Emergency Medicine (ACEM) drafted a checklist incorporating PoCUS into the ACLS algorithm. This was further developed using the input of 24 international experts associated with five professional organizations led by the International Federation of Emergency Medicine. A modified Delphi tool was developed to reach an international consensus on how to integrate ultrasound into cardiac arrest algorithms for emergency department patients. **Results:** Consensus was reached following 3 rounds. The agreed protocol focuses on the timing of PoCUS as well as the specific clinical questions. **Core** cardiac windows performed during the rhythm check pause in chest compressions are the sub-xiphoid and parasternal cardiac views. Either view should be used to detect pericardial *fluid*, as well as examining ventricular *form* (e.g. right heart strain) and *function*, (e.g. asystole versus organized cardiac activity). **Supplementary** views include lung views (for absent lung sliding in pneumothorax and for pleural fluid), and IVC views for *filling*. **Additional** ultrasound applications are for endotracheal tube confirmation, proximal leg veins for DVT, or for sources of blood loss (AAA, peritoneal/pelvic fluid). **Conclusion:** The authors hope that this process will lead to a consensus-based *SHoC-cardiac arrest* guideline on incorporating PoCUS into the ACLS algorithm.

Keywords: point-of-care ultrasound (PoCUS), cardiac arrest, consensus

LO046

Factors associated with hospital admission following asthma exacerbations: a systematic review

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Introduction: Patients with asthma frequently present to the emergency department (ED) with exacerbations; however, a select number of patients require admission to hospital. The objective of this study was to summarize the evidence regarding asthma-related hospital admissions and factors associated with these admissions following ED presentation. **Methods:** Comprehensive literature searches were conducted in seven electronic databases (database inception to 2015); manual and grey literature searches were also performed. Studies reporting disposition for adults after ED presentation were included. Study quality was assessed using the Newcastle-Ottawa Scale (NOS); standardized data-collection forms were used for data extraction. Admission proportions and factors associated with admission at a statistical significance level ($p < 0.05$) were reported. **Results:** Out of an initial 5865 identified articles, 37 articles met full inclusion criteria. Admission proportions were reported in 25/37 studies, ranged from 1% to 37%, and collectively demonstrated a decline of ~9% in admissions between 1993 and 2012. Studies including a >50% Caucasian ethnicity were found to have a median admission proportion of 13% (interquartile range [IQR] = 7, 20) versus studies with >50% non-Caucasian ethnicity at 22% (IQR = 20, 28). Age, female sex, and previous hospitalizations for asthma exacerbation were the most individually identifiable factors associated with admission. Presenting features and medication profile were the most frequent domains associated with admission. **Conclusion:** Admission rates have decreased approximately 9% in a nearly 20-year span and seem to be higher in studies involving mostly non-Caucasian ethnic groups. Demographic factors, markers of severity obtained by history or at ED presentation, and medication profile could be assessed by ED clinicians to effectively discern patients at high risk for admission.

Keywords: asthma, admissions, knowledge synthesis

LO047

Predictors of treatment failure in renal colic patients discharged from the emergency department

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Introduction: Most patients with acute renal colic are discharged from the ED after initial diagnosis and symptom control, but 20-30% require repeat ED visits for ongoing pain, and 15-25% require rescue intervention (ureteroscopic intervention or lithotripsy). If patients destined for failure of outpatient management could be identified based on information available during their ED visits, they could be prioritized early for intervention to reduce short term pain and disability. Our objective was to identify predictors of outpatient treatment failure, defined as the need for hospitalization or rescue intervention within 60 days of ED discharge. **Methods:** We collated prospectively gathered administrative data from all Calgary region patients with an ED diagnosis of renal colic over a one-year period. Demographics, arrival mode, triage category, vital signs, pain scores, analgesic use and ED disposition were recorded. Research assistants reviewed imaging reports and documented stone characteristics. These data were linked with regional hospital databases to identify ED revisits, hospital admissions, and surgical procedures. The primary outcome was hospitalization or rescue intervention within 60 days of ED discharge. **Results:** Of 3104 patients with first ED visit for acute renal colic, 1296 had CT or US imaging and were discharged without intervention. Median age was 50 years and 69% were male. 325 patients (25.1%) required an ED re-visit and 11.8% required admission or rescue intervention. Patients with small (<5mm), medium (5-7mm) and large (>7mm) stones failed in 9.0%, 14.4% and 9.9% of cases respectively. The only factor predictive of treatment failure in multivariable models was stone position in the proximal or mid-ureter. Age, sex, vital signs, pain score, WBC, creatinine, history of prior stone or intervention, stone side, stone size, presence of stranding and degree of hydronephrosis were not associated with outpatient failure. **Conclusion:** Outpatient treatment failure could not be predicted based on any of the predictors studied.

Keywords: renal colic, treatment failure, pain management

LO048

Systematic review of the use of low-dose ketamine for analgesia in the emergency department

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Introduction: Ketamine is a popular sedative agent for painful procedures. It is not widely used at sub-dissociative analgesic doses in the emergency department (ED). We sought to determine the performance of low-dose ketamine (LDK) as an analgesic for acute pain management in adult patients in the ED. **Methods:** We systematically reviewed electronic databases (MEDLINE, EMBASE, AMED, CINAHL, PubMed and Cochrane database of systematic reviews), grey literature, conference proceedings and clinical trials registries. Two independent reviewers identified eligible studies using pre-determined criteria. We included peer-reviewed studies that used LDK (< 1 mg/kg IV or < 2mg/kg IM) in adult patients (>18 yo) requiring acute pain management for any condition in the ED. Our outcome measures included analgesic effect of LDK compared to any opioids, need for rescue analgesia, and neuropsychological adverse events. We assessed inter-rater agreement using kappa statistics, risk of bias using the Cochrane Collaboration's Tool, and propose a treatment recommendation using GRADE. Heterogeneity among studies precluded meta-analysis.

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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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