EMD care and secondary outcomes were mortality, length of hospital stay and disposition. Student’s t-test (t-test) was used for comparison of mean and descriptive categorical data was analyzed using Chi-square (χ²). Results: We enrolled of the population. Results: From 22,117 cases presenting to the UTH-K ED a random sample of 786 trauma patients were studied. The median age was 28 (IQR: 6-50) and 69.4% were male. Road traffic accidents (RTA) were the most common MOI at 49.4% followed by falls (23.9%) and penetrating trauma (10.9%). The most frequent types of injuries were fractures (46.2%). The most common anatomical region of injury was craniofacial (36.3%). Lower and upper limb injuries constituted 35.8% and 27.1% of anatomical regions injured respectively. Spinal and pelvic injuries accounted for similar percentages of injuries at 7.4% and 7.5% respectively. Among trauma patients ED blood product transfusion were given to 3.9% of patients and 31.4% received crystalloids. Among trauma patients sampled 68.2% required hospital admission, with 23.3% to the orthopedic service and 19.2% to the surgical service. Conclusions: Blunt trauma accounted for the majority of presentations, and RTAs were the predominant MOI. Approximately two-thirds of patients required hospital admission and one-third required resuscitation with either crystalloids or blood products. These findings suggest that the trauma population in the setting studied have substantial injury burdens and further study of treatment interventions could provide positive impacts in injured populations at UTH-K.

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1,395 (49%) patients from 2,898 trauma patients who presented to the ED. Of those enrolled 818 (58.6%) presented during off hours. The median age of presentation of those enrolled was 33 years (interquartile range 26-44 years) and overall 1,069 (76.6%) were male. Overall 1,261 (90.4%) had minor Injury Severity Score (ISS) and 98 (7.0%) had moderate ISS, while 36 (2.6%) had major ISS. Among 36 (2.6%) with major injury (ISS ≥ 15), 3 (0.5%) presented during regular hours vs. 33 (4.0%) during off-hours (p < 0.001). Overall 40 (2.9%) had used alcohol, and the majority of these 35 (4.3%) presented during off hours vs. 5 (0.9%) of regular hours (p < 0.001). Overall 24 hour mortality was 2 (0.1%) with 2 (0.2%) presenting during off-hours and none died during regular hours, p = 0.235. Conclusions: Off-hour presentation was associated with high male proportion, major trauma and injuries associated with alcohol influence. Even though these factors did not seem to impact on the ED and 24h mortality, clinicians are to be keener due to higher acuity and severity of patients presenting in off-hours in LIC.

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**PO_TRA_05_04**

**An Audit on Use of Analgesics in Trauma Victims Presenting to a Tertiary Care Hospital in Sri Lanka**

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**Background and Objectives:** Pain management found to be inadequate in accident and emergency departments around the world. To assess the use of analgesics to patients presented to accident service of Colombo South Teaching Hospital (CSTH) during first hour of presentation, identify short comings of pain management and institute a locally acceptable analgesia protocol. **Methods:** Audit was conducted in three phases. Current analgesic practice was assessed in the first phase. In the second phase instituted a locally acceptable analgesic protocol. In the last phase analgesic practice was reassessed. The audit was conducted over a three-month period in 2016. Patients more than 6 years of age with skeletal fractures presented to CSTH within 4 hours of incident were included. One hundred patients each were assessed in both pre and post intervention using a preformed checklist. Pain was assessed using visual analogue scale. **Results:** The pre and post intervention samples were of nearly equal characteristics considering fracture types. In the pre-intervention group 10 did not received any analgesics and 64 received only oral analgesics. None of the patients received intravenous (IV) opioids and 2 received intramuscular opioids. Considering the pain score 52 patients complained pain score of ≥9, with the mean pain score of 7.65. After the intervention use of oral analgesics was reduced to 26 cases (p < 0.001). IV opioids have been used in 27 patients. Also, higher use of regional blocks were observed after intervention (n = 18), with 7 did not received any analgesics within first hour. Post intervention group had a mean pain score of 5.13 (p < 0.001), but with 12 patients having pain score ≥ 9. **Conclusions:** Interventions should be done to improve pain management practices during the initial management of trauma victims. Even after intervention there was a room for improvement which repeated programmes to improve acute pain management.

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**PO_TRA_05_05**

**Epidemiological Characteristics of Emergency Department Visited Adolescence Patients with Violent Injury in Korea**

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**Background and Objectives:** Recently, adolescent violence issue has been spiked up in social interest in Korea. This study aimed to identify risk population for adolescent violent injuries and their injury characteristics. **Methods:** We conducted the secondary analysis using Emergency Department-based Injury In-depth Surveillance (NEDIS) database. We included adolescent patients (from 6 to 17 years of age) with blunt trauma except road traffic injury or fall from January 1, 2013 to December 31, 2016 in Korea. To compare violent injury and unintentional injury, we excluded patients with self-harm or suicidal injury. We evaluated the epidemiological characteristics of ED visits with violent injury (EDVs-VI) according to school age group. Multivariable analysis was conducted to estimate risk on ED-Vs-VI. We also conducted location-stratified analysis (school vs. non-school injury). **Results:** A total of 45,336 adolescent with other blunt injury visited EDs. The EDVs-VIs accounted 11.2%. As age increased the proportion of EDVs_VI also increased (1.9%, 4.2%, 16.3%, and 25.9%, respectively). Yearly comparison of the injury did not show any trend in EDVs-VI. The peak onset times for EDVs-VIs remained 10 PM contrast the peak onset time of unintentional injury was 6 PM. Multivariate regression identified the risky age groups as middle school-aged (OR: 10.7, 95% CI: 9.4-12.1) and high school aged (OR: 19.1, 95% CI: 16.9-21.7). In school, risk of middle school-aged group is as high as that of high school aged group and high school aged group (OR: 10.2, 95% CI: 8.8-13.7 vs. OR: 9.8, 95% CI: 7.6-13.3). **Conclusions:** Adolescent ED visits due to injuries of violent nature showed different epidemiological characteristic from that of non violent nature. The at-risk age group for EDVs-VIs differ by location of injury.

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**PO_TRA_05_06**

**Suboptimal Management with Good Intentions-a Case of Pretrial Laceration in Young Adult Patient**

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**Background and Objectives:** Pretrial lacerations are common in elderly population, but are seldom seen in young patients. With no established objective criteria, the management of the injury varies. **Methods:** We present a case of delayed definitive treatment in a 32 years old male, with no significant past medical history, who accidentally fell into an uncovered sewage hole and sustained 4 cm oblique right pretibial laceration. This was complicated by an underlying cortical breach at the distal tibial shaft. Due to distracting pain on the ankle and foot, the fracture and debris of bony fragments which were not clearly shown on the anteroposterior or view of lower limb X-rays were not appreciated by the attending doctors. Wound toileting and primary closure under local anaesthesia were performed on the day of visit. **Results:** The patient sought re-attendance due to worsening pain and impaired mobility one week later. He was admitted to the Orthopaedic Department with the diagnosis of wound infection and retained foreign body. He received 5 days of intravenous antibiotics, wound debridement under general anaesthesia and secondary closure. Advice was also given to avoid weight bearing for 1 week till outpatient review in view of skin tension of the wound. **Conclusions:** Retrospectively, it was likely that knowledge gaps, distracting injuries, the atypical presentation of fracture, foreign bodies as well as patient’s young age had led to cognitive errors of the attending doctors.

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**PO_TRA_05_07**

**Prognostic Factor For Sepsis in Traumatic Patients**

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**Background and Objectives:** Many patients die from sepsis and multiple organ failure, even after primary surgery by trauma. Early diagnosis of sepsis in traumatic patients is important and used in various ways, such as CRP and WBC, but it is incorrect. Recently, procalcitonin (PCT), macrophage migration inhibitory factor (MIF) have emerged as predictive factors. Our study aims to explore the significance of PCT and MIF as a predictor of sepsis in trauma patients. **Methods:** This study was conducted on prospective observational study patients who visited an emergency medical center in a university hospital from March 2014 to February 2016 and were intended for severe trauma patients aged 15 or older. We measured the WBC, the CRP, the lactate, PCT, and MIF. **Results:** There were 132 patients in the study, 112 men, 20 women, and mean age were 48.2 ± 8.8 years old. The mean injury severity score (ISS) was 18.1 ± 7.6, the high ISS group (ISS ≥ 15) had 58 patients and the low ISS group (ISS < 15) had 74 patients. The high ISS group had a higher MIF, lactate and PCT than the low ISS group. There were 38 post-traumatic sepsis patients, 28 of whom were in the high ISS group and 10 from the low ISS group. MIF showed statistically high levels in sepsis patients among severe traumatic patients. **Conclusions:** ISS > 15, MIF, and PCT are possible as predictors of sepsis in severe trauma patients. However, further studies are needed as MIF, PCT is increased depending on the severity of the trauma.

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Knowledge and Attitudes of Kenyan Doctors Toward Stroke Management in Nairobi Hospital

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Background and Objectives: Acute ischemic stroke has increasingly become a leading cause of death and disability in Africa. Emergency physicians play a pivotal role in the stroke system of care. The quick recognition of stroke patients eligible for thrombolysis in the emergency department, fast triage, neuro-imaging, and timely referral to the stroke team depend on the emergency physicians. In Kenya, the field of emergency medicine is still in its infancy and thus a majority of the emergency departments have senior house officers (SHO) serving the purpose of emergency physicians with supervision from emergency consultants. As a result, the SHOs are expected to be versed in the latest stroke management guidelines, lack of which, negatively affects the delivery of effective stroke care. Here we aimed to assess the knowledge and attitude of the SHOs working in The Nairobi Hospital emergency department towards stroke management and the use of a stroke protocol. Methods: A web-based, self-administered, locally designed survey was sent to all SHOs working in The Nairobi Hospital emergency department from November to December 2018. Results: Out of the 80 senior house officers, 48 participated in the survey, with a 60% response rate. Only 60% of them were comfortable managing an acute stroke patient. The average score for the questions assessing knowledge in acute stroke management was 29%, 17% admitted to using the available stroke protocol despite only 9% not preferring to use it. The main barriers to protocol usage cited were inaccessibility (63%), unawareness (30%) and perceived limited time while managing an acute stroke (30%). Conclusions: Our study detected inadequate knowledge and a negative attitude among the SHOs toward using the stroke protocol. This might negatively impact patient outcome. Therefore, we recommend developing urgent strategies to improve physicians’ knowledge, attitudes, and beliefs in the management of acute stroke.

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When a Good Drug Goes Bad: Alteplase Induced Angioedema For Acute Stroke

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Background and Objectives: For the last 18 years, since approval in 1996, recombinant tissue plasminogen activator has been used and accepted widely as the treatment for acute ischemic stroke. It promotes restoration of the cerebral blood flow and improves stroke outcome. It has undergone numerous studies, and is considered to be effective and safe. However, like all drugs, rTPA has adverse effects. This report describes a case of a patient who developed angioedema and anaphylaxis after receiving recombinant tissue plasminogen activator (rTPA) for acute ischemic stroke. The objective of this study is to review the possible mechanisms responsible for current treatments available. Methods: Case Report. Results: None. Conclusions: In summary, tissue plasminogen activator induced angioedema and anaphylaxis are rare yet morbid adverse reactions. There were few cases that have been reported relating to the incidence of angioedema and anaphylaxis with the use of this common stroke therapy. Orolingual angioedema is one life-threatening complication of alteplase treatment. Currently, there are limited studies regarding the proposed mechanism for its activation, treatment and definitive management for tissue plasminogen activator induced angioedema. This report contributes to the growing literature on the possible mechanisms responsible for current treatments available.

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Aortic Dissection—a Case of Atypical Presentation and Valuable Lesson to Learn

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Background and Objectives: Aortic dissection is a relatively uncommon emergency condition where there is a separation of the inner layer of the aorta. Patient usually presented with the classic ‘tearing’ and ‘excruciating’ chest pain or pain between the shoulder blades. In some cases, the symptoms may mimic acute coronary syn-
Background and Objectives:

One of the most commonly recommended investigations in Emergency Departments (ED) is an Electrocardiogram (ECG). Numerous books have been published on ECG interpretation, but few cover ECG lead misplacement. This study aimed to identify the prevalence of ECG lead misplacement and its consequences. The secondary aim was to identify how many ECGs were misfiled in another patient’s notes.

Methods:

Between December 16th 2017 and December 15th 2018, 230 ECGs with lead misplacement were identified. The misplacement was recorded in departments and wards other than the ED. The most frequent misplacement was by far the most prevalent 49 (40.9%). Other limb lead misplacements identified were right arm-left arm 71 (30.9%), left arm-left leg 15 (66%), right arm-left leg 11 (4.8%), and right arm-right leg 10 (4.3%). Left arm-right leg was the least common misplacement 4 (1.7%). 38 (14.2%) of all ECGs with limb lead misplacement were filed in the incorrect patient's notes.

Conclusions:

Left arm-left leg misplacement is far more common than previously stated [1]. An alarming high number of ECGs (38) were misfiled in another patient’s notes. This is the first study that I am aware of that looks at an entire hospital’s prevalence of ECG lead misplacements. Education and training are urgently needed to dramatically reduce the numbers of lead misplacements.

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Blood Transfusion, Mortality and Hemoglobin Level: Associations among Emergency Department Patients in Kigali, Rwanda

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Background and Objectives:

Studies from high-income countries support restrictive blood transfusion thresholds in non-trauma patients. However, in low- and middle-income countries (LMICs) the etiologies of anemia and baseline health status differ greatly. Optimal transfusion thresholds are not known. This study evaluated the association of medical blood transfusion with mortality outcomes level among emergency department (ED) patients in Kigali, Rwanda.

Methods:

This retrospective cohort study was performed using a database of randomly sampled patients presenting to the ED at the University Teaching Hospital of Kigali (UTHK). Patients >15 years of age treated for non-traumatic emergencies during 2013-16 with available ED Hb measurements were included. The relationship between ED blood transfusion and all-cause hospital/emergency department mortality was evaluated using multivariable logistic regression to generate adjusted odds ratios with associated 95% confidence intervals. Results: Of 3,669 cases sampled, 1,116 met inclusion. The median age was 42 (IQR 29, 60) and 45.2% were female. ED transfusion occurred in 12.1% of cases. Percent mortality was higher among those receiving transfusions as compared to those not, although not statistically significant (23.7% vs. 17.0%, p=0.06). Mortality was not significantly different for those receiving blood vs. those not for any Hb category: Hb <7.0 g/dL (20.5% vs. 16.2%, p=0.65); Hb 7.0-9.9 g/dL (30.0% vs. 20.0%, p=0.16); Hb >10 g/dL (23.5% vs. 16.4%, p=0.46). In a multivariate logistic regression analysis controlling for gender, age, final diagnosis, Hb level, and the Triage Early Warning score, there was no significant difference in mortality between patients receiving and not receiving blood transfusion (OR=0.72; 95% CI: 0.23, 2.37).

Conclusions:

In this population, no mortality benefit from transfusion was observed, though this may be due to confounding by indication, as more severely ill patients were more likely to receive transfusions. These preliminary results support the need for further study of ED transfusion thresholds in LMICs.

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She was started on Carbimazole 40 mg daily. Later, after 3 weeks of starting treatment, she presented to ED with symptoms URTI and discharged on symptomatic treatment. However, she came back with worsening symptoms, Routine blood investigations done and revealed severe leucopenia with absolute neutropenia (Neutrophil count was 0). Results: Management and Outcome: Carbimazole was discontinued and she was admitted as febrile neutropenia. Other immunological tests were done to investigate agranulocytosis cause, and came negative. Her neutrophils count recovered after 2 weeks. Conclusions: Although uncommon, Agranulocytosis is a serious complication induced by Carbimazole. We recommend routine full blood count follow up for patients newly started on Carbimazole.

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A Rare Case of Mycotic Supra Renal Aneurysm
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Background and Objectives: Mycotic aneurysms of the suprarenal aorta are rare lesions accounting for less than 1% of aortic reconstructions for aneurysmal disease. Among aortic locations, aneurysms of the suprarenal aorta are less frequent than those of infrarenal origin. This is a case of successfully treated mycotic supra renal aneurysm likely secondary to aortitis vs. cholecystitis as primary source or infection from different site resulting in bacteremia with seeding of the atheromatous plaque. Methods: Case report: 75 yr male presented to emergency department with 1 week of colicky abdominal pain with fever and no vomiting. Blood result showed leukocytosis and x-ray showed signs of large bowel obstruction. CT scan of abdomen revealed suspicious for aortitis and mycotic pseudoaneurysm in the abdominal aorta which on CT Aortogram demonstrated two focal, non-leaking, outpouchings along the posterior wall of the suprarenal abdominal aorta. Patient underwent aortic stenting with good flow of blood noted into the SMA, celiac axis, bilateral renal arteries. Results: MA represent a life-threatening condition with significant morbidity and mortality, accounting for approximately 0.8–3.4% of aortic aneurysms. MA develops after an episode of bacteremia or septic emboli. The most likely organisms are Salmonella, Staphylococcus aureus and Streptococcus. Fever and leukocytosis are usually the first findings in 70% of cases, with a palpable aneurysm or back pain constituting the third part of a classic triad of symptoms. However, several patients have presented with nonspecific abdominal or chest pain and no distinctive clinical features. The symptoms of sepsis may be discrete and may easily go unrecognized, especially in the early stages. Conclusions: For Emergency physician, early diagnosis is the cornerstone of effective treatment. Without medical or surgical management, catastrophic hemorrhage or uncontrolled sepsis may occur, so a high index of suspicion is required to make the diagnosis.

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Incidence of Bacteremia, Antibiotic Resistance and Other Associated Factors among Infectious Patients Transferred From Long-term Care Hospitals
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Background and Objectives: To evaluate the incidence of bacteremia, antibiotic resistance, and other associated factors among infectious patients transferred from long-term care hospitals (LTCHs). Methods: Overall, 422 patients were enrolled retrospectively. The primary outcome was the incidence of pathogenic bacteremia. The secondary outcomes were R1, R2, and R3. Bacteremia caused by microorganisms that were resistant to penicillin or first, second, or third generation cephalosporins were grouped as R1. Bacteremia caused by microorganisms that were resistant to vancomycin, carbapenem, linezolid, teicoplanin or colistin were grouped as R3. Baseline characteristics, comorbidities, physiologic and laboratory variables were collected. Results: The incidence of bacteremia was 20.4% (n = 86). The most frequent pathogen was E.coli (n = 25) followed by S.aureus (n = 10), S. epidermidis (n = 8), and K pneumonia (n = 6). The incidences of the R1, R2, and R3 groups were 16.8% (n = 71), 14.4% (n = 61), and 1.4% (n = 6), respectively. Of The Gram-positive pathogens (n = 44), the R1, R2, and R3 groups were 84.1% (n = 37), 75.0% (n = 33), and 9.1% (n = 4), respectively. Of the Gram-negative pathogens (n = 46), the R1, R2, and R3 groups were 82.6% (n = 38), 69.6% (n = 32), and 4.3% (n = 2), respectively. Initial serum procalcitonin level was significantly associated with the presence of bacteremia (AOR 1.03, 95% confidence interval 1.00-1.05, p = 0.004), R1 (1.04, 1.01-1.07, p = 0.005) and the R2 group (1.04, 1.00-1.06, p = 0.022). There was no significant difference in the incidence of bacteremia involving the R1, R2 or R3 group among top five hospitals. Conclusions: Approximately one of five infectious patients transferred from LTCHs was bacteremic. Most of the pathogen were R2 group. Procalcito- nin was a significant indicator for total bacteremia, the R1 and R2 group, respectively.

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Adequacy of EFAST in Traumatic Leaking and Dissecting Abdominal Aortic Aneurysm
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Background and Objectives: Common presenting symptoms of dissecting or leaking abdominal aortic aneurysm are abdominal pain, backpain and in shock. In emergency setting, we will look for aortic aneurysm if patient presented with abdominal pain or in shock. And in trauma, it is a standard we practice EFAST in Primary survey. Here we reported an uncommon case of leaking and dissecting abdominal aorta aneurysm which induced by trauma in which might be missed as the patient had stable vital signs. Methods: We report a 67 years old gentleman, brought to emergency department of district hospital as he was assaulted by his son with a handsh. His wife was triage to redzone as she was in shock and massive bleeding. As the patient was stable and no significant wound or bleeding, he was triage to Yellow zone (semi critical) for further assessment. His vital signs was stable with BP 153/107, heart rate 68 bpm, sPO2 100% on room air. He only complained of left leg pain. EFAST was done in primary survey assessment and was negative. Since patient had severe leg pain with no significant fracture, but the legs looked mottled, we did ultrasound of the aorta which revealed abdominal aorta size of 6 cm with intramural thrombosed. There was minimal fluid surrounding the aorta. Patient was then transferred to tertiary hospital for futher assessment and management. He was stable throughout the journey. Results: CTA findings stated that the patient had supraprenal and infrarenal false form aneurysm with leaking complicated with thrombosis of bilateral main renal artery and inferior mesenteric artery. Conclusions: Limiting use of EFAST alone might missed atypical leakage/dissecting AAA. We suggesting that in some selected case in trauma, EFAST alone might not be sufficient. Attention to subtle clues points towards another pathology helps not to tunnel vision on EFAST alone,allowing to see the bigger picture.

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Inter-observer Reliability in Assessing Intracerebral Hemorrhage Shape as Ellipsoidal vs. Non-Ellipsoidal: a Comparison Between Emergency Physicians and Emergency Radiologists Assessment
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Background and Objectives: We aimed to determine the level of agreement between multiple raters’ assessments of ellipsoidality. Methods: This was a prospective interpretation study of head CT scan examinations in an emergency department. Seven raters, two emergency radiologists, an EM attending, a senior and a junior EM Fellow (EMF), and a senior and a junior EM resident (EMR) independently reviewed all the CT scans on SanteDICOM image viewer. The participants were asked to categorize bleed shape as ellipsoidal vs. non-ellipsoidal. The inter-observer agreement was assessed through kappa (κ) and reported with 95% confidence interval. Analyses were executed with Stata (Quad core, 15MP, StatCorp, College Station, TX). Results: Out of 100 CT scans, 90% (90/100) belonged to male population with median age of 50 years (IQR 43 to 57). The bleeds were categorized as ellipsoid in 37 out of 100 CT scans by the index radiologist. The inter-observer agreement was 0.32; senior EMR, 0.24 (0.11 to 0.39); junior EMR: 0.35 (0.21 to 0.5). Conclusions: Although uncommon, Agranulocytosis is a serious complication induced by Carbimazole. We recommend routine full blood count follow up for patients newly started on Carbimazole.

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Interobserver Reliability in Assessing Intracerebral Hemorrhage Shape as Ellipsoidal vs. Non-Ellipsoidal: a Comparison Between Emergency Physicians and Emergency Radiologists Assessment
Raheel Qureshi
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Background and Objectives: We aimed to determine the level of agreement between multiple raters’ assessments of ellipsoidality. Methods: This was a prospective interpretation study of head CT scan examinations in an emergency department. Seven raters, two emergency radiologists, an EM attending, a senior and a junior EM Fellow (EMF), and a senior and a junior EM resident (EMR) independently reviewed all the CT scans on SanteDICOM image viewer. The participants were asked to categorize bleed shape as ellipsoidal vs. non-ellipsoidal. The inter-observer agreement was assessed through kappa (κ) and reported with 95% confidence interval. Analyses were executed with Stata (Quad core, 15MP, StatCorp, College Station, TX). Results: Out of 100 CT scans, 90% (90/100) belonged to male population with median age of 50 years (IQR 43 to 57). The bleeds were categorized as ellipsoid in 37 out of 100 CT scans by the index radiologist. The inter-observer agreement was 0.32; senior EMR, 0.24 (0.11 to 0.39); junior EMR: 0.35 (0.21 to 0.5). Conclusions: Although uncommon, Agranulocytosis is a serious complication induced by Carbimazole. We recommend routine full blood count follow up for patients newly started on Carbimazole.

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for categorizing ICH bleeds as ellipsoidal vs. non-ellipsoidal.

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PO_PED_03_07

Levels of Agreement For Intracerebral Hemorrhage Volume Estimation Using ABC/2: a Comparison Between Emergency Physicians and Emergency Radiologists Assessment

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Background and Objectives: We aimed to define levels of agreement (LOA) between emergency radiologists (ER) and emergency medicine (EM) physicians for estimating bleed volume using the ABC/2 formula. Methods: This was a prospective interpretation study of head CT scan examinations in an emergency department. Two ERs, an attending senior and a junior EM Fellow (EF) and a senior and a junior EM resident (ER) independently reviewed the scans. Two perpendicicular maximal dimensions (A and B) were measured on an axial CT image and “C” dimension was the multiplication product of slice thickness and number of slices with a visible bleed. All analyses were executed with Stata (Quad core, 1SMR, StataCorp, College Station, TX). Results: Out of 100 Ct scans, 90% (90/100) belonged to male population with median age of 50 years (IQR 43 to 57). The median bleed volume was 11.2 mL (IQR 6.6–18.6). The mean of differences for estimated volume between the index radiologist and the raters were [inter, mean (95% CI) in milliliters]: as: second ER, 1.19 (1.14 to 1.24); EM attending, 1.05 (0.98 to 1.13); senior EM, 1.05 (1.00 to 1.10); junior EMF, 1.19 (1.06 to 1.33); senior EMR, 1.29 (1.19 to 1.39); junior EMR, 1.11 (1.03 to 1.20). Conclusions: In an urban academic ED, an excellent level of agreement was found between emergency physicians and emergency radiologists for estimating the ICH bleed volumes using ABC/2 formula.

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Factors Associated with Better Outcomes of Out-of-hospital Cardiac Arrest in Schoolchildren: School Hours Are Not an Independent Factor Associated with the Outcomes

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Background and Objectives: Schools are responsible for the management of out-of-hospital cardiac arrest (OHCA) in schoolchildren. Automated external defibrillators (AEDs) are installed at school in combination with CPR training in Japan. This study aimed to investigate whether school hours are associated with better outcomes of schoolchildren with OHCA. Methods: From the 2005–2014 nationwide databases, we extracted the data for 1,660 schoolchildren (6–17 years) with bystander-witnessed OHCA, managed without any involvement of physician. Univariate analyses followed by propensity-matching procedures and stepwise multivariate logistic regression analyses including major factors known to be associated with outcomes were applied. School hours are defined as 8:00 am to 6:00 pm. School days in each prefecture were determined by excluding weekends, national and school holidays. Results: The neurologically favorable 1-month survival during school hours was better than that during non-school hours only on school days. During school hours on school days, OHCA patients more frequently received bystander cardiopulmonary resuscitation (CPR) and public access defibrillation (PAD), and had a shockable initial rhythm and presumed cardiac etiology. The survival rate during school hours on school days was not significantly improved during the study period despite the increased incidence of PAD. Furthermore, the survival rate did not significantly differ between school hours on school days and others after propensity score matching: 16.4% (60/366) vs. 16.1% (59/366), p=0.83. Stepwise logistic regression analysis during school hours in school days revealed that shockable initial rhythm (adjusted OR; 95% CI; 3.32;1.24–6.48), PAD (3.32;1.23–9.10), non-exogenous causes (2.78;1.18–6.67), and shorter emergency medical service (EMS) response time (1.15;1.02–1.32) and witness-to-first CPR interval (1.07;1.01–1.15) were major factors associated with improved survival. Conclusions: School hours are not individualistically associated with improved outcomes of OHCA in schoolchildren. Early bystander and EMS-performed basic life support based on sufficient preparedness may improve the outcomes.

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Variation in Intensive Care Practices For Moderate to Severe Traumatic Brain Injury: a Multi-national Initiative

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Background and Objectives: Moderate to severe traumatic brain injury (TBI) in childhood is a serious diagnosis with a risk of death and potentially severe long-term neurodevelopmental deficit. Objectives(1) Examine the injury epidemiology and outcomes of children presenting with head injuries,(2) Study the variation in the clinical management of paediatric traumatic brain injury (TBI) in pediatric intensive care units (PICUs) across Asia. Methods: Design and Setting: Retrospective chart review performed in participating Pediatric Acute & Critical Care Medicine Asian Network (PACCMAN) centres between July 2014 to June 2017. The data collection is performed using a standardised electronic data form with the variables explored a priori.Patients: All children <16 years old who present within 24 hours of head injury with GCS ≤ 13 and admitted to the PICU. Trivial injuries and all children 16 years old and above are excluded. Variables: The following are recorded: Primary mechanism of injury, results from the computed tomography (CT) brain and type of neurosurgical intervention. Management of TBI: Endotracheal intubation, use of hypervolemic therapy, anti-epileptics, sedative and paralytic medications, and temperature control. Among those with intracranial monitoring, intracranial pressure (ICP) and cerebral perfusion pressure (CPP) values are documented.Main outcome measures: The primary outcome measures are: Death, 14-day ventilation-free days, 14-day ICU-free days, and 28-day hospital-free days. Results: There are 12 centres in Singapore, Malaysia, China, Japan, Thailand, Hong Kong and Philippines participating in this study. There is a diverse patient population being recruited. Conclusions: A significant proportion of severe paediatric head injuries occur in Asia, yet surveillance in this region remains inadequate. This first collaboration among the intensive care units in Asia will facilitate a common platform for data collection on moderate-severe traumatic brain injuries and motivate future prospective studies.

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O God! Please Give Me Back My Sight: a Case of Cortical Blindness in a Child with Acute Glomerulonephritis

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Background and Objectives: Posterior reversible encephalopathy syndrome (PRES) refers to a clinico-radiological entity characterized by headache, confusion, visual disturbances, seizures and posterior transient changes on neuroimaging. It represents a localized manifestation of hypertensive encephalopathy occurring secondary to hypertensive crisis. We report a child with PRES revealing post-streptococcal Acute Glomerulonephritis (AGN). Methods: He was a 11 year old boy who presented with sudden loss of vision both eyes 12 hours prior to admission. He had history of sudden onset of headache for 2 days with few episodes of vomiting. No history of seizure, fever or trauma. He was referred from a district hospital for urgent CT brain to rule out space occupying lesion. On examination, he was afibrile and comfortable. His BP was 135/85 (above 95th percentile). Other parameters were normal. His pupils were bilateral equal and reactive to light, with normal fundus examination. He had no other focal neurological deficits and had no signs of any meningeal irritation. Other systemic examinations were normal.

Results: UFEFE showed RBC 4+ and protein 2+. CT brain at admission showed areas of hypodensity in the bilateral occipital lobes white matter with
Acute Necrotizing Encephalopathy of Childhood with H1N1 Influenza Presenting to a Tertiary Adult Hospital: a Case Report

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Background and Objectives: Acute necrotizing encephalopathy is a rare but distinctive type of acute encephalopathy with global distribution. In the most severe cases of influenza-associated ANE, patients develop altered mental status with or without seizures and then rapidly progress to a comatose state within a mean of 24–72 hours from the onset of fever and upper respiratory symptoms. Here, we report a case of a pediatric patient who has presented to an adult tertiary hospital with febrile status epilepticus and was subsequently transferred to a pediatric hospital for further management in Singapore with good neurological outcomes.

Methods: - N.I.L. - Results: A 10-year-old Burmese boy with no significant medical history was presented to our hospital with temperature at >41 Degrees Celsius and generalized tonic-clonic seizure while at home for 20 minutes. GCS upon arrival was E3V1M5. However, there was eye deviation to the left side and stiffening of all 4 limbs. Antipyretics and anti-epileptics were given immediately. CT brain was negative and initial bloods were unremarkable. Patient remained hemodynamically stable upon transfer to pediatric ICU of KK Women's and Children's Hospital. Subsequently, MRI showed heterogeneous enhancement in the bilateral thalami and hemispoen; given the clinical picture with a positive respiratory PCR swab for H1N1, it pointed towards ANEC. CSF analysis all came back negative. He was started on 5 days of pulsed methylprednisolone and 1 dose of Tocilizumab. He was discharged on weaning dose of prednisolone for 1.5 months in view of persistent right distal lower limb hypotension and weakness. Repeat MRI was normal and he has since recovered fully.

Conclusions: ANEC is defined as acute encephalopathy following a nonspecific viral febrile illness and is rapidly progressive with significant morbidity and mortality. Survivors usually exhibit at least short-term neurologic sequelae. There is no definite proven treatment therefore intensive supportive therapy with good neurological rehabilitation program has been recommended.

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The Unfortunate Balloon Boy

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Background and Objectives: Foreign-body aspiration is accounted for more than 90% of childhood death in children less than 5 years old and 65% of the victims are infants.

Methods: A 2 years old boy was brought to Emergency Department for unresponsiveness after an episode of fall. Initial history mentioned that the child had knocked himself towards wall when he was running. Upon assessment, child was apnoeic, no spontaneous breathing with no palpable femoral pulse. CPR commenced immediately and intubation was performed. There was no foreign body visualized at vocal cord during intubation. He was given IV adrenaline and fluid boluses as appropriate for his weight, yet unfortunately was not able to be revived. We subjected him for post mortem investigation. The result revealed red colour latex balloon in patient’s gastric cavity with asphyxia changes evidenced from the lungs. Further history taken from his mother confirmed that the child was playing with balloon before he eventually fell and became unconscious.

Results: Latex balloons are primary cause of nonfood-related choking deaths reported to the United States Consumer Product Safety Commission (CPSC). Latex balloon is dangerous because it is smooth and conform to the trachea, blocking the airway and making it almost impossible to expel with the Heimlich maneuver.

In this case, the child was brought to hospital after 1 hour delay with no basic life support initiated by the family member. This significantly reduce the chance of survival in this patient. The balloon is believed to dislodge after effective chest compression initiated at emergency department.

Conclusions: Latex balloon can be a hazardous to a child who accidentally choke on it. Parents should always keep those small and potential choking agent away from their children. Proper education of basic life support for parents are deemed essential to increase the chance of survival in case of choking incidence shall happen.

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Feasibility of Nasal Bubble CPAP in Managing Children under Five Years Presenting with Respiratory Distress to an Urban Emergency Department in Tanzania

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Background and Objectives: Mortality from respiratory illnesses among children in low-income countries is high partly due to lack of appropriate treatment options like ventilatory support. Nasal bubble CPAP (bCPAP) is a less expensive alternative than conventional CPAP. We determined the feasibility of nasal bCPAP in managing under-fives with respiratory distress at Emergency Department.

Methods: This was a non-randomized study of feasibility of nasal bCPAP in managing children with respiratory distress at the emergency department. All under-fives with respiratory distress were included in the study after consent. Structured data collection tool was used to obtain clinical information, indications and duration of nasal bCPAP use. Pediatrics Early Warning Score (PEWS) was calculated. Nasal bCPAP was applied based on the decision of the treating physician and availability of the machine. For those who didn’t receive nasal bCPAP, reasons were determined. SPSS was used for analysis and descriptive statistics were reported.

The Masquerade of Abdominal Pain

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Background and Objectives: The diagnosis of acute abdomen in pediatric population is a known challenge. Inability to get accurate history, coupled with anatomical and physiological differences posed a great barrier to the clinician. We present observation plays an important role in the approach of acute abdominal pain in pediatric population. Any deviation of symptoms and alarming vitals from the initial treatment provided should raise a suspicion of potential life threatening causes.

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A Review of MRIs Performed For Musculoskeletal Presentations in a Rural University Teaching Hospital Emergency Department
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Background and Objectives: Musculoskeletal presentations can account for up to 30% of attendances to Emergency Departments and frequently are discharged following a normal x-ray. However, some presentations may require more advanced imaging to clarify the diagnosis. This study aimed to analyse the MRI referral patterns from a public emergency department (ED) and to analyse the outcome of early access MRI from MSK presentations.

Methods: MRIs that were referred from ED were reviewed retrospectively for a 1 year period from October 2017 to October 2018. Exclusion criteria included MRI of the scaphoid and the lumbosacral spine. Patient records were interrogated to ascertain the follow up and further management of the injuries if any. Results: There were 79 MRIs performed during the study period. All of the patients included had a normal plain radiograph performed on initial presentation. 77.2% were male with a median age of 30.0 (IQR 19.0, 47.0, Range 13-73). The scans included MRIs of knee (n=49, 62%), shoulder (n=14, 17.7%), ankle (n=9, 11.4%), elbow (n=2, 2.5%), foot (n=2, 2.5%), femur (n=1, 1.3%) wrist (n=1, 1.3%) and thumb (n=1, 1.3%). The median time to MRI from ED was 144.0 hours (24.0:336.0, 1-672) 89.9% (n=71) of the scans performed were positive. Post MRI 83.5% of the patients were referred to the fracture clinic with the remainder (n=13, 16.5%) referred to physiotherapy. Of the patients with a positive scan, 30.9% (n=22) subsequently had surgery performed for pathology including ACL ruptures (n=14), rotator cuff tears (n=6), Rotbergs disease (n=1) and a high ankle sprain (n=1). Conclusions: MRI is often used in detecting common injuries, but in some cases may lead to surgery. Corresponding Author: James Foley (buffersjames@hotmail.com)

A Case Series of Late Presentation Myocardial Infarction Complicated with Ventricular Septal Defect
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Background and Objectives: Ventricular septal rupture (VSR) is a rare but lethal complication of acute myocardial infarction (AMI). Incidents of VSR following AMI ranges between 0.17 to 0.31 based on few registries and case series. Early recognition and prompt diagnosis is paramount as it will change the course of management for the patient. This paper presents 2 such cases. Methods: Two cases of AMI with VSR diagnosed via bedside echo in emergency department. Results: Patient 1, a 64-year-old with epigastric pain for 2 days, and one week prior. His murmur at left sternal edge and aortic area. ECG showed ST elevation II, III, A VF and lead V3-V6. Bedside echo showed ventricular septal rupture near the apex. He was referred to cardiac center, operated and survived. Patient 2, a 65-year-old...
Chilaiditi’s Sign Mimicking Pneumoperitoneum: a Case Report
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Background and Objectives: Chilaiditi’s sign is a rare and incidental radiographic feature of the large bowel positioned between the right diaphragm and the liver. Therefore Chilaiditi’s sign is often misdiagnosed as pneumoperitoneum or free air under the diaphragm. Patients with signs of pneumoperitoneum need further investigations or surgical procedures. In some cases Chilaiditi’s sign lead to unnecessary investigations or surgical procedures. Methods: Chilaiditi’s sign lead to unnecessary investigations or surgical procedures. A 83-year-old korean woman treated at a nursing home was present to the emergency department with abdominal pain. She was diagnosed with parkinson’s disease and rectal cancer stage I 3 months ago and underwent operation. She treated Endoscopic retrograde cholangiopancreatoscopy (ERCP), removed sludge with balloon and basket. The following imaging examinations revealed improved feature of abdomen, posterioranterior chest radiograph and the symptoms. Conclusions: Clinical physicians should be aware of Chilaiditi sign; the rare but possible complication of cholangitis. Chilaiditi sign mistakenly diagnosed as pneumoperitoneum could result in wrong treatments that may affect the patient’s prognosis.

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Limited Scrotal Ultrasound Protocol in Patients with Acute Scrotal Pain; Agreement Between Novice Emergency Resident and Radiologist

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Background and Objectives: The acute scrotal pain is a challenging condition for emergency physicians because of its various pathology and nonspecific symptoms. Ultrasound is rapid and accurate tool for differential diagnosis of acute scrotum. The objective of our study is to determine the diagnostic accuracy of novice emergency medicine residents performed point of care (POC) scrotal US for detecting scrotal pathology in emergency department by using pre designed limited protocol. Methods: This is a prospective observational study of all male patients, complaining of any acute scrotal pain. Three novice emergency medicine residents completed 1-day training course of POC scrotal US for acute scrotum. After training course, they performed POC US in the emergency department on patients complaining of acute scrotum according to pre designed protocol. Protocol was consisted of 5 findings which was positive or negative. All enrolled patients also underwent conventional US performed by radiologist. The sensitivity, specificity for detecting abnormality was evaluated and the agreement between novice emergency residents and radiologist was also evaluated by item to item. Results: Total 41 patients was included. The overall sensitivity and specificity of novice emergency residents performed point of care US examinations for diagnosing scrotal pathology were 56.25% (95% CI, 37.66%-73.64%) and 66.67% (95% CI, 29.93%-92.51%), respectively. Cohen’s kappa value of epididymal swelling is 0.49 (95% CI, 0.21-0.76), testicular swelling 0.38 (95% CI, 0.02-0.74), 1 case of decreased testicular blood flow of radiologist result was not detected by POC scrotal US by emergency residents. Intratesticular heterogenous echogenicity 0.55 (95% CI, 0.12-0.96), fluid collection in scrotum 0.61 (95% CI, 0.35-0.87), echogenicity 0.55 (95% CI, 0.12-0.96), fluid collection in scrotum 0.61 (95% CI, 0.35-0.87). Conclusion: Our study suggests that novice emergency resident-performed POC scrotal US was moderately sensitive and specific for diagnosing scrotal pathology with limited US protocol. Fluid collection in scrotum and intratesticular heterogenous echogenicity showed moderate to substantial agreement between novice residents and radiologist.

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Analysis of Delay Factors of Delayed Arrival in Emergency Department After Symptoms of Patients with Septic Shock

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Background and Objectives: Sepsis is the most common cause of non-cardiovascular death, and the severity of death is reported to be 23% to 46% depending on the timing of the intervention. The emphasis is placed on the importance of prompt treatment, including early recognition and antibiotic treatment. Despite the importance of getting to the hospital soon for treatment, there is a lack of research on this. The purpose of this study is to investigate the factors associated with delayed time until the patient arrives at the hospital after symptom onset of septic shock. Methods: It is a retrospective secondary data analysis study based on electronic medical records of hospitals. The subjects of this study were 180 patients diagnosed with septic shock in the emergency room of one general hospital in Seoul. Demographic characteristics, disease-related characteristics, and environmental characteristics such as visiting methods were analyzed. Results: The time to visit after symptom onset of septic shock was gender (χ² = 6.771, p = 0.009), age, consciousness level (χ² = 5.506, p = 0.019) Respectively. In addition, there was a significant difference in the time spent on the visit when visiting 119 (χ² = 15.679, p = 0.003) Conclusions: There is a difference in the visit time according to the symptom of the septic shock patients and the means of visit. Based on this, it is necessary to reflect these findings in educating the septic shock patients at high risk.

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The Effect of Simulation Training For the Implementation of Nurse Co-led Cardio-pulmonary Resuscitation in the ED

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Background and Objectives: Using a senior nurse as a co-team leader has been proposed as more efficient in the setting of the cardiac arrest team in the ED. Our study examines the effect of a simulation training program based on Korean Triage and Acuity Scale for nurses in the emergency medical center who completed KTAS training and then examined its effectiveness for the setting of the evaluation of clinical decision-making skill, job satisfaction, and customer-orientation. Methods: The study participants were 30 nurses in the emergency medical center of a general hospital. The educational nursing simulation program was developed with the ADDIE model which consists of five steps: analysis, design, development, implementation, and evaluation. Once content validity had been reviewed by a group of experts, standardized patients were trained with the developed scenarios and a pilot test was conducted. Afterwards, five scenarios in total were run and debriefing sessions were organized for the participants after running the scenarios. Results: SPSS 22.0 was used for data analysis. 1. The mean scores of clinical decision-making skill before and after the simulation were 2.66±0.25 and 3.95±0.36, respectively, and this difference was statistically significant (t = -6.98, p < 0.000). 2. The mean scores of job satisfaction before and after the simulation were 2.65±0.56 and 3.86±0.47, respectively, and this difference was statistically significant (t = -6.98, p < 0.000). 3. The mean scores of customer-orientation before and after the simulation were 2.67±0.34 and 3.88±0.69, respectively, and this difference was statistically significant (t = -6.98, p < 0.000). Conclusions: Given the results of this study, the simulation-based education is expected to be applied to KTAS education, and the results also showed that simulation-based education is a useful educational method for triage nurses in emergency medical centers. Furthermore, this study has a great significance since it is the first simulation research related to triage. Further follow-up research is suggested on the development and application of diverse simulation-based nursing educational programs related to emergency medical care and triage in the future.

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Study of Triage Effectiveness in the Emergency Department Before

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Nurses’ Perception of Their Triage Competency After a Triage Course
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3Acute and Emergency Care Centre, KTPH A&E attends to a daily average of 320 patients. Appropriate triage contributes significantly to timely and optimal management of patients. An enhanced triage course taking into account our patient population, our nurses’ experience and competency was developed for our nurses. This course was conducted over 9 months (from August 2015) and was attended by approximately 150 staff. To assess Emergency Department (ED) Triage nurses’ perception and satisfaction with the course (thoroughness, accuracy, consistency), To understand ED Triage nurses’ perception on the benefit of the course and triaging process. Methods: A survey was completed by 89 respondents who had attended the course. The survey content and development are as follows: - Questions were developed by core trainers from KTPH A&E and National Healthcare Group, Health Services Operations Research. – The questionnaire consist 3 sections: 1. Demographic data. 2. ED Staff’s Perception and Satisfaction Survey. – Questions on perception focused on knowledge, skills and ability to conduct triage accurately and consistently; response options included: Strongly Disagree, Disagree, Agree, and Strongly Agree. – Satisfaction was based on a scale of 0 (extremely dissatisfied) to 10 (extremely satisfied). 3. Open-ended section - to elicit how the course has benefited the trainees and patients Results: In general, majority of the respondents had positive perceptions (75.3%-98.9% rated “agree” or “agree strongly”). Items with the highest percentage of “agree” and “strongly agree” tend to relate to respondents’ perception of the course, and to improved awareness of danger signs. More than half of the respondents stated that the course improved their knowledge and skills in triaging, and that the course will help patients receive timely care. Conclusions: It has been useful for us to do this survey. We have expanded on our contents and modified our teaching methods.
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Background and Objectives: Triage is the first point of clinical contact for all patients presenting to the Emergency Department (ED). EDs are faced with intricate challenges due to the increasing number of unscheduled patients’ visit and lack of high quality healthcare services like mis triage by untrained nurses. Over triaging patients may lead to unnecessary use of resources while under triaging patients may have catastrophic results for patients. The purpose of this proposal was to find out if training nurses in triaging techniques affects the number of cases which are over or under triaged. Methods: This was a prospective experimental study in the ED of max super specialty hospital in New Delhi. Patients above the age of 18 years who were triaged were included in the data collection whereas patients below the age of 18 years or brought dead on arrival were excluded. Data from 27 nurses who triaged patients were collected and segregated into patients being overtriaged, undertriaged or correctly triaged. These same nurses were then regularly trained in the “Emergency Severity Index Algorithm” for a period of one month. Post training the patients triaged by them were again segregated into overtriage, undertriage and correct triage. Results: Before training, the percentage of patients over triaged were 46.5% [CI-38.58–54.66], under triaged were 34.72% [CI 27.43–42.80] and patients correctly triaged were 18.73% [CI-13.22–25.91]. After training nurses who were over triaged were 14.29% [CI-8.37–23.33], under triaged were 2.38% [CI-0.66–8.27] and correctly triaged were 83.33% [CI-73.95–89.80]. Conclusions: Our study shows that training nurses in triaging techniques can lead to an increase in the number of patients correctly triaged and hence limit wastage of resources and provide appropriate care for over triaged or under triaged patients.
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Role Expansion of Emergency Nurse–Geriatric Screening and Assessment in Emergency Department
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3Acute and Emergency Care Centre, KTPH A&E attends to a daily average of 320 patients. Appropriate triage contributes significantly to timely and optimal management of patients. An enhanced triage course taking into account our patient population, our nurses’ experience and competency was developed for our nurses. This course was conducted over 9 months (from August 2015) and was attended by approximately 150 staff. To assess Emergency Department (ED) Triage nurses’ perception and satisfaction with the course (thoroughness, accuracy, consistency), To understand ED Triage nurses’ perception on the benefit of the course and triaging process. Methods: A survey was completed by 89 respondents who had attended the course. The survey content and development are as follows: - Questions were developed by core trainers from KTPH A&E and National Healthcare Group, Health Services Operations Research. – The questionnaire consist 3 sections: 1. Demographic data. 2. ED Staff’s Perception and Satisfaction Survey. – Questions on perception focused on knowledge, skills and ability to conduct triage accurately and consistently; response options included: Strongly Disagree, Disagree, Agree, and Strongly Agree. – Satisfaction was based on a scale of 0 (extremely dissatisfied) to 10 (extremely satisfied). 3. Open-ended section - to elicit how the course has benefited the trainees and patients Results: In general, majority of the respondents had positive perceptions (75.3%-98.9% rated “agree” or “agree strongly”). Items with the highest percentage of “agree” and “strongly agree” tend to relate to respondents’ perception of the course, and to improved awareness of danger signs. More than half of the respondents stated that the course improved their knowledge and skills in triaging, and that the course will help patients receive timely care. Conclusions: It has been useful for us to do this survey. We have expanded on our contents and modified our teaching methods.
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Background and Objectives: With the ageing demographic means that increasing numbers of older people will be attending emergency departments. The A&E department sees an influx average of 1,000 elderly patients a month with complex medical conditions and needs. Emergency providers need to move beyond the concept of “admit vs. discharge” for our elderly patients and think in terms of a continuum of care model. The team collaborate with Geriatricians and Geriatric Specialty nurses to have the role expansion of emergency nurses. Ensure safe discharge for elderly patient with necessary referrals and follow ups. Early detection of geriatric syndromes. Opportunistic screening for early pick up of Geriatric issues at ED and linking up to GRM specialist treatment for timely intervention.
Methods: Design and standardized multidisciplinary Geriatric assessment tools used throughout inpatient and SOC. A pool of emergency nurses identified for Geriatric training and to perform Geriatric screening and assessment for patients 78 years and above. Results: A&E Geriatric Nurses have screened total of 980 Geriatric patients since April 2017 till July 2017. 626 Geriatric patients were asessed fit for discharge and are referred to appropriate care follow up based on their clinical frailty score. Geriatric issues such as Acute Delirium, Poor vision, unsteady gait with non-walking aids, Home safety, early dementia, incontinence with nocturnal, Care giver stress, social issues are deemed unsafe for discharge. Conclusions: The project has proven with its results findings on the effectiveness of intervention strategies targeting to this group population and maximising the optimal care of older Adults in the emergency department. Patients have benefitted with the early interventions and have better patient outcome.
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Nurses’ Perception of Their Triage Competency After a Triage Course and Their Level of Satisfaction of the Same Course
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Our Action For Suicide Prevention in Sapporo
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2Background and Objectives: Our hospital accepts approximately 8,000 patients a year by ambulance. In Sapporo, most of drug overdose patients (OD as follows)
are conveyed to our hospital and the other emergency hospitals without a psychiatrists are also accepting a lot of suicide attempt patients. Suicide attempt case management for the prevention of further attempts is an urgent issue in Sapporo.

**Methods:** We elucidated an effect of our activity. We formed the psychiatry emergency liaison team by the staffs of various types of job, such as emergency physicians, ER/FUC nurses, psychiatrists, clinical psychologists, pharmacist, physical therapists, social workers. We introduced the OD critical path from April 2016. We frequently held many joint case conferences with the neighborhood psychia-

**Background and Objectives:** Emergency departments are often overwhelmed by increasing numbers of patients, despite implementation of process efficiencies. ED clinicians recognise that they are unable to meet all patient needs with increasingly limited resources, but inpatient clinicians often fail to recognise that their actions, or lack of actions, are a driving force in ED problems. We planned to develop a sophisticated metric which could clearly and visually demonstrate the causes of ED delay. **Methods:** We utilised Cerner First Net data to delineate critical times in the patient journey from January to October 2018. T1 was the time a patient was put into a bed in the Acute Area of our ED, T2 when a "Treatment Complete" stamp was placed on the patient record, and T3 when patient left the bed for another destination, whether discharged home, admitted to the ED Short Stay Unit, or admitted to an inpatient ward. T1-T2 defined the time a patient was therefore appropriately in an acute area bed, and T2-T3 defined the time they were inappropriately there. We then developed a heat map of all potential ED bed hours clearly showing these blocks of time, then used Gapminder software to animate and visually demonstrate the specialties responsible for delay. **Results:** A median of 32% of ED Lost Bed Capacity (LBC) was lost on a daily basis to bed block, ranging from 5% to 67%. Modelling of median trends showed that LBC due to ED discharged/SSU admitted patients improved from -20% to -12%, whilst mental health LBC peaked at -70% in mid-winter then improved to -50%. LBC due to medical specialities including cardiology, neurology, geriatrics and acute medicine continued to increase losing any seasonal trend. **Conclusions:** This novel graphical metric accurately assigns LBC to clinical teams, and gives a coherent basis to build a precise, non-linear whole-of-hospital model. **Corresponding Author:** Dai Taguchi (daiixxx@me.com)

**Modelling Emergency Department Flow; an Innovative Animated Graphical Metric of Bed Block**

**PO_ADM_01_02**

**Paul Middleton,1 Shiquan Ren1**

1South Western Emergency Research Institute, Liverpool Hospital/University of New South Wales, Australia

**Background and Objectives:** Emergency departments are often overwhelmed by increasing numbers of patients, despite implementation of process efficiencies. ED clinicians recognise that they are unable to meet all patient needs with increasingly limited resources, but inpatient clinicians often fail to recognise that their actions, or lack of actions, are a driving force in ED problems. We planned to develop a sophisticated metric which could clearly and visually demonstrate the causes of ED delay. **Methods:** We utilised Cerner First Net data to delineate critical times in the patient journey from January to October 2018. T1 was the time a patient was put into a bed in the Acute Area of our ED, T2 when a "Treatment Complete" stamp was placed on the patient record, and T3 when patient left the bed for another destination, whether discharged home, admitted to the ED Short Stay Unit, or admitted to an inpatient ward. T1-T2 defined the time a patient was therefore appropriately in an acute area bed, and T2-T3 defined the time they were inappropriately there. We then developed a heat map of all potential ED bed hours clearly showing these blocks of time, then used Gapminder software to animate and visually demonstrate the specialties responsible for delay. **Results:** A median of 32% of ED Lost Bed Capacity (LBC) was lost on a daily basis to bed block, ranging from 5% to 67%. Modelling of median trends showed that LBC due to ED discharged/SSU admitted patients improved from -20% to -12%, whilst mental health LBC peaked at -70% in mid-winter then improved to -50%. LBC due to medical specialities including cardiology, neurology, geriatrics and acute medicine continued to increase losing any seasonal trend. **Conclusions:** This novel graphical metric accurately assigns LBC to clinical teams, and gives a coherent basis to build a precise, non-linear whole-of-hospital model. **Corresponding Author:** Paul Middleton (Paul.Middleton@health.nsw.gov.au)

**Repurposing Efficiency of Inter-Facility Emergency Department Transferred ST Elevation Myocardial Infarction Patients**

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1Emergency Department, Nantou Hospital, Taiwan; 2Department of Internal Medicine, Chung Shan Medical University Hospital, Taiwan; 3Department of Internal Medicine, Nantou Hospital, Taiwan; 4Department of Emergency Medicine, Nantou Hospital, Taiwan; 5Department of Nursing, Nantou Hospital, Taiwan

**Background and Objectives:** Percutaneous coronary intervention (PCI) was the main strategy for ST-elevation myocardial infarction (STEMI) in Taiwan. This study aims to assess the time efficiency on active intervention measure that physicians in local emergency department (LED) connect to the CATH lab of a tertiary hospital. **Methods:** This is a retrospective and hospital based analysis from 2014 to 2017. Conventionally, LED has to connect to TUH-ED and get an approval before patient being referred. To push for better PCI time efficiency, LED striving for the permission to actively connect the CATH lab of TUH rather than informing their ED first. Both first EKG time done in LED and TUH, the LED delay time, ambulance travelling time from LED to TUH and the TUH-ED delay time for Cath lab balloon open were calculated. **Results:** 226 STEMI patients were received PCI procedures in TUH, in which 153 were either walk-in patients or being sent directly via prehospital emergency medical system to TUH-ED, and 73 were referred from the LED hospital. The first EKG was done in 13.03 ± 53.48 minutes in LED, and 6.04 ± 11.45 in TUH; and the average LED delay time and ambulance travelling time was 54.6±34.64 (median=43 minute), and 20.7±3.48, respectively in LED. The time window from the first ED contact to Cath Lab was 119.4±50.84 for LED patients and 77.99 ±46.31 for TUH-ED direct visiting patients. However, the TUH-ED delay time was shorter for patients referred from the LED (40.57±17.74 vs. 74.19±44.16). **Conclusions:** With actively TUH-ED bypass Cath Lab connection, LED productively minimized the delay time window for STEMI patients to receive PCI. **Corresponding Author:** Shih-Chang Hung (shihchan@gmail.com)

**Which Crowding Measures Are Most Strongly Associated with Quality of Care?: a Systematic Review**

**Peter Jones1**

1Emergency Medicine, University of Auckland, Auckland City Hospital, New Zealand

**Background and Objectives:** Emergency Department (ED) crowding intuitively impedes quality of care. There are many proposed crowding metrics, but the metric most strongly associated with care quality is unknown. This study aims to determine the crowding metric with the strongest links with processes and outcomes of care linked to the institute of medicine quality domains. **Methods:** Systematic searches in healthcare databases were conducted using terms for ‘crowding’, ‘metrics’ and ‘performance’, supplemented by grey literature and citation searches. The level of evidence for each association was assessed using an explicit tool and the body of evidence was assessed using the GRADE approach. Evidence was synthesised using harvest plots. **Results:** Titles and abstracts of 2,052 studies were screened, 568 selected for full text review and 198 included. Inter-observer agreement on selection was very good k=0.79 (0.76 to 0.82). Two thirds were from Level 4 hospitals in North America (60%), Australasia (20%), Europe (10%) and Asia (7%). One third provided Level 3 or higher evidence. Metrics were based on Occupancy (36%), Time (35%), Workload (18%) or Combinations of these (8%). Data were synthesised from 42,248,927 patients, 1,208 staff, 9,128 hospitals and 102,977 sampling times. Almost all crowding metrics were patient centred and reflect timeliness and efficiency. Boarding Time, ED Length of Stay, and total Occupancy had the strongest association with safety and effectiveness of care. Of these only ED LOS was associated with equity. **Conclusions:** Boarding Time, total ED LOS and Occupancy are the crowding metrics with the strongest evidence of associations with the domains of healthcare quality. **Corresponding Author:** Peter Jones (peterj@adhb.govt.nz)

**The Emergency Medicine Early Warning System–a Tool to Assist in the Detection Patient Deterioration**

**Fiona McDaid1, Felgir Hickey2**

1National Emergency Medicine Programme, Nurse Lead, Ireland; 2Emergency Department, Sligo University Hospital, Consultant in Emergency Medicine, Ireland

**Background and Objectives:** Globally, increasing attendances at Emergency Departments and exit block has caused worsening delays for patients to be seen by clinicians. These delays cause an additional risk for patients; the risk of deterioration following triage but before being seen by the clinician. In an attempt to lessen this risk, Ireland has developed the Emergency Medicine Early Warning System (EMEWS) to improve the safety of patients where the number of patients waiting to be seen exceeds the ED’s capacity to see them within standard timeframes. EMEWS was developed by the National Emergency Medicine Programme (EMP) in conjunction with the Irish Department of Health. It was launched as a National Clinical Guideline in October 2018 by the Minister of Health and mandates that EMEWS is used in all EDs to aid recognition of and response to the deteriorating patient. **Methods:** How does it work? Following Triage using the Manchester Triage System (MTS), all adult patients (> 16 years) are considered for inclusion on EMEWS. The triage category indicates the level of nursing review they should receive from the time of triage until they leave the ED to be discharged home or the decision to admit. **Results:** Conclusions: As their care needs
PO_ADM_01_06

Demographic Analysis of Emergency Room at an Urban Community Hospital, Osaka, Japan

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Background and Objectives: The need and supply of emergency medicine differ depending on the healthcare insurance system and regional culture. For promotion of training emergency physician, it is important to survey presenting disease admitted to the emergency room (ER). The aim of this study was to provide an epidemiological survey of distribution of clinical features at our hospital. Methods: The study was performed from April 1, 2016 to March 31, 2017, at Osaka Saiseikai Noe Hospital (Osaka, Japan). All the included cases are classified as a first level into four categories as medical disease, trauma and orthopedic disease, environmental and toxic disease and other. Furthermore, we hierarchically classified as a second level, according to the departments or organs, and as a third level according to diagnosed diseases or complaints. Results: A total of 10,095 patients who visited to our ER were enrolled. The mean age was 57.3 years. 5,448 patients (54.0%) were transported by ambulance. The others visited ER walk in. In ambulance cases, 3,667 cases were medical disease, 1,255 cases were trauma and orthopedic disease, 131 cases were environmental and toxic disease, and 384 cases were the other category. In category of medical disease, the most common department in the category of medical disease were Cardiology (24%), Gastroenterology (22%), Respiratory medicine (17%), Neurology (13%). And the most common subcategory in the category of trauma and orthopedic disease were Head and Face injury without fracture (31%), Limb injury (19%), Limb fracture (8%), backache (7%). Conclusions: This study provides a better understanding of the diseases and departments for the ED visit and the training system of ER physicians. The results can be used in order to improve facilities appropriate for the specific population in the ER.

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PO_ADM_01_07

Characterizing Privately Owned Freestanding Emergency Departments in the United States

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Background and Objectives: Freestanding emergency departments (FEDs) are structurally separate from hospitals. These facilities are increasing in number globally. They can be privately owned or owned by a hospital system. The largest EDs are globally. They can be privately owned or owned by a hospital system. The largest EDs are Freestanding and Hospital-based Emergency Departments. Patients who are the most acutely ill and most likely to experience physiological deterioration. Medicaid 0.83%, Medicare 0.66%. Privately owned FEDs compared to EDBA 10.3%.

Results: In total, 97,473 ED visits to 18 private FEDs representing 14 companies in Texas were included. Facilities are fully physician-owned 61.11%, partially physician-owned 33.33% and publicly traded 5.55%. They are located in suburban 50%, urban 39% and rural 11% areas. Physicians are 95.18% board certified. Emergency severity index level for emergency medicine, Uniformed Services University, United States of America; 1Emergency Medicine, Cleveland Clinic Akron General, United States of America; 2Emergency Medicine, Cleveland Clinic, United States of America

Background and Objectives: Freestanding emergency departments (FEDs) are emergency departments that are structurally separate from a hospital. As FEDs grow in number in the U.S.A. and other countries, research is needed to understand if FEDs provide access for underserved populations. Our objective was to determine demographics of Medicaid patients seen at 5 FEDs vs. 16 HBEDs within a large healthcare system. Methods: Medicaid patient database was created from 1,272,170 ED system wide visits between 1/10/2017–30/9/2018 and totaled 417,817. Frequency distribution was stratified by FEDs vs. HBEDs for age, race, gender, acuity, method of emergency department arrival and patient disposition.

Results: For all Medicaid patients seen, FEDs represented 13.67% (57,121) and HBEDs 86.33% (360,696). Of all patients seen at FEDs, 26.6% are Medicaid and 34.8% are Medicaid at the HBEDs. Mean age at FEDs was 30 (SD±16.5) and 30.7 (SD±18.4) at HBEDs. Gender was 63% female at FEDs and 59.13% at HBEDs. Patient race was black 23.38% vs. 57.93%; white 68.5% vs. 33.9%; Asian 1.3% vs. 0.7%; other 6.8% vs. 7.5% at the FEDs vs. HBEDs respectively. Patients arrived via ambulance 6.6% at FEDs and 16.8% at HBEDs. Emergency severity index (ESI) level 1 was 0.12% vs. 0.33%; ESI level 2 was 3.42% vs. 9.56%; ESI level 3 was 53.02% vs. 53.80; ESI level 4 was 41.37% vs. 32.86%; ESI level 5 was 2.06% vs. 3.45% at the FEDs and HBEDs respectively. Patient disposition was admitted 7.59% vs. 15.87% and discharged 90.91% and 81.84% at the FEDs vs. HBEDs respectively. Patients who left without being seen were 0.02% at FEDs and 0.14% at HBEDs. All comparisons between FEDs and HBEDs were significant (p<0.001).

Conclusions: Medicaid patients demographics differed significantly between the FED and HBED populations. FEDs see 26.6% Medicaid patients and HBEDs see 34.8% Medicaid within our large healthcare system.

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PO_ADM_01_08

Redirection of Emergency Patients to Primary Health Care Facilities Leads to High Rate of Emergency Departments Return Visits and Hospital Admissions

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Background and Objectives: Emergency departments crowding is a major challenge to the practice of emergency medicine. It is a patient safety concern and a public health issue globally. The adverse consequences of ED crowding are evident to either the individual patients or the health system. One suggested solution is demand reduction strategy, such as redirection of patients. This study aims to assess the outcomes of CTAS triage category three and above patients who are redirected to primary health care facility. Methods: This was a descriptive retrospective study of patients labelled as left without being seen, redirected ED patients, selected from January 2016 to December 2016 in Royal Hospital-Oman. This study was approved by the Research and Ethics committee. The triage at this tertiary care ED adapts Canadian Triage and Acuity Scale (CTAS). Information regarding ED visit was abstracted from computerized ED information system “Al Shifa system” including demographic characteristics, time of presentation, presenting complaint and acuity level. A descriptive statistic was used for patient demographics and the emergency department return visits. Results: Throughout the study period 61,904 ED visits were registered. About 12,659 (20.4%) % of the total ED visits labelled as left without being seen. A representative sample of 660 patients was selected for the study out of the 6,755 patient who had triage assessment. A 130 (19.7%) patients returned to the ED with the same complaints, of admitted patients. Median door to doctor time was 12.56 minutes vs. 25 minutes. Left without being seen rates were 1.18% vs. 2.7%. All private FEDs could take ambulance traffic, but 5.56% actually received traffic. Conclusions: Privately owned FEDs are primarily fully physician owned, located in suburban areas, and have lower volumes and faster operational metrics when compared to HBEDs. Corresponding Author: Erin Simon (esimon78@yahoo.com)
which 42 patients (6.6%) had an admission within 48 hours of their initial visit to the ED triage and another 88 (13.8%) patients revisited the ED within the same week. One patient (0.2%) died within one month of the initial visit to adult ED.

**Conclusions:** Redirection of emergency patients CTAS category three and above to other primary health care facilities is associated with significant rate of Emergency Departments return visits and hospital admissions.

**Corresponding Author:** Mahmood Aljufaili (docma08@gmail.com)

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**Mortality of Patients with Acute Respiratory Distress Syndrome (ARDS) in Vietnam According to the Severity of the Berlin Definition**

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1Department of Hygiene and Public Health, Teikyo University School of Medicine, Japan; 2Emergency Department, Bach Mai Hospital, Vietnam; 3Department of Internal Medicine, National Defence Medical College, Japan; 4Intensive Care Unit, Bach Mai Hospital, Vietnam; 5Division of Pulmonary Medicine, National Center for Global Health and Medicine, Japan; 6Division of Respiratory Medicine and Allergology, Department of Medicine, Teikyo University School of Medicine, Japan; 7Organization for Regional and Inter-regional Studies, Waseda University, Japan

**Background and Objectives:** The burden of mortality of ARDS according to the Berlin definition has not ever been reported from Vietnam. **Methods:** We conducted a retrospective chart review on patients who admitted and were diagnosed ARDS in a national tertiary care hospital, Hanoi, Vietnam between 2015 and 2017. The data on ventilator settings and conditions on gas exchange were collected at the time of 1st day and the 3rd day of admission. The primary outcome was hospital mortality. The secondary outcomes included comparisons of respiratory conditions among three groups of ARDS severity on the Berlin definition.

**Results:** In 126 eligible patients, the median age was 53 (IQR, 39-63) years and 66% was male, 93% of direct risk for ARDS was pneumonia. Overall hospital mortality was 57.1%. In total patients, the period prevalence of severe ARDS on Day 1 was 53.0%; of moderate ARDS 37.3%; and of mild ARDS 9.5%. The ARDS severity changed on Day 3 due to improvement/deterioration of PaO2/FiO2 in each patient. Of the total patients on Day 3, severe ARDS was 27%; moderate ARDS, 35.7%; and mild ARDS, 12.7%. In addition, 6.3% of patients showed an improvement of over 300 of PaO2/FiO2. The hospital mortality did not differ significantly among three groups of ARDS severity on Day 1 (p=0.163), but when compared among three groups of ARDS severity on Day 3, it was significant (p=0.017). In the length of hospitalization using the Kaplan-Meier method, the survival time of severe ARDS was significantly shorter among three groups of ARDS severity on Day 3 (p=0.030). **Conclusions:** The present study demonstrated that the clinical outcome of ARDS patients in Vietnam depends on the improved ARDS severity within three days from the hospital admission. In Vietnam, the mortality of ARDS can be verified by the Berlin definition.

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**Endoscopic and Anatomopathological Aspect of Esophageal Cancer in the Endoscopic Unit of Point Hospital “G”: 30 Cases in Mali**

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1Internal Medicine, Protection Civile, Mali

**Background and Objectives:** The purpose of the study was to determine the frequency of esophageal cancer in the Endoscopic Unit of the Department of Internal Medicine at Point “G” National Hospital and to describe its endoscopic and pathological aspects. **Methods:** We performed a retrospective study of patient records seen endoscopically in this unit from January 1990 to December 2000, a period of 11 years. The inclusion criterion was the presence of esophageal tumor at upper gastrointestinal fibroscopy whose malignancy was confirmed by anatopomathological examination. During the study period, 47,440 fibroscopies were performed; 30 cases of histologically confirmed esophageal cancers were diagnosed. **Results:** The incidence estimated at 3 cases per year. The average age of the patients was 58±13 years with extremes of 14 and 80 years. The sex ratio was 2 in favor of men. Dysphagia was the reason for endoscopy in 70% of cases. Tumor localization at the bottom 1/3 was more frequent (60%). The budding form predominated (47%). The endobrachy esophagus was found in 13.33% of cases. Squamous cell carcinoma predominated (76.70%). Adenocarcinoma accounted for 23.30%. **Conclusions:** Esophageal cancer is not uncommon in Mali. It was discovered at a late stage, because most of the patients presented a sign of stenosis, dysphagia, weight loss and vomiting. This cancer is present on the endoscopic plane. A predominance of budding forms 60%. The histologically dominant type is epidermoid carcinoma 76.16%. However, the frequency of adenocarcinoma is not negligible 23%. The barrel esophagus is frequently encountered in our series because 23% of the cancers occurred on a mucous membrane of Barret.

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**Utility of Level-coded Chief Complaints in Improving the Triage Performance of Modified Early Warning Score in Emergency Department**

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**Background and Objectives:** Accurate triage is important in emergency department (ED), and modified early warning score (MEWS), which use vital signs and level of consciousness, has been reported to be useful for triage in ED. Chief complaints (CC) is also available at presentation, but has high cardinality. Thus, we aimed to improve triage accuracy.

**Methods:** We used first vs. vasopressin.

**Results:** Five retrospective cohort studies and one prospective randomized control trial were included in the meta-analysis. Compared with vasopressin, the risk of hypotension is higher when norepinephrine is discontinued first among patients in the recovery phase of septic shock on double vasopressors (RR 0.40 [0.25, 0.65]). There is no difference in mortality in the order of vasopressor weaning among patients in the recovery phase of septic shock (RR 0.98 [0.78, 1.02]). **Conclusions:** Based on the results, there is increased risk of hypotension when norepinephrine is discontinued first vs. vasopressin.

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Pulse Pressure Variation vs. Pulse Oximetry Plethysmography Variation in Swine Hemorrhagic Shock Model

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Background and Objectives: Predictive value of tachycardia in hemorrhagic shock is limited. We performed this study to investigate whether pulse pressure variation (PPV) and pulse oximetry plethysmography (PoPV) can predict volume loss better than heart rate (HR) in swine hemorrhagic shock model. Methods: In 4 pigs, 15, 30, and 40% of blood volume was drawn over 10 minutes and maintained for 15 minutes for each step. Then we transfused 10, 25, and 40% of stored blood. In 3 pigs, we reduced heart rate (HR) by 30% from baseline through esmolol infusion. We collected data with respect to mean arterial pressure (MAP), HR, PPV, and PoPV and compared their changes induced by blood loss. Results: PPV and PoPV were well-correlated in pigs with hemorrhagic shock (rho=0.717). However, in esmolol-treated pigs, PoPV over-estimated blood volume loss and the correlation became poor (rho=0.097). In each step of hemorrhagic shock, PPV, PoPV, and HR could well predict blood volume loss. When compared PPV and PoPV with HR, the change in PoPV was not significantly different from that in HR (p=0.107), but the change in PPV was significantly higher than that in HR (p=0.002), particularly in esmolol-treated pigs with hemorrhagic shock. Conclusions: The correlation between PPV and PoPV during hemorrhagic shock was affected by beta-blocking agents. The change in PPV was more significant than that in HR. PPV may be the most valuable tool to predict blood volume loss, particularly in patients with beta-blocking agents during the early period of hemorrhagic shock.

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To Thrombolyse or Not?: Kounis Syndrome Post Cefoperazone Administration in a Patient with Advance Colon Adenocarcinoma

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Background and Objectives: For the first reported case in 1950, various attempts has been made to define Kounis Syndrome as well as explaining the pathophysiology and treatment of this allergic myocardial infarction. In non PCI Center, Kounis Syndrome with ST Segment Elevation imposes diagnostic dilemma due to uncertainty whether there is involvement of pre existing coronary artery disease that requires antplatelet and thrombolytic therapy. Methods: Case Report. Results: We describe a case of 56-year-old gentleman with advanced descending colon adenocarcinoma who presented to our center for septic shock secondary to infected stoma site. Following administration of intravenous cefoperazone, he developed anaphylaxis and typical central chest pain. Repeated ECG showed ST Segment Elevation at lead V3-V6. After adrenaline injection, he deteriorated. Other treatment for anaphylaxis was initiated and he was given IV intravenous glyceryl trinitrate infusion. The symptoms resoloves after the treatment and repeated ECG shows returning of ST Segment elevation to the baseline. Conclusions: Kounis syndrome should be suspected following anaphylaxis that developed after administration of antibiotic. Adrenaline should be used with caution as it may worsen the cardiac ischaemia while other standard management of anaphylaxis should be initiated. Decision to start antplatelet and thrombolytic therapy should be made upon risk stratification and consideration of the risk and benefit of the treatment.
The Utility of Emergency Department's Bedside Ultrasound in Diagnosing Late Presenting STEMI in Elderly Patient with Undiagnosed 'Dextrocardia with Situs Inversus'  

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Background and Objectives: Combination of Undiagnosed Dextrocardia with Situs Inversus and ST Segment Elevation Myocardial Infarction (STEMI) is extremely rare and possess diagnostic dilemma. The introduction of bedside ultrasound in Emergency Department can overcome this difficulties and ensure managements to patient are properly addressed. Methods: Case reports. Results: We describe a case of 60-year-old lady who presented with acute gastroenteritis followed by right sided chest pain for three days duration. Electrocardiogram (ECG) done at Triage Zone showed slow atrial fibrillation with ST segment elevation and deep Q wave at lead V1. On examination, there was faint heard sound heard on auscultation and no apex beat felt at the left side of the chest. Therefore, bedside ultrasound was carried out and reveals dextrocardia with situs inversus. There were akinesia of anterior wall, hypokinesia of the antero-septal and apical ventricle of the heart, thrombus inside the left ventricle and mild enlargement of aortic root. Subsequently, right sided ECG was performed and showed extensive anteroseptal STEMI. Further work-up showed polycythemia, thrombocytosis, leukocytosis, acute on chronic kidney disease and metabolic acidosis. In view of poor access to PCI Center, she was treated conservatively with acute coronary artery disease drug regimes, haemodialysis and correction of dehydration. She was discharged at day 12 of admission and given follow-up appointment under Medical Outpatient Clinic. Conclusions: Excellent physical examination will alert the clinician regarding possibilities of undiagnosed dextrocardia. In this patient, the history and ECG are not reliable to diagnose STEMI. Bedside ultrasound assessment can overcome this problem, hence aiding the clinical decision making during patient assessment and management.  

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Background and Objectives: Excellence Reporting (ER), based on the concept of ‘learning from excellence’ (LFE), has been implemented in our Emergency Department (ED) to proactively recognise excellence, identify positive learning opportunities, and boost staff morale. An online system was created that enables staff to submit feedback about colleagues that have demonstrated excellent practice at work. The nominated staff members receive this positive feedback, which is then anonymously collated to provide learning outcomes for the department. Our objectives were to evaluate the impact of ER within our trust and to understand how LFE is being used to drive change and quality improvement more broadly through a systematic literature review. Methods: 65 staff members from the ED and Acute Assessment Unit completed a survey on the impact of ER and their experiences with the program. Both Likert-scale and open-ended questions were used, with coding applied to identify key themes. For the systematic review, the PubMed database was queried using keywords, generating 8 manuscripts, all of which were included. Results: We found that 66%, 64% and 66% of respondents agreed or strongly agreed with the statements “ER has created new opportunities to learn from good practice”, “ER has improved overall morale in my department” and “overall ER has been useful to my department” respectively. Positive key themes in the responses included: impact on department (improved morale and motivation) and impact on everyday practice (actively looking for excellence and increased interdisciplinary interaction). The literature review identified additional themes: staff support for the LFE concept and the suggestion that recognising excellence can support its incorporation into routine practice. Conclusions: Our study indicated ER has had a positive influence on staff morale and has identified positive learning opportunities; this is aligned with the literature, which reflects clear support for the philosophy underpinning LFE and its positive impact on staff morale.

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PO_EDU_02_02
A Human Factors Approach to Developing an Emergency Medicine Residency Dashboard
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Background and Objectives: With the advancement of medical education and the development of medical systems, training programs have had increased administrative and educational tasks for residents to complete. Ensuring that residents completed these tasks takes considerable organization by the residents and diverts significant administrative time and energy from residency leadership. In order to address these varied tasks, a human factors approach was used to develop a residency intranet website. Methods: Key stakeholders, including residents, attendings, and program coordinators were engaged to identify needs of the residency program. A thorough review of required residency tasks and associated paper and electronic tools was inventoried. Stakeholders were then interviewed to review these tasks and to identify additional stakeholder desires regarding the development of an intranet dashboard. Following the initial needs assessment, a residency dashboard was developed and then piloted to program leadership and cadre of volunteer residents. The website was then introduced into practice and continuous feedback has been actively sought from residents on a regular basis. Results: Following an extensive needs assessment, a dashboard was created that several resources to address the needs of residents. Key areas addressed included: 1) An orientation guide to residency with links to all orientation related tasks along with a resident sources “survival guide”. 2) Incorporation of evaluation forms to improve individual resident feedback while on shift. 3) Development of a “living” study guide with links to FOA Med resources that is updated by residents. 4) Development of a clinical operations guide to facilitate institution specific delivery of patient care.

Conclusions: The development of a resident dashboard has allowed our residents to refer to a single website that has facilitated their orientation process, their ability to obtain timely feedback, and a clinical reference that they can utilize when studying or delivering care in the emergency department. Website analytics will be utilized to track future resident use.

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PO_EDU_02_03
Cardiopulmonary Resuscitation Parameters Associated with Passing the Basic Life Support Evaluation in Health Care Providers
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Background and Objectives: High-quality cardiopulmonary resuscitation (CPR) is the cornerstone of life-saving system that influences favorable outcomes beyond return of spontaneous circulation (ROSC). American Heart Association (AHA) recommends the use of BLS adult CPR & AED skills testing checklist to aid BLS training and qualify participants during evaluation. The CPR parameters associated with passing the competency exam have never been reported. Objective: Aim to explore CPR parameters that associate with passing the BLS evaluation in health care providers. Methods: We prospectively collected data from May 2016 to June 2017 during BLS curriculum for health care providers in Lampang Hospital. Participants were evaluated by two blinded-evaluators. The participants were qualified as passed or failed based on the AHA 2015 checklist and recording strip printed by the manikins (Resusci Ann®). The CPR parameters were compared using t-test or exact probability test. Univariable and multivariable generalized estimating equation with logistic model was used to explore significantly associated parameters, reported with odds ratio. Results: Among 500 attempts from 351 participants, 317 passed (63.4%) and 183 failed (36.6%). The CPR parameters significantly associated with passing the evaluation were ventilation volume ≥ 500 mL (OR, 3.21; 95% CI, 1.17-8.78; p = 0.023), compression rate of 100 to 120/min (OR, 4.53; 95% CI, 1.59-12.97; p = 0.005), too shallow compression less than 30 presses per 5 cycles (OR, 58.26; 95% CI, 18.70-181.48; p < 0.001), and hand position wasn’t too low (OR, 8.33; 95% CI, 1.77-39.20; p = 0.007). Conclusions: Compression depth at least 5 cm, correct hand placement at lower half of sternum, and appropriate compression rate of 100 to 120/min significantly associated with passing the BLS evaluation in health care providers. Airway component was also essential but at less degree compared to others.

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Developing Physician Leadership through an Emergency Medicine Fellowship Program
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Background and Objectives: The Emergency Medicine Fellowship (EMF) in Qatar is a two-year, post-residency program to train fellows in management, leadership, education and academic skills alongside advanced clinical skills required for consultant level practice. Started in 2013, the innovative EMF curriculum has evolved to emphasize patient safety, teamwork, communication skills, quality improvement and clinical leadership. Methods: The EMF curriculum offered practical learning opportunities in a range of clinical leadership, teaching and management skills. For example, the EMF core faculty would observe the performance of EM fellows and facilitate multidisciplinary feedback from the nursing staff and colleagues on the fellow’s role in improving ED patient flow and an understanding of the ED patient journey. Working with the ED quality and the complaints management teams, the fellows were involved in answering real-life complaints and understanding the patient’s perspective through reflective learning. As well as lectures on the theory of quality improvement (QI) methodologies, EM fellows were required to lead an actual QI project. The fellows were trained in teaching skills and undertook peer-reviewed teaching sessions. The curriculum followed the ACGME educational milestones at level 5, aiming to achieve higher levels of competence in specified clinical skills e.g. Point-of-care Ultrasound (POCUS), advanced airway management, human factors training that. Results: Since 2013, 35 fellows have graduated from the EMF program helping to achieve consultant-delivered care with wider coverage of ED shifts, improvements to clinical supervision, patient safety and academic output. Several graduate fellows have taken up positions of leadership in clinical service, education, research and quality. The EMF curriculum has served as a model for a new subspecialty of advanced physician leadership at the ACGME-E. Conclusions: An EM program with a strong curricular emphasis on experiential learning has helped in leadership development for EM in Qatar and may serve as a model for other aspiring programs.

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The Impact of Clinical Supervision Shifts on the Resident Supervision
Elder Abuse in the Emergency Department: a Systematic Scoping Review

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Background and Objectives: Elder abuse in the ED is an understudied topic. It remains understudied and underreported with ED prevalence rates lower than those in community-dwelling older adults. Health care providers reported lacking appropriate training and knowledge with regards to elder abuse. ED-based studies are required.

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Small Group of Scenarios-based Video Aided in the Curriculum of ACLS Training

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Background and Objectives: ACLS (Advanced Cardiac Life Support) for Taiwan’s emergency and intensive care workers must pass the training and assessment of education every three years. For students, it is almost a 2-day study that compresses clinical situations. Whether it is really capable of responding well and giving proper treatment to patients in crisis situations is often a space to be strengthened.

Methods: This teaching improvement is directed at the teaching materials with records various related scenarios. In addition to highlighting the key points of each practice, it also records common mistakes made in the disposal of various situations. Allow students to preview at any time before class and review after class. The experimental group and the control group were recruited to do the questionnaire survey of the quality of the training course and the comparison of the scores of the two groups after using the supplementary teaching material.

Results: Student Satisfaction (0-5; Effective Questionnaire Response Rate: 100%) followed by satisfaction with overall training course (mean = 4.3), Video help with learning (mean = 4.3), overall teacher teaching satisfaction (mean = 4.3), and average self-study effectiveness after class (mean = 4.3). The performance of video-assisted teaching students, video-assisted situational teaching (average increased score of 5.02) comparing with no-user (average increased score of 2.57) were significantly improved.

Conclusions: To Taiwanese, teaching in general ACLS is a verbal explanation and demonstration by a teacher and their students practice operation. All learning is compressed within two days. Now video-assisted materials allow students to observe in advance and review after-hours. The video help with learning in ACLS teaching courses is significantly improved the teaching effectiveness. In today’s era of advanced technology, we can make good use of video aids to increase the effectiveness of teaching.

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Comparison Between Clinical Frailty Scale and Triage Risk Screening Tool in Predicting Outcomes of Emergency Department Elderly Patients

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Background and Objectives: To determine whether Clinical Frailty Scale (CFS) or Triage Risk Screening Tool (TRST) is the better tool for risk stratification of Emergency Department (ED) elderly. Methods: This was a retrospective, non-interventional study all patients age 65-and-above presenting to a busy in August 2018. Patients with both TRST and CFS scores performed were included. The CFS was collapsed into three categories: non-frail (CFS 1-4), mild-moderately frail (CFS 5-6), and severely frail (CFS 7-8), while TRST 2-and-above was taken as a positive screen. For admitted patients, hospital length of stay (LOS) and mortality will be assessed, whilst re-attendance or re-admission within 72 hours or 2 weeks will be assessed for discharged patients. Results: A total of 359 patients were included in the study, of which 191 (53.2%) were admitted and 168 (46.8%) were discharged. For admitted patients, the mortality rate of non-, moderately and severely frail patients was 2.7%, 7.0%, 16.7% respectively, compared to that of TRST negative 3.6% and positive 8.3%. The AUC of CFS vs. TRST in predicting mortality was 0.682 (p = 0.067), 0.468 (p = 0.067) vs. 0.642 (p = 0.153). The median length of stay (LOS) was 6 in both non-frail and TRST negative patients (p = 0.742). For frail patients (CFS 5-9), the median LOS was 8, compared with 9.5 in TRST positive (p = 0.014). For discharged patients, the 72h ED readmission rate for CFS was 1.4%, 5.6%, 12.5% compared to TRST’s 2.1%, 3.7% (p = 0.33). The 2-week readmission rate for CFS was 4.9%, 11.1%, 0% compared with TRST’s 5.7%, 3.7% (p = 0.72). Conclusions: CFS and TRST performed similarly as risk stratification tools. As the outcome numbers were small, a larger sample size is needed to be more conclusive.

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Initiating Palliative and End of Life Care in Emergency Department

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Background and Objectives: Recent studies in America and Australia show that early involvement of palliative care reduces Emergency Department (ED) presentations and admission rates by 50%. Early introduction of palliative care in ED rather than as an inpatient reduces length of stay by average of 4 days. A meta-analysis in 2014 showed early palliative care consultation reduced inpatient costs by 10% to 30%. Methods: I reviewed several case studies from our ED to establish the efficiency and effectiveness of the current provision of palliative and end of life care. I then analysed and studied international best practice guidelines to implement and create a local guideline in collaboration with other key stakeholders in our hospital. Results: With the aging population and improvement in management of acute illnesses, the EDs are experiencing more of chronic and end of life presentations such as oncology, cognitive impairment and various end stage organ diseases. However, the authors feel that recognising and initiating palliative care on eligible patients are currently suboptimal in current practice. Conclusions: EDs have a role to play in initiating palliative and end of life care. Several international best practice guidelines agree that early initiation of palliative and end of life care in ED is beneficial for patients and for health care system as a whole. To ensure provision of high quality palliative care, it is worthwhile to make efforts locally with key elements. Incorporating a teaching module on palliative and end of life care in training and encouraging research as a subspecialty. Establishing resuscitation status prior to leaving ED with regular clinical governance review to ensure standard via check lists and documentations. Developing an institutional protocol to empower different individuals in a multidisciplinary team approach. These key elements require comprehensive discussions with each stakeholder and assessment of feasibility in the Irish healthcare system.

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Prevalence of Frailty Amongst Elderly Patients Presenting to an Emergency Department in Singapore

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Background and Objectives: Frailty is a common clinical syndrome in older adults that carries an increased risk for poor health outcomes including falls, incident disability, hospitalization, and mortality. Accurate and early recognition, triage and subsequent management of frail elderly patients in the Emergency Department (ED) may help reduce future re-attendance, complications, and improve quality of life. Our ED started routine frailty scoring for all patients aged 65-and-above using the Clinical Frail Scale (CFS). This has allowed us to evaluate the prevalence of frailty amongst our elderly patients for the first time. Methods: This was a retrospective study involving elderly patients presenting to our ED between August to September 2018. The CFS will be collapsed into three categories: non-frail (CFS 1-4), mild-moderately frail (CFS 5-6), and severely frail (CFS 7-8). Results: A total of 4,139 patients were included in the study, 2,709 (65.5%) patients were non-frail, with 833 (20.1%) mild-moderately frail and 589 (14.2%) severely frail. Across all frailty groups, females were consistently more frail as compared to men. Predictably, prevalence of frailty increased with rising age. Amongst patients who were admitted (n = 2,742), 44.4% were frail: 25.4% mild-moderately, and 19.0% severely. Amongst the discharged (n = 1,798), majority were non-frail: 1,412 (78.6%), compared to 14.2% who were mild-moderately frail and 7.1% severely frail. Conclusions: A third of elderly patients presenting to our institution are frail. Admitted patients are more likely to be frail, whilst discharged patients are more likely to be non-frail. Determining the prevalence of frailty amongst ED elders is the first step towards providing targeted interventions to prevent the progression of frailty in our elderly.

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Geriatric Emergency Nurse Coordinator: an Evidence-Based Approach in Screening & Managing Geriatric Patients in Hong Kong Emergency Department

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Background and Objectives: Ageing population is a major public health concern in Hong Kong. Such dramatic increasing proportion of geriatric population will create a great burden on the health care system, especially for the service of emergency department (ED) including high re-attendance rate and hospitalization. In view of this, the objective of this study is to formulate an evidence-based discharge intervention guideline for geriatric patients in order to improve geriatric care in Hong Kong ED. Methods: This study was an evidence-based approach by using John Hopkins Nursing Evidence Based Practice Model (JHNEBP). After the literature review and appraisal, the literatures were then categorized into level 1 to V evidence with quality class A to class C. Findings were abstracted from the literatures based on different aspects including: patient characteristics, sample size, intervention, outcome measures, time interval of data collection, study result and recommendation. Results: An ameliorated geriatric front door program guideline was formulated after literatures appraisal. There are four main focus points in this guideline, forming a quick response team; to set up a clear inclusion and exclusion criteria of potential candidates; providing tailored made care plan; and extending the service time. A quick response team with the leading from Geriatric Emergency Nurse Coordinator (GENC) is suggested to facilitate screening and program implementation. Conclusions: Evidences showed that elderly care in ED can be improved by comprehensive geriatric assessment with timely referral, initiating patient-centered multi-modal care plan, and having link-nurse working with geriatricians. A well- formulated geriatric discharge intervention program with a GENC can provide a more comprehensive and effective geriatric care in Hong Kong ED.

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A Novel Nomogram For Predicting Mortality in Geriatric Patients with Dengue Fever

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Background and Objectives: Dengue fever (DF) causes a higher mortality in geriat-
ric patients (≥65 years) than in the younger patients. Because there is still no ad- equate method to predict mortality in the geriatric DF patients, we intended to de- velop a novel nomogram to clarify this issue. Methods: We recruited 627 geriatric DF patients who visited the study hospital between September 1, 2015, and De- cember 31, 2015 for this retrospective case-control study. Variables including de- mographic data, symptoms, signs, vital signs, comorbidities, laboratory data, and 30-day mortality were analyzed. Univariate analysis and multivariate logistic re- gression analysis were used to recognize independent mortality predictors, which were further combined to develop a nomogram for predicting death in this popu- lation. Results: The total mortality was 4.3% (27 patients died). The nomogram consisted three independent mortality predictors: bedridden (adjusted odds ratio [AOR]: 8.90; 95% confidence interval [CI]: 0.93-64.36), severe hepatitis (AST>1000 U/L; AOR: 53.19; 95% CI: 5.79-691.21), and renal impairment (se- rum creatinine > 2 mg/dL; AOR: 7.20; 95% CI: 1.42-37.63). Conclusions: We de- veloped a novel nomogram with user-friendly graphical interfaces which could generate the estimate to help predict mortality in geriatric DF patients. Further studies are warranted to validate its use. Corresponding Author: Wei-Ta Huang (ahdar0213@yahoo.com.tw)

Identifying Unmet Palliative Care Needs in the Emergency Department

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Background and Objectives: The goal of palliative care (PC) is to improve quality of life for patients that are facing a severe life-limiting illness. Many patients with advanced disease present to the Emergency Department (ED), particularly in the last months of life. Although some admissions to hospital are necessary towards the end-of-life, some may be avoided. A lack of communication between families and medical teams may result in admission and expensive medical management even if this no longer aligns with a patient’s goals of care. The aims of this study were to identify how many patients presenting to the EDs at the University Health Network (UHN) had unmet PC needs and to determine if admission to hospital could potentially be avoided if a rapid access follow-up PC clinic was available at UHN. Methods: UHN is an urban academic centre with EDs at two sites. A consecutively enrolled sample of 417 patients that presented to these EDs between July 1-August 14, 2018 was taken. Patients were eligible for screening if they (1) were >18 years of age, (2) had been designated a level 2-5 according to CTAS, and (3) had been triaged to the subacute or acute areas of the department. ED nurses and physicians were asked to complete a content validated PC screening tool on all eligible patients. Results: 45% of patients screened had a life-limiting illness and 30% had unmet PC needs. Among those with unmet PC needs, 79% had no identifiable involvement with a PC team. 73% of patients at UHN with unmet PC needs were likely to be admitted to hospital. In 14% (n=17) of these cases, admissions were felt to have potentially been avoided if rapid PC follow-up was available. Conclusions: A high percentage of patients presenting to the EDs at UHN have life-limiting illness with unmet PC needs. Corresponding Author: Erin O’Connor (erin.oconnor@gmail.com)

Incidence and Risk Factors of Delirium in Elderly Emergency Department Patients Bhumilod Adulayadej Hospital

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Background and Objectives: 1) to determine incidence of delirium in older ED pa- tients, 2) to identify delirium risk factor in older ED patients and 3) to characterize delirium by psychomotor subtype in the ED setting. Methods: This descriptive cross-sectional study was a convenience sample of patients enrolled at a tertiary care ED. Thai speaking patients who were 65 years and older presenting in the ED for less than 12 hours at the time of enrollment were included. Patientwere excluded if they refused consent, had severe dementia, were unarousable toverbal stimuli for all delirium assessments, or had incomplete data. Delirium status was determined by using Thai Confusion Assessment Method for the Intensive Care Unit (ThaiCAM-ICU) administered by trained research assistants. Multivariable logistic regression Scale was used to identify independent delirium risk factors. The Richmond Agitation and Sedation Scale was used to classify delirium by its psychomotor subtypes. Results: Inclusion and exclusion criteria were met in 242 patients and 29 (11.98%) presented to the ED with delirium. Based upon the multivariable model, Dementia and infection were significant risk factors at p val- ues of <0.01 and 0.01 respectively. The majority of delirious patients in ED had the hypoactive psychomotor subtype (51.72%). Conclusions: Delirium in elderly was a common occurrence in the ED and the vastmajority of delirium in the ED was the hypoactive subtype. Emergency physicians and hospital physicians always missed diagnosis. The most influent factor is dementia, antinfection, respectively. Using a delirium screening in risk group patients may decreasesmorbidty, length of stay and mortality.

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Massage-Induced Acute Compartment Syndrome: a Case Report

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Background and Objectives: Acute Compartment syndrome (ACS) is a condition in which pressure build-up within a closed osteofascial space compromises tissue circulation and function. The majority of reported literature is based on lower ex- tremity compartment syndrome, but any muscle group within an osteofascial compartment has the potential to develop compartment syndrome. The main objec- tive of this case report is to present a rare case of ACS on the left shoulder from a massage session. Methods: - Results: This is a case of a 45 yf female who, dur- ing a consult with a local witch doctor or "Albularyo", had her left arm suddenly pulled posteriorly, causing extreme pain & swelling of the affected arm. Patient consulted at a local hospital, where she was diagnosed to have ACS of the left upper extremity secondary to an infra-glenoid bone fracture with shoulder disloca- tion. She underwent fasciotomy and was discharged improved. In the interim, there was progression of swelling, prompting consult at our ER, where the 6cm post-incision site on the left antero-lateral chest and at the posterior left upper arm was swollen and erythematous with yellowish discharge. Stat MRI showed myo- necrosis and diffuse cellulitis. Patient underwent fasciotomy and evacuation of hematoma & débridement of the post-operative sites. Intraoperatively, there was profuse bleeding & necrosis. Patient’s condition worsened on background of pre- sumed sepsis, metabolic encephalopathy and DIC. On cranial CT scan, there was note of hypoxic ischemic encephalopathy on top of hemorrhage. After transfer to an intensive monitored unit, patient eventually expired. Conclusions: To our knowledge, we report the only case of a patient with an Infra-glenoid bone closed fracture that developed an acute compartment syndrome of the left extremity. Ur- gent diagnosis and surgical treatment with decompressive fasciotomy is the key to optimizing functional outcome. We recommended vigilant post-fasciotomy wound care to avoid infection and deterioration into sepsis.

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Life Threatening Closed Internal Degloving Injury

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Background and Objectives: Closed internal degloving injury occurs when a shear- ing force is applied to the body after trauma, resulting in separation of the dermis and the hypodermis from the underlying muscle fascia. The separation of subcu- taneous tissue from the underlying fascia leads to hemolympatic fluid collection between the tissue layers. However, this injury rarely causes hemorrhagic shock. Methods: We reviewed the medical record of a 79-year-old woman was brought to the emergency department (ED) after traffic accident Results: A 79-year-old woman was brought to the ED after traffic accident. She was in a stuporous state and showed hypotension. The sources of bleeding were not observed on FAST and physical examination during primary survey. Abdominal CT showed huge hematoma with contrast media extravasation on lower back and gluteal area. Compression bandage was applied in the ED and open debridement was per- formed due to skin necrosis. In the theater, soft tissue was separated from the muscle. After these surgical procedures, several times of wound debridement and skin graft were performed. Conclusions: The diagnosis of closed internal deglov- ing injury can be delayed or missed if emergency physicians will care for only visible injury. In addition, this injury can acutely develop hemorrhagic shock es- pecially when vessel injury is accompanied.
Clinical Interventions For Decreasing Major Depression Developed by Spinal Fracture: a National Database Study

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Background and Objectives: Chronic pain and poor activity of daily living after spinal fracture may induce the occurrence of major depression (MD); however, risk factors investigation regarding medications, surgical intervention, and severity of fracture is not clear. We aimed to analyze the risk factors of MD after spinal fracture on medications, surgical interventions, and severity of fracture. Methods: This study retrospectively obtained the data from health care database of Taiwan government (2003 to 2007). There were 11,225 patients suffering new spinal fracture (study group), and 33,675 matched non-fracture patients (comparison group). We respectively traced each for them three years to analyze the development of MD. The Cox proportional hazards model was used to determine the prevalence of MD after adjusting for patient demographics, medications, surgical interventions, spinal cord involvement and post-fracture comorbidities. MD-free survival curve was also analyzed. Results: There were 187 fracture patients (1.7%) and 281 non-fracture comparison patients (0.8%) suffered from new-onset MD. Hazard ratio (HR) for occurring MD among the study patients was 1.96 (CI 95%: 1.63-2.36) compared with the comparison group. Spinal cord involvement (HR: 2.96, 95% CI: 2.54-3.42) and post-fracture comorbidities (HR: 3.51, 95% CI: 2.36-3.97) obviously increased the risk. Early surgical interventions and medications were effective for decreasing the risk, particularly treatment with vertebroplasty (HR: 1.54, 95% CI: 1.15-2.05) and narcotics (HR: 1.24, 95% CI: 1.06-1.54). The largest proportion of MD (15.5%) occurred within the first 100 days after fracture. Conclusions: Patients with spinal fracture are more likely to develop MD, and this risk is markedly increased in those with spinal cord involvement and post-fracture comorbidities. Early surgical interventions and medications are effective for decreasing the risk, particularly treatment with vertebroplasty and narcotics. Most importantly, most MD occurred within the first 100 days after fracture.

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A Case Report of Axillary Artery Injury After Anterior Shoulder Dislocation

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Background and Objectives: Shoulder joint is one of the most commonly dislocated joints that present to Emergency Department. Common complications include rotator cuff injuries and recurrent dislocations. However, axillary artery injury with out bone fracture is extremely rare. Approximately 200 cases are reported in the literature. Authors would like to raise awareness and highlight population groups that are more likely to be at risk of axillary artery injury. Methods: A 62 year old gentleman presented to Emergency Department after a mechanical fall at home. He had a history of brachial plexus injury in the past due to intramuscular haematoma after a fall. His medications included warfarin for previous stroke. He sustained an isolated injury to his right shoulder which was anteriorly dislocated. It was reduced with minimal traction. The neurovascular status was initially normal. However, he continued to complain of worsening right shoulder pain. During observation, his haemoglobin count dropped by 4 and had a syncopal episode in the department. Haematoma was observed over the right axilla with absent distal pulses. CT angiogram of right upper limb revealed acute ischaemic limb with no axillary artery flow with surrounding haematoma. He was brought to theatre for axillary and brachial bypass. He has since made a full recovery.

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missions, the types of requestors, the districts of request are investigated. **Results:** The numbers of requests and transportations are increasing at 2 hospitals. The largest group of transferred patient’s age was 70’s. The bad weather was the most frequent reason for the canceled or declined missions. The other reasons of canceled mission were different the hospital to hospital. The problems with the landing zone were occurred in only 2 hospitals. The requests were concentrated in small number of districts at specific hospital. The rate of on-scene request from EMS was quite different with hospitals (5.1 vs. 11.9 vs. 32%). All on-scene requests were made by EMS the latter 2 hospitals (11.9, 32%). **Conclusions:** The rate of on-scene request from EMS was various according to the hospitals. The definite guidelines for the on-scene HEMS request are needed. The cooperation between EMS and the HEMS hospital is essential.

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To Sail or to Fly, Inter-hospital Transfer Struggles in a Very Remote District Hospital in Central Borneo

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**Background and Objectives:** Inter-hospital transfer is required when specialized care is needed. Facial gunshot wounds are often fatal; associated with difficult airway and poor neurological outcome. Hospital Kapit,a district hospital with very limited facilities located in a jungle and is only accessible by river or air makes inter-hospital transfer of such critically injured patients a major challenge.

**Methods:** Reviewing case notes. **Results:** We report a case of multiple facial gunshot wounds that required pre-transfer stabilization, preparation and choosing the best mode of transfer. Patient was a 32 year old gentleman who was shot in the left face while collecting debts. He sustained multiple penetrating injuries to his face with profuse bleeding. X-ray showed 11 bullets in his face and upper cervical region. Patient was intubated for airway compromise but failed intubation due to severe structural damage in the oral cavity. Surgical Airway was done. However, it was complicated with surgical emphysema and the inability to maintain adequate oxygenation. Conversion of surgical airway to a definitive airway was decided as SpO2 was borderline. Re-intubation attempted was successful. Patient was transfused with 4 pint packed cells to maintain hemodynamic stability. Patient was transferred using air transfer despite the possibility of an obstructed airway. Intervention for patient during air transfer would be impossible due to confined space. Ground transfer using boat takes 4 hours; requires manipulations to put patient into the boat and airway, and patient privacy in Kapit. Communication with multiple disciplines in the receiving hospitals were done and a level 3 transfer team was dispatched to ensure patient’s safety during transfer. Patient arrived at the airport where detailed handing over and transferring was done. He arrived to the receiving hospital with no complications. **Conclusions:** In conclusion, a good pre-transfer management and preparation in a remote district hospital is vital for a patient’s survival. The availability and choice of inter-hospital transfer is vital to ensure the optimal outcome of patients.

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“You Can’t Fly with Broken Wings, but You Can Fly with a Broken Heart”: A Case of Failed Thrombolysis ST-Segment-Elevation Myocardial Infarction (STEMI) Transferred Via Air Ambulance

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**Background and Objectives:** The main advantage of using air ambulances include patients are able to be transferred from one location to a more advanced medical facility more quickly as compared to use of other means of transportation. It is very helpful in transferring cases with serious medical condition such as STEMI. However, air ambulances have their own limitations such as weather condition and very limited space. **Methods:** A 56 year old gentleman, a chronic smoker presented to our Emergency Department with squeezing central chest pain that started 2 hours before admission. He was hemodynamically stable and ECG showed anterior STEMI. He was thrombolysed with streptokinase and was subsequently admitted to the Intensive Care Unit. However, patient was still symptomatic and the repeated ECG showed no resolution. On the next day, he was transferred to the nearest PCI hospital for rescue PCI using fixed-wing air ambulance with on-going nitrate infusion. The transportation was uneventful. Coronary angiogram demonstrated triple vessel disease. 2 stents were deployed in the left anterior descending (100% stenosis) and left circumflex artery (80% stenosis). The right coronary artery with 60-70% stenosis was planned for elective PCI later. **Results:** Patient was discharged well 4 days later and went back to his hometown. Unfortunately, patient developed another episode of similar severe chest pain 1 hour before admission. This time he was diagnosed with acute inferior STEMI with cardiogenic shock. He was thrombolysed with tenecteplase. He remained hemodynamically unstable and need vasopressor support. On the next day, he was transferred again for rescue PCI using fixed-wing air ambulance. This time the right coronary artery was stented successfully and discharged well after few days. **Conclusions:** The patient was very unfortunate to have double episodes of STEMI and double thrombolytic failure. However, patient was very fortunate to have double uneventful air ambulance transportation and double successful PCI.

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**PO_AERO_01_04**

Impact of Real-time Operation of a Doctor Dispatch System Activated by Advanced Automatic Collision Notification Relayed After Traffic Accidents: the D-Call Net System in Japan

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**Background and Objectives:** In Japan, 3,694 people died (within 24 hours of the accidents) in 2017. In 2015, physician onboarding helicopter system called “Doctor-Heli” in Japan was extended to allow for activation by automotive engineering data collected during accidents (Advanced Automatic Collision Notification [AACN]) called D-Call Net. **Methods:** Shortly after a traffic accident, data on the magnitude and direction of the impact, use of seatbelts are relayed by the vehicle’s acceleration sensor to servers in a dedicated call center. The predicted severity of injury of the occupants is calculated using a dedicated algorithm. The automotive engineering data and predicted severity of injury are then relayed to a Doctor-Heli base hospital and the doctor dispatch system is activated automatically. **Results:** In January 2018, a passenger car driven by a 56-year-old man collided with another car. One minute after the accident, the D-Call Net relayed the relevant information to a tablet device at base hospital. The Doctor-Heli arrived at the scene just 19 minutes later (30 km from the base hospital; 45 minutes by ambulance). One of the patients was moderate severely injured (Injury Severity Score 12). **Conclusions:** This case is the first case of actual physician contact made using the automatic system in the world where a doctor dispatch system was activated based on engineering data of traffic accident. The system has the potential to operate in other countries to reduce deaths and the severity of resulting injuries due to traffic accidents.

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**PO_RCH_03_01**

Comparison of On-scene Endotracheal Intubation and Bag-valve-mask Ventilation in Out-of-hospital Cardiac Arrest Patients

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**Background and Objectives:** In out-of-hospital cardiac arrest patients, there were only 10% of population who had return of spontaneous circulation (ROSC) after resuscitation and survival to discharge without poor neurological outcome. The survival of OHCA patients depends on several factors such as bystander chest compression, rapid public access defibrillation, early access of emergency medical team and advanced cardiopulmonary resuscitation. In Thailand, cardiac arrest patients will receive an advanced airway management either by endotracheal intubation (ETI) or bag-valve-mask ventilation (BVM) depending on the specialty of pre-hospital providers. The objective of this study was to compare the effect of advanced airway management techniques (ETI vs. BVM) on survival outcome in
OHCA patients. Methods: The study was retrospective cohort study which collected the OHCA patients’ information from the nationwide electronic database of Thailand National Institute of Emergency Medical Service (NIEMS) between January to May 2017. The primary outcome was a number of survivals to ED admission and secondary outcome was to identify the factors which associated to survival outcome. Results: There were 1,070 eligible patients in this study, 800 (74.8%) were BVGM group and 270 (25.2%) were ETI group. The proportion of survival to ED admission was 157 (19.6%) vs. 42 (15.6%) in BVGM group and ETI group respectively, p-value was not significant. By the multivariable analysis, endotracheal intubation was not increase the survival outcome of OHCA patients (OR 0.79, 95% CI 0.54-1.16, p-value 0.237). The factors which associated to survival outcome including on-scene defibrillation (OR 2.03, 95% CI 0.60-6.89, p-value 0.255) and intravenous fluid administration (OR 1.44, 95% CI 0.68-3.05, p-value 0.336). Conclusions: There was no difference of survival outcome in OHCA patients who performed advanced airway management either by endotracheal intubation or bag-valve-mask ventilation.

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Does CPR RsQ Assist® Improve Chest Compression Quality? a Study on Manikin Model

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Background and Objectives: High quality chest compression affects to the survival outcome of patients with sudden cardiac arrest. To improve the quality, CPR RsQ Assist will set rhythmic sound for appropriate compression rate and it covers on the chest area more than using our hands thus decreases chance of hands displacement. This study aims to compare the effectiveness of CPR RsQ Assist in quality chest compression vs. the conventional method. Methods: It was a randomized experimental study with total of 133 participants include emergency physicians, emergency nurses, paramedics, emergency technicians and faculty’s students. Participants were randomized by SNROSE to perform chest compression on manikin model for 2 minutes by using CPR RsQ Assist or manually as the first method then crossing over to perform other method in one or more days later. The outcome parameters include mean compression rate and depth, percentage of correct hand position and fully recoil after compression. Results: 69 participants were male, mean age was 22.4±4.5, mean BMI was 22.2±4.2 and 105 have been trained in 2015 AHA CPR curriculum. The mean compression rate was 117.8±18.8 in device group and 118.2±16.4 in conventional group, there was no statistical significance. The mean compression depth was deeper in device group (45.4±8.2 vs. 43.2±10.2, p-value 0.002). The percentage of correct hand position was higher in device group (89.4±22.5 vs. 82.3±28.2, p-value 0.021) but there was no statistical significance in percentage of fully recoil after compression (96.0±16.0 in device group and 93.7±19.7 in conventional group). Conclusions: CPR RsQ Assist can improve quality of chest compression by reaching compression depth closing to the 2015 AHA recommendation and allow appropriate hand position when perform chest compression. Mean compression rate and percentage of fully recoil was no different from conventional chest compression.

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PO_RCH_03_02

Outcomes of Medical Admissions in Relation to Modified Early Warning Score

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Background and Objectives: The Early Warning Score (EWS) is a simple physiological scoring system that is suitable to be used in a busy clinic setting such as Emergency Department (ED). The MEWS is a well-known EWS that can be used to identify patients at risk of mortality. To determine the outcome of medical admissions in terms of in-hospital mortality, risk of transfer to critical care unit or higher level of care and length of hospital stay in relation to MEWS. Methods: A prospective cohort study of adult medical patients (≥ 18 years) presented to ED Hospital Universiti Sains Malaysia and subsequently admitted to the medical ward. In-hospital mortality, risk of transfer to critical care unit and total length of stay was assessed in relation to low-risk (score ≥ 3) and high-risk MEWS (score ≥ 5). Results: From this study, it was shown that mortality was higher in patients from high-risk group, which there was significant difference in terms of in-hospital mortality between the low and high-risk group. 40.6% (n=28) of the high-risk group had been transferred to higher level of care, whereas only 14.6% (n=10) of the low-risk group. This was shown that there was significant difference in terms of risk of transfer to higher level of care between the low and high-risk group. For the low-risk group, the mean length of stay was 5.58 days, whereas for the high-risk group, the mean length of stay was 7.22 days. Conclusions: It can be difficult to identify medical patients who presented to ED with risk of deterioration that need higher level of care. Besides using clinical evaluation, Modified Early Warning Score (MEWS) can be used as an added tool in ED to risk stratify medical patients with higher risk of mortality.

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The Impacts of Oxygen and Medicine in Immune Cells in Hypoxic Condition

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Background and Objectives: Many patients admitt the emergency department due to trauma. These patients with massive hemorrhage, respiratory failure, and further that the experience can fall into hypovolemic shock. In the treatment of shock patients, airway maintenance and oxygen supply are known to be of paramount importance. Therefore, this aim of study was to investigate to effects of oxygen supply and variable medication in hypoxic condition. We conducted an experiment to determine effect of oxygen and variable medication. Methods: The experiments were performed with THP-1 derived macrophage and Jurkat cells. First, macrophage cells put through normoxic state, hypoxic state, oxygen supply and variable medication, and measured the iNOs, MIF by western blots. Second, Jurkat cells also were incubated in the same way as in the first instance, and measured MTT, IL-2 and IL-8. Third, in co-culture, after Jurkat cells under hyperinflammatory macrophage cells were incubated through hypoxic state, oxygen supply and variable medication, and measured MIF and IL-8. Results: iNOs and MIF increased in hypoxic state in macrophage cells. Pentoxifylline (PTX) under oxygen supply condition restored iNOs in stimulated macrophage. MTT and IL-2 decreased and IL-8, MIF increased in hypoxic condition, however PTX and steroid restored IL-8, MIF. In coculture condition, oxygen supply and pentoxifylline more increased MTT, IL-2 than PTX in hypoxic state, Conclusions: Hypoxia decreased T cell viability. iNOs, MIF and IL-8 increased in hypoxic state rather than normoxic state. However, PTX restored T cell viability, IL-2 in oxygen supply condition than the hypoxic state.

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PO_RCH_03_04

Heart Rate N-Variability: A Novel Representation of Beat-to-Beat Variation in Electrocardiography

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Background and Objectives: Heart rate variability (HRV), a widely adopted tool in evaluating changes of cardiac autonomic regulation, is believed to strongly associate with autonomic nervous system. HRV has gained reputation in broad clinical applications, particularly in cardiovascular research where reduced HRV is correlated with various adverse outcomes. So far, majority of efforts are deriving sophisticated parameters with linear and nonlinear techniques. Furthermore, researchers have been focusing on developing advanced signal processing tools for efficient noise removal and accurate QRS detection, prior to HRV parameter calculation. Methods: We propose a novel representation of beat-to-beat variation in ECG, called heart rate n-variability (HRnV), as an alternative to conventional HRV. The derivation of HRnV parameters are based on RR intervals with or without overlaps. We can create many sets of HRnV parameters which are promising at generating extra information from limited data source. We conducted a simulation study by using the ECG record of subject #16265 from MIT-BIH Normal Sinus Rhythm Database. We applied the conventional Pan-Tompkins QRS detection algorithm including band-pass filter (5-15 Hz), derivative fil-
ter, and moving average to detect QRS peaks. Subsequently, we extracted a 30 minutes segment and derived HRV parameters. **Results**: Among the time domain parameters, we observed that the values were generally incremental with the increase of n. We observed the same trend of value change in frequency domain parameters. In non-linear analysis, the differences between HRV and HRV on Poincare plot measures were obvious, while those on entropy and detrended fluctuation analysis (DFA) metrics were not. **Conclusions**: HRV measures enable us to augment the conventional HRV with many more parameters. We believe that HRV is an important addition to HRV and will contribute to extending the landscape of current studies on HRV.

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**PO_RCH_03_06**

**Melatonin Protects Autophagy-like Cell Death Cerebellar Purkinje Cells Following Asphyxial Cardiac Arrest through Attenuation of Oxidative Stress Via MT2 Receptor**

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**Background and Objectives**: Although multiple reports using animal models have confirmed that melatonin appears to promote neuroprotective effects following ischemia/reperfusion-induced brain injury, the relationship between its protective effects and the activation of autophagy in cerebellar Purkinje cells following asphyxial cardiac arrest and cardiopulmonary resuscitation (CA/CPR) remains unclear. **Methods**: Rats used in this study were randomly assigned to 6 groups as follows: vehicle-treated sham-operated group, vehicle-treated asphyxial CA/CPR-operated group, melatonin-treated sham-operated group, melatonin-treated asphyxial CA/CPR-operated group, melatonin plus (+) 4P-PDOT (a MT2 melatonin receptor antagonist)-treated sham-operated group and melatonin+4P-PDOT-treated asphyxial CA/CPR-operated group. **Results**: Our results demonstrate that melatonin (20 mg/kg, ip, 1 time before CA and 4 times after CA) significantly improved the survival rates and neurological deficits compared with the vehicle-treated asphyxial CA/CPR rats (survival rates: 70% vs. 40%). We also demonstrate that melatonin exhibited protective effect against asphyxial CA/CPR-induced Purkinje cell death. The protective effect of melatonin in the Purkinje cell death following asphyxial CA/CPR paralleled a dramatic reduction in superoxide anion radical (O₂⁻), intense enhancements of Cu/Zn superoxide dismutase (SOD1) and MnSOD (SOD2) expressions, as well as a remarkable attenuation of oxidative stress following increasing SODs. Thus, we strongly suggest that fucoidan can be used as a useful preventive agent in cerebral ischemia.

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**PO_RCH_06_01**

**An Exploration of Burnout and Coping Styles Amongst Multidisciplinary Emergency Department Staff: Quantitative Analysis of a Multisite Cross-sectional Survey**

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**Background and Objectives**: Prior to targeted interventions to reduce burnout amongst emergency department (ED) staff, information regarding its nature is required to inform same. **• Describe patterns of burnout and coping-styles of ED staff. • Compare measures between sites. • Explore differences in burnout and coping-styles by age, gender, role, work pattern.** **Methods**: Multidisciplinary staff at one metropolitan and one regional public ED (Queensland, Australia) were invited to complete a survey-suit including Maslach Human Services Survey and Jalowiec Coping Scale (JCS). Derived scores were compared across sites and by covariates of interest by fitting linear regression models. Multivariable models were built as appropriate. **Results**: Of 204 completed surveys 70% were females, 49% nurses, 31% medical, 8% allied-health, 12% support staff (return rates 79% and 65%). Over 60% reported burnout: high scores in all three Maslach domains occurred in 9% with 26% and a further 27% reporting high scores in two and one domain(s) respectively. No site differences detected. 39% had high emotional exhaustion scores, while 45% and 24% reported high scores in the depersonalisation and personal accomplishment domains respectively. The overall mean item use (MIU) score for JCS ranged from 1.7-2.2. No site differences detected for any of the coping-styles by age, gender, role, work pattern. **Conclusions**: Differences in patterns of burnout by subscale and staff-types were detected along with coping-style differences; these may be of utility in designing targeted interventions.

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**PO_OTO_01_01**

**Topical Tranexamic Acid in Epistaxis-a Systematic Review**

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**Background and Objectives**: Epistaxis is commonly encountered in the emergency department with up to 80% of cases having an unknown aetiology. Though often self-limiting, it can prove a life threatening condition particularly in the elderly and those with underlying conditions. A number of treatment strategies exist including the use of haemostatic agents such as tranexamic acid (TXA). This can be applied locally or systemically and a number of studies have evaluated both. The aim of this study is to evaluate the efficacy of topically applied tranexamic acid in the management of epistaxis. **Methods**: A systematic review of all the published...
Accuracy of Canadian Triage and Acuity Scale and Emergency Severity Index in Emergency Department of Maharaj Nakorn Chiang Mai Hospital
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Background and Objectives: The triage system used nowadays, regarded as highly accurate, divides patients into five emergency levels. The Canadian Triage and Acuity Scale (CTAS) is used in Maharaj Nakorn Chiang Mai hospital, while Emergency Severity Index (ESI) is used in most of other Thai hospitals. Both have five emergency levels. Presently, there is still no comparative study into which system has higher accuracy. The main objective of this study was to find the accuracy between the two systems and the correlations between hospitalization and 24-hour mortality rate. The secondary objective was to find the correlations between the level of emergency and resources utilization in emergency department.

Methods: This was a prospective cohort study, collecting data of CTAS and ESI at emergency department, Maharaj Nakorn Chiang Mai hospital between January and June 2018. Results: 413 patients were included in this study. The rate of hospitalization and 24-hour mortality were higher in the more severe of emergency level (p-value 0.000). Most of resource utilization in emergency department was also higher in the more severe of emergency level (p<0.05) as well, except defibrillation and external pacing, intramuscular drug injection and complex procedures. The data of CTAS and ESI were well correlated (weight kappa=0.667).

Conclusions: The level of emergency of CTAS and ESI were associated with the rate of hospitalization and 24-hour mortality rate. The higher rate of resources used in emergency department also correlated with the more severe level of emergency. Data collected from CTAS and ESI were well correlated.

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Syndrome of Inappropriate Anti-diuretic Hormone Secretion Caused by Non-functioning Pituitary Macroadenoma
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Background and Objectives: Pituitary macroadenoma is an example of an endocrine disorder which is associated with hyponatraemia. In majority of these cases, hyponatraemia is due to secondary hypotuitarism, more specifically central adrenal insufficiency or central hypothryoidism. However, hyponatraemia can also be caused by syndrome of inappropriate anti-diuretic hormone secretion (SIADH) in such cases though this occurrence is much less common. It has been postulated that the increased secretion of ADH could have been due to local mechanical stress exerted by the pituitary macroadenoma. Methods: A 65-year-old Chinese gentleman presented to the Emergency Department with 1-week history of generalised fatigue, weakness and loss of appetite. He also had 1-day history of nausea and vomiting that was non-bloody, non-bilious and contained yellow fluids. He did not complain of any abdominal pain, change in bowel movements, headache, dizziness or visual disturbances. Systems review was unremarkable and he had no significant past medical history. Results: Laboratory investigations revealed hyponatraemia, plasma hypo-osmolality with urine that was not maximally diluted, increased level of urine sodium excretion, and normal functioning kidneys, thyroid and adrenal glands. These findings are consistent with that of syndrome of inappropriate antidiuretic hormone secretion. Other hormonal tests also revealed central hypogonadism and growth hormone deficiency. Brain magnetic resonance imaging showed a pituitary adenoma measuring 16 × 30 × 24 mm in size with suprasellar extension, displacing the optic chiasm superiorly and compressing the suprasellar cistern and hypothalamus.

Conclusions: In conclusion, we have described a case of non-functioning pituitary macroadenoma causing hypopituitarism and SIADH, resulting in hyponatraemia. The pituitary tumour exerted mechanical stress on the pituitary stalk and hypothalamus, causing inappropriate secretion of ADH. Hence, in future clinical practice, when a patient with a pituitary macroadenoma presents with hyponatraemia, it is important to not only consider hypopituitarism, but also SIADH as a possible cause for the hyponatraemia.

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Delta Neutrophil Index as a Department of Emergency Medicine in an Urban Area of Tokyo
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1 Emergency Medicine, Tokyo University School of Medicine, Japan; 2 Internal Medicine, Tokyo University School of Medicine, Japan

Background and Objectives: Anaphylaxis is a severe, potentially fatal, systemic allergic reaction. Both treatment of allergic symptoms and prevention of future anaphylactic episodes are clinically important. We have strongly recommended that patients visit our outpatient allergy clinic. To classify the clinical features and triggers of anaphylaxis in patients (>15 years old) in an urban area of Tokyo. Methods: We used the medical records to analyze patients with anaphylaxis as the primary diagnosis who visited the emergency department in our hospital from January 2015 through December 2017. Results: Among approximately 60,000 patients who visited the emergency department, 181 subjects (mean age, 43.0; 44.8% male) were diagnosed with anaphylaxis. Fourteen of those patients had a systolic blood pressure of lower than 90 mmHg. Upon arrival, 126 patients were treated with adrenaline. All patients recovered from the anaphylactic episode. Subsequently, 134 patients visited our outpatient allergy clinic. The trigger of the anaphylaxis was identified in 131 patients; the most common trigger was a food (n=78), followed by drugs (n=38), insect stings/bites or animal bites (n=3) and others (n=11). Adrenaline auto-injectors were prescribed to 84 patients. Conclusions: It is important for patients with anaphylaxis to undergo allergy testing after discharge from an emergency department. Collaboration between emergency medicine and allergy departments may be helpful for improving the patients’ QOL through effective prevention of recurrent anaphylaxis.

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Delta Neutrophil Index as a Department of Emergency Medicine in an Urban Area of Tokyo
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Prosthetic Hip Dislocation Presenting to Emergency Department of Tan Tock Seng Hospital

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Background and Objectives: With an aging population that is living longer, an increasing incidence of osteoporotic hip fractures and resultant prosthetic implantation has led to a rise in prosthetic hip dislocations. This study compares patients with first and recurrent prosthetic dislocations presenting to Tan Tock Seng Hospital (TTSH) Emergency Department (ED). Methods: A retrospective review was conducted on prosthetic dislocations between 1 Jan 2008 and 31 Dec 2015. Patients below 21 years old were excluded. Using descriptive and summary statistics, these factors were analysed: demographics, previous dislocations, aetiology; severity, ED and inpatient management, and complications. Results: Forty-six patients contributed to 73 ED encounters. Most patients were elderly (73.9%) females (67.4%). Mean age of patients was 70.3 (SD16.0). Of the 46 patients, 22 had first prosthetic dislocation. Twenty-four had recurrent prosthetic dislocations (52.2%) accounting for 47 ED encounters (64.4%) ranging from 2-9 dislocations/patient. Both first and recurrent prosthetic dislocation numbers (p<0.05) and encounters (p<0.01) were significantly more common in elderly female patients with mean age of 71.8 years (SD12.1) and 77.0 years (SD13.2) respectively. Movement associated with activities of daily living was the commonest cause of both first (46.4%) and recurrent dislocations (34.9%). Most patients (93.5%) underwent Manipulation & Reduction (M&R) in the ED, with a 69.8% success rate. Median hospitalisation duration was 8.7 days (IQR2-14) amongst admitted patients (87.0%). Recurrent dislocations required shorter duration of stay at 1.0 days (IQR1-3) than first dislocations at 8.0 (IQR3-18). Of all admissions, successful M&R in ED was associated with a significantly shorter (p<0.05) mean duration of stay at 4.4 days (SD5.5) than unsuccessful M&R in ED at 9.7 days (SD7.7). Conclusions: First and recurrent prosthetic dislocations occurring secondary to low-energy transfer events were commoner in elderly women who needed short hospitalisation. Potential for 24-hour admission for functional recovery in the ED should be explored for this group.

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Implementing Buprenorphine/Naloxone in Emergency Departments For Opioid Agonist Treatment: A Quality Improvement Initiative

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Background and Objectives: Buprenorphine/naloxone (bup/nal) is a partial opioid agonist/antagonist and recommended first line treatment for opioid use disorder (OUD). Emergency departments (EDs) are a key point of contact with the health-care system for patients living with OUD. We implemented a multi-disciplinary quality improvement project to screen patients for OUD, initiate bup/nal for eligible individuals, and provide rapid next business day walk-in referrals to OUD clinics in the community. Methods: From May to September 2018, our team worked with three ED sites and three OUD clinics to pilot the program. Implementation involved alignment with regulatory requirements, physician education, ensuring in-ED medication access, and point of care education. For our pilot, our evaluation objective was to determine the degree to which our initiation and referral pathway was being utilized. We used administrative data to track the number of patients given bup/nal in the ED, their demographics and whether they continued to fill bup/nal prescriptions 30 days after their ED visit. OUD clinics reported both the number of patients referred to them and the number of patients attending their referral. Results: Administrative data shows 568 opioid-related visits to ED pilot sites during the pilot phase. Bup/nal was given to 60 unique patients in the ED during 66 unique visits. 24 (41%) discharged patients given bup/nal in ED continued to fill bup/nal prescriptions 30-days after their index ED visit. EDs referred 37 patients, with or without bup/nal initiation, to the 3 participating clinics. 16 of those individuals (43%) attended their first follow-up appointments. Conclusions: Our pilot project demonstrates that with dedicated resources and broad institutional support, ED patients living with OUD can be appropriately initiated on bup/nal and rapidly referred to ongoing addiction care in the community.

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Routine HIV Testing in the Emergency Department: A Systematic Review Looking at Feasibility and Acceptability of Implementation

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Background and Objectives: HIV presents a significant public health problem. 12% of the UK’s HIV-positive population remain undiagnosed. Emergency Department (ED) presentations offer an ideal opportunity to address this unmet need. Current United Kingdom guidance (from both the National Institute of Clinical Excellence and the Royal College of Emergency Medicine) suggests that routine HIV testing programmes are currently being rolled out in EDs across the western world. However, the feasibility and acceptability of routine testing should be provided upon presentation to ED in high prevalence areas. As HIV testing programmes are currently being rolled out in EDs across the western world, this systematic review aims to assess the feasibility (the proportion of eligible patients offered testing) and acceptability (the proportion of those patients who accepted testing) of HIV testing to ED patients. Methods: We conducted a PubMed literature search using keywords ([HIV test] AND [Emergency Department] OR [Accident and Emergency]). 522 papers were initially screened and 60 were reviewed in full, resulting in inclusion of 24 studies. Only studies including adult (16+) patients presenting to EDs across North America and Europe were included. Results: Study size varied widely from 329 to 183,857 eligible patients, representing both single and multi-centre trials. Feasibility was an outcome in 14 studies and acceptability in 18, with 10 studies investigating both. Average feasibility adjusted for study size was 30.5% and average accept-
Syncope: Experience From a Tertiary Emergency Department in Singapore

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Background and Objectives: Syncope is defined as a transient loss of consciousness due to cerebral hypoperfusion with spontaneous recovery. It is a common medical problem associated with a wide variation in adoption of recommendations from published guidelines. Our objective was to review the characteristics and management of patients presenting with syncope to our emergency department (ED).

Methods: A review of electronic medical records was conducted retrospectively. Patients aged 18 and above who were diagnosed with syncope in the ED from January to June 2018 were included. Data collected included patient demographics, diagnostic tests performed, length of stay (LOS) and eventual diagnosis made.

Results: A total of 280 patients were included (48% males, 52% females). The mean age was 50 years. Reflex syncope was the most common cause (63%), followed by orthostatic syncope (13%) and cardiogenic syncope (4%). 20% of patients were discharged with no clear cause identified. 159 patients were admitted for further evaluation, of which 139 patients (87%) had troponin I performed and 57 patients (36%) underwent telemetry monitoring. The median LOS for patients placed on telemetry was 4 days compared to 2 days for patients without telemetry.

Conclusion: Cardiac syncope was the final diagnosis in 12 patients. Further work and quality improvement is needed to develop a dedicated syncope unit as recommended by the European Society of Cardiology to expedite evaluation, limit diagnostic work up and prevent unnecessary hospitalizations in low risk patients to reduce healthcare costs.

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Two Cases of Pulmonary Edema After Hyperbaric Oxygen Therapy
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Background and Objectives: Although the indications or efficacy of hyperbaric oxygen therapy (HBOT) in patients with carbon monoxide (CO) poisoning, numerous healthcare institutions worldwide administer HBOT on patients with CO poisoning in order to suppress the progression of major organ damage, such as the heart, brain, lungs, kidneys, and muscles, in the acute and chronic phases. Patients with CO level of 25% or higher (20% or higher for pregnant women), loss of consciousness, severe metabolic acidosis (pH<7.1), and evidence of end-organ ischemia are classified as a high-risk group, and these are considered the indications of HBOT. Potential complications of HBOT include fatigue, lung injury, middle ear damage, nasal cavity damage, visual impairment, and respiratory failure, pulmonary edema, and convulsion due to oxygen toxicity. Here, we report two cases of pulmonary edema that occurred after HBOT at our institution.

Methods: Two case reports. 74-year-old woman 80-year-old man.

Results: When a patient with CO poisoning is classified as a high-risk patient and is indicated for HBOT, our institution aggressively recommends HBOT in order to minimize acute and chronic injuries of major organs. Among complications of HBOT, pulmonary edema is rarely reported. Weaver et al. reported three cases in 2001, and all three patients had underlying heart disease and two also had diabetes. Although it has been reported that low left ventricular ejection fraction increases the risk for pulmonary edema, there have been no studies specifically investigating the topic. The suggested mechanisms involve increased cardiac afterload as hyperoxemia induced by HBOT contracts peripheral blood vessels, increased cardiac muscle stress due to oxygenation, reduced left ventricular compliance due to a reduction of free oxygen-dependent nitric oxide production, the imbalance between right and left ventricles, and increased pulmonary capillary permeability. Furthermore, HBOT is known to induce substantial stress on the ventricular walls by increasing NT pro-BNP by an average of 100 pg/mL in patients with diabetes. The major treatment for acute pulmonary edema caused by HBOT is symptomatic therapy, such as the use of diuretics, oxygen supply, and sometimes assisted respiration. Moreover, multiples studies reported that HBOT should be administered with caution or should be prohibited for patients with any form of lung disease or pulmonary collapse, fever, cold, recent ear surgery or history of ear injury, or claustrophobia.

Conclusions: Acute pulmonary edema after HBOT in patients with underlying heart disease is a rare but serious complication. Therefore, physicians must take special attention when administering HBOT in patients with underlying heart disease or have low left ventricular ejection fraction. Through these two cases, we learned that individual assessment is crucial for each patient regarding the benefits and harms of HBOT and that special attention should be paid to elderly patients because they are likely to have heart failure or diabetes.

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