Results: We reviewed 1,408 studies and selected 44 for full review (kappa = 0.70). Thirty-three were excluded due to wrong patient population and non-analgesic use of ketamine. Eleven studies with 1,249 participants were included - six randomized control trials (RCTs) and five observational studies. All of which had an overall low risk of bias. There was extensive variation in the dose and route of LDK used (0.1 - 0.7 mg/kg SC/IV/IM), administration protocols, and use of adjunct analgesia. There is a lack of high quality data regarding the use of LDK as an analgesic agent in the ED. However, the current moderate quality data demonstrates a significant analgesic effect of LDK with occasional need for rescue analgesia and neuropsychological adverse events. Commonly reported neuropsychological adverse events included dizziness, dysphoria, and confusion, rarely agitation or hallucinations. All adverse events were self-limited or occasionally required benzodiazepines for resolution. **Conclusion:** Our GRADE evidence table identified moderate quality evidence from six RCTs supporting the analgesic effect of LDK for acute pain management in the ED when compared to using opioids alone.
Keywords: pain, low-dose ketamine

LO049

Ibuprofen or oxycodone? An observational cohort study of post-emergency department discharge management of children's fracture pain

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Introduction: Pediatric fracture pain is under-treated both in the emergency department (ED) and after discharge. Oral opioids and ibuprofen are amongst the top medications used to treat this pain. This study describes the post ED discharge effectiveness and safety of ibuprofen and oxycodone. **Methods:** A prospective cohort observational study was conducted at the Stollery Children's Hospital (Edmonton, Alberta) from June 2010 to July 2014. Children aged 4-16 years, with an acute fracture, who were being discharged home with *either* ibuprofen (Ibu) or oxycodone (Oxy) for pain management were eligible for recruitment. Patients were contacted daily for three days, and at 2 and 6 weeks post-injury. Information regarding medication use, pain levels (with the Faces Pain Scale, Revised), adjuvant therapies, adverse events, and side effects and follow up was collected. **Results:** A total of 329 children (n = 112 Oxy, n = 217 Ibu) were included. Mean age was 10.4 years (Ibu), and 12.3 years (Oxy); 68% (n = 223) were male. Fracture types included forearm/wrist (47%,n = 154), lower leg/ankle (14%,n = 46), shoulder/clavicle (13%,n = 42), and upper arm/elbow (12%,n = 39). Reductions were performed in 34% of cases (n = 113), while 9% (n = 29) had buckle fractures. Children receiving Oxy had their eating, sleeping, play, and school attendance affected more than those receiving Ibu. More children receiving Oxy (81%, 91/112) experienced an adverse effect than those receiving Ibu (61%, 129/213) (p = 0.0002); abdominal pain, dizziness, drowsiness, nausea, and vomiting were most prominent. The change in pain score (maximum pain - post-treatment pain) for Day 1 was 3.79 for Oxy and 3.61 Ibu; Day 2 was 3.68 Oxy and 3.55 Ibu; Day 3 was 3.34 Oxy and 3.66 Ibu. On Day 1, 59% (66/112) of Oxy cohort patients used other medication(s) for their pain treatment; 19% (41/213) did the same in the Ibu cohort. **Conclusion:** Ibuprofen and oxycodone provide similar pain relief for children with post-Ed discharge fracture pain. Oxycodone has greater impact on activities of daily living, side effects, and use of other medications to relieve pain. Oxycodone does not appear to confer any benefit over ibuprofen for pain relief, and given its negative side effect profile, this study suggests that ibuprofen is the better option. Further research is needed to determine the best combination treatment for fracture pain for children.
Keywords: opioid, pain, pediatric

LO050

The predictive value of pre-endoscopic risk scores to predict adverse outcomes among emergency department patients with upper gastrointestinal bleeding - a systematic review

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Introduction: Patients with upper gastrointestinal bleeding (UGIB) are at risk for serious adverse events (SAE) after emergency department (ED) discharge. Endoscopy can aid in risk stratification but is not easily available. Therefore, stratifying using pre-endoscopic risk scores can aid ED physicians in disposition decisions. The aim of this study was to conduct a systematic review to assess the predictive value of pre-endoscopic risk scores for risk-stratification of ED UGIB patients. **Methods:** We searched 4 databases from inception to March 2015 with search terms related to "UGIB" and "ED". Inclusion criteria were: 1) adult UGIB patients presenting to the ED; 2) risk scores without endoscopic predictors developed and validated in variceal and non-variceal UGIB patients. We excluded case reports, reviews, abstracts, animal studies and commentaries. In 2 phases (screening and full-review), 2 reviewers independently screened articles for inclusion. SAE included 30-day death, recurrent bleeding and need for intervention. Two reviewers independently extracted patient level data and the consensus data was used for analysis. We report kappa for the article selection, and pooled sensitivity, specificity, positive and negative predictive value, positive and negative likelihood ratios and accuracy with 95% CI for the risk scores. **Results:** We identified 3,173 articles, of which 3,065 were excluded in phase I (kappa 0.88, 95% CI 0.83-0.93). In phase II, we included 16 of the 108 remaining articles (kappa 0.84, 95% CI 0.70-0.97); 3 studied Glasgow Blatchford Score (GBS), 1 clinical Rockall score (cRockall) and 2 AIMS65; 6 compared GBS and cRockall, 3 compared GBS, a modification of the GBS and cRockall and 1 compared the GBS and AIMS65. Overall, the accuracy of the GBS, cRockall and AIMS65 was 0.47 (95% CI 0.46-0.47), 0.47 (95% CI 0.46-0.49) and 0.62 (95% CI 0.61-0.62), respectively. The accuracy for the GBS with a cut-off score of 2 was 0.73 (95% CI 0.71-0.74). **Conclusion:** None of the risk scores identified by our systematic review were robust and hence, cannot be recommended for use in clinical practice. However, the GBS with a cut-off score of 2 was superior over other risk scores. Future prospective studies are needed to develop robust new scores for use in ED patients with UGIB.
Keywords: upper gastrointestinal bleeding, risk stratification, emergency department

LO051

Validation of a clinical decision rule to detect patients with adverse drug events in the emergency department

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Introduction: Adverse drug events (ADE) are a leading cause of emergency department (ED) visits, yet are missed in up to 50% of presentations. In 2014, Accreditation Canada, a not-for-profit

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organization that evaluates healthcare institutions based on quality of care, introduced a requirement for EDs to identify patients at high-risk for drug-related morbidity, so that medication management interventions can be targeted to high-risk groups. We derived a clinical decision rule to identify patients at high-risk for ADEs using 4 variables. Our objective was to validate the rule by determining its sensitivity and specificity in a new sample. **Methods:** We conducted a prospective observational study in two tertiary care and one urban community hospital in British Columbia and Ontario. We used a systematic selection algorithm to generate a representative sample, and enrolled adults who reported taking at least one medication during the prior two weeks. Nurses completed the clinical decision rule and evaluated patients for standardized clinical findings. Each patient was assessed by a research pharmacist and a physician who were blinded to data collected by nurses. Any disagreement was subsequently adjudicated by an independent committee. The primary outcome was an ADE, defined as an unintended and harmful event related to medication use resulting a change in medical management, hospital admission or causing death. We calculated the rule's sensitivity, specificity, and the proportion of patients screening positive with 95% confidence intervals (CI). **Results:** Among 1529 enrolled patients, 196 (12.8%, 95% CI 11.2-14.6%) were deemed to have experienced an ADE. The rule, consisting of the variables (i) having a pre-existing medical condition or having taken antibiotics within one week, and (ii) age $\geq$ 80 or having a medication change within 28 days, had a sensitivity of 92.9% (95%CI 88.3%-96.0%) and a specificity of 35.0% (95%CI 32.5%-37.7%) for ADEs. The proportion of patients screening positive was 41.7%. **Conclusion:** Among adults presenting to EDs, the rule was sensitive for ADEs while maintaining reasonable specificity. If implemented, the rule may help identify those patients at high-risk for ADEs who may benefit from evaluation by a clinical pharmacist in the ED, and will help institutions meet current Accreditation Canada standards.

Keywords: adverse drug event, patient safety, clinical decision rule

LO052

Sticks and stones may break your bones, but does having a car crash in a rural location affect your access to EMS care and surgical intervention? The initial analysis of a unique EMS and Trauma Dataset

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Introduction: In Canada, major trauma is a healthcare priority and in 2014 was responsible for over 15866 deaths, with a total economic burden of 26.8 billion dollars. Numerous factors influence the likelihood of occurrence and outcome from major trauma, including incident factors, host, EMS response, emergency, surgical and critical care. Traditionally trauma registers contained information that mainly concerning hospital treatment and host factors. This collaborative analysis uses matched data from a Provincial Trauma Research Register and records from a Provincial Ambulance Service. **Methods:** A retrospective observational (registry) study comparing rural and urban adult and pediatric major trauma patients (Injury Severity Score >15) who were injured in a motor vehicle crash (ICD V20-V99) and presented to a level 1 or level 2 trauma centre by EMS by primary or secondary transfer, between April 2011 and March 2013 in a selected province in Canada. Comparisons of the process care times, and patient disposition, were made in an inclusive trauma system. **Results:** 108 cases meet the inclusion criteria with 78 considered rural and 30 urban using published definitions. The median response times were 16.2 minutes for rural *(95% CI: 13.2 -19.8) and 7.8 minutes for urban (95% CI: 7.2 - 10.5) with 60% and 61% meeting response targets respectively*. A greater proportion of urban patients are taken initially to level 3-5 centers and require secondary transfer (45% urban vs 24% rural $p = < 0.01$). Median times intervals to surgical care were double for the urban patients (14 rural vs 32 hrs urban $p = < 0.01$). **Conclusion:** The majority of serious road traffic collisions occur in rural areas. Although rural patients wait longer for an initial EMS response, more rural patients are taken directly to a level 1 or 2 trauma center. Unexpectedly then rural patients have much shorter times to surgical care. The benefits of an inclusive trauma system should be weighed against the benefits of bypass processes in urban environments where the nearest Emergency Department is not a Level 1 or 2 Trauma Center.

Keywords: trauma, emergency medical services (EMS), rural

LO053

Follow-up head CT scan after mild traumatic brain injury: is it really necessary?

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Introduction: Injured seniors visits are on the rise in the emergency department (ED) and up to 30 % are traumatic brain injury (TBI). Many patients suffer from comorbidities that require the use of anticoagulant drugs. The use of these drugs usually modify the trajectory patients will undergo in the ED. In the last decade, some authors suggested a systematic follow-up CT head scan 8 hours after the initial, while others didn't see the need to scan, referring only to the clinical features. We sought to evaluate the presence of delayed intracranial bleeding, evolution and investigation at the ED of elderly patients presenting for a mild TBI, with or without anticoagulotherapy. **Methods:** A retrospective cohort was built with hospital administrative clinical data for year 2014 at a Canadian Level 1 trauma center. Patients 65 years and older with traumatic brain injury and residing in the trauma center catching area were included. Data were extracted from medical files using a standardized collection tool in a consecutive pattern. Patients were classified in three groups: use of anticoagulant drug, use of antiplatelet drug and no anticoagulotherapy. Clinico-administrative data, intervention delay, investigations, comorbidities, medication and physiological status were collected. Intra and extra-hospital data were collected for a period of 90 days and the use of imaging and trajectories were analysed. Univariate and multivariate analysis were conducted. **Results:** 93 of the 189 TBI injury were mild TBI. The 93 patients were divided in patients using anticoagulotherapy (n = 9, 10 %), using antiplatelet drug (n = 58, 62.4 %) and no use of drug (n = 29, 31.2 %). Each group respectively undergo an initial head CT scan in a proportion of 88.9 %, 93 % and 76 %. Follow-up head CT scan were seen in 43 %, 16 % and 10 %. Delayed intra-cranial hemorrhage were identified in respectively 0 %, 2 % and 0 %. **Conclusion:** With the increase in patients presenting at Canadian ED for head trauma, our study suggests that anticoagulated elderly patients suffering from a mild traumatic brain injury do not systematically require a follow up CT head scan or longer observation time at the ED. A future clinical decision rule to determine the need of follow-up CT could be of benefit to emergency physicians.

Keywords: minor head injury, elderly, anticoagulant

LO054

The emergency department usage and utility of ISAR and CAM assessment tools in identifying hip fracture patients at risk for developing delirium

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