

pptv.com and tudou.com were searched using simplified Chinese. Inclusion criteria required that the subject in the video be completely visible five seconds prior to the event and at least ten seconds after and the quality of the video be adequate to visualize movement. Exclusion criteria included trauma or precipitating event (substance misuse, toxic exposure or asphyxiation). Each video source was searched until 30 consecutive irrelevant videos were obtained. **Results:** Four hundred and eighty eight videos met inclusion criteria. Of those videos, 112 could be confirmed as a "cardiac arrest" by at least two sources (news, or family social media account). In 53 (47%) of these videos the person touches their face or head within five seconds of collapse. Of the 98 videos where the person is upright, in 41 (37%) instances they hip-flex and with their hands on their upper legs prior to collapse. This pattern of behaviour is combined in 36 (32%) instances. After collapse, 68 (61%) appeared to exhibit extension posturing activity. Agonal breathing was visible in 39 instances (35%). **Conclusion:** Sudden out of hospital cardiac arrest has a recognizable pattern. This represents an opportunity for machine learning, using shape tracking and edge detection, to recognize this event and activate the emergency response system.

Keywords: cardiac arrest, prehospital care, machine learning

P032

Twelve angry medics: a study of bimanual external aortic compression in healthy adult men

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Introduction: Following life-threatening hemorrhage the goal is to temporize blood-loss and expedite definitive-rescue. Junctional (abdominal-pelvic) trauma, between the inguinal ligament and umbilicus; is a leading cause of potentially survivable mortality. Numerous devices such as junctional tourniquets and resuscitative endovascular balloon occlusion of the aorta have been suggested for this injury pattern, but we propose an immediately available and expedient bimanual maneuver that may act as a bridge to device application, proximal external aortic compression (PEAC). Of note, external aortic compression has been used for centuries in life-threatening postpartum hemorrhage. **Methods:** Twelve paramedic volunteers were recruited from a continuing education event. Participant demographics, blood pressure, abdominal circumference, body mass index and procedural discomfort were recorded. In pairs, six participants were taught PEAC and performed the maneuver, then exchanged roles. Training consisted of researcher led demonstration and participant return demonstration with feedback. The duration of training was less than five minutes for all participants. Femoral artery hemostasis was measured by doppler ultrasound. **Results:** Participant mean age was 28.6 (range 22 to 46) and their mean systolic blood pressure was 128.25 mmHg (range 102 to 145). Mean body mass index was 24 (range 22 to 28) and abdominal girth was 80 cm (range 70 to 110). Bilateral common femoral artery blood flow became undetectable in all participants, by doppler ultrasound. Participant discomfort was reported as a mean of 4.4 (range 3 to 6) on a zero to ten scale. No complications were reported with seven and 30 days follow-up. **Conclusion:** This study demonstrates successful PEAC in twelve healthy participants. However, our limitations include a small sample and the relatively modest abdominal circumferences of our participants. If light of these limitations, PEAC may be a potentially life-saving maneuver which is immediately deployable and easy to learn, for patient temporization until device application and/or operative rescue.

Keywords: trauma, hemorrhage, prehospital care

P033

Reducing pantoprazole infusions in ED GI bleed patients by optimizing electronic order sets

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Introduction: Non-variceal upper gastrointestinal bleeding (NVUGIB) is a common presentation to the emergency department (ED) accounting for significant morbidity, mortality and health care resource usage. In Alberta, a provincial care pathway was recently developed to provide an evidence informed approach to managing patients with an UGIBs in the ED. Pantoprazole infusions are a commonly used treatment despite evidence that suggests they are generally not indicated prior to endoscopy in the ED. The goal of this project was to optimize management of patients with a NVUGIB, in particular reduce pre-endoscopy pantoprazole infusions. **Methods:** In July 2016, we implemented a multi-faceted intervention to optimize management of ED patients with NVUGIB including 1) de-emphasizing IV pantoprazole infusions in the ED, 2) clinical decision support (CDS) embedded (for endoscopy, disposition and transfusions) within the order set and 3) educating clinicians about the care pathway. We used a pre/post-order set design, analyzing 391 days pre and 189 days post-order set changes. Data was extracted from our fully integrated electronic health records system. The primary outcome was the % of patients receiving IV pantoprazole infusion ordered by an emergency physician (EP) among all patients with NVUGIB. Secondary outcomes included % transfused with hgb >70g/L and whether using the GIB order set impacted management of NVUGIB patients. **Results:** In the 391 days pre-order set changes, there were 2165 patients included and in the 189 days post-order set changes, there were 901 patients. For baseline characteristics, patients in the post-order set change group were significantly older (64.4 yrs vs. 60.9 yrs, p-value=0.0016) and had a lower hgb (115 vs. 118, p-value=0.049) but otherwise for gender, measures of severity of illness (systolic blood pressure, heart rate, CTAS, % admitted) there were no significant differences. For the primary outcome, in the pre-order set phase, 47.1% received a pantoprazole infusion ordered by an EP, compared to 31.5% in the post-order phase, for an absolute reduction of 15.6% (p-value ≤ 0.001). For the secondary outcomes, transfusion rates were similar pre/post (22.08% vs. 22.75%). Significant inter-site variability exists with respect to the reduction in pantoprazole infusion rates across the four sites (-23.3% to +6.12%). **Conclusion:** Our interventions resulted in a significant overall reduction in pantoprazole infusions in ED patients with NVUGIB. Reductions in pantoprazole infusions varied significantly across the different sites, future work in our department will explore and address this variability. Keys to the success of this project included engaging clinicians as well as leveraging the SCM order sets as well as the provincial care pathway. Although there were no changes in transfusion rates, it is unclear if this a function of the CDS not being effective or whether these transfusions were clinically indicated.

Keywords: quality improvement and patient safety, gastrointestinal bleeding, order sets

P034

Audit and feedback for emergency physicians - perceptions and opportunities for optimization

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Introduction: There is a growing interest in providing clinicians with performance reports via audit and feedback (A&F). Despite significant

evidence exists to support A&F as a tool for self-reflection and identifying unperceived learning needs, there are many questions that remain such as the optimal content of the A&F reports, the method of dissemination for emergency physicians (EP) and the perceived benefit. The goal of the project was to 1) evaluate EP perceptions regarding satisfaction with A&F reports and its' ability to stimulate physicians to identify opportunities for practice change and 2) identify areas for optimization of the A&F reports. **Methods:** EP practicing at any of the four adult hospital sites in Calgary were eligible. We conducted a web survey using a modified Dillman technique eliciting EP perspectives regarding satisfaction, usefulness and suggestions for improvement regarding the A&F reports. Quantitative data were analyzed descriptively and free-text were subjected to thematic analysis. **Results:** From 2015 onwards, EP could access their clinical performance data via an online dashboard. Despite the online reports being available, few physicians reviewed their reports stating access and perceived lack of utility as a barrier. In October 2016, we began disseminating static performance reports to all EP containing a subset of 10 clinical and operational performance metrics via encrypted e-mail. These static reports provided clinician with their performance with peer comparator data (anonymized), rationale and evidence for A&F, information on how to use the report and how to obtain continuing medical education credits for reviewing the report. **Conclusion:** Of 177 EP in Calgary, we received 49 completed surveys (response rate 28%). 86% of the respondents were very/satisfied with the report. 88% of EP stated they would take action based on the report including self-reflection (91%) and modifying specific aspects of their practice (63%). Respondents indicated that by receiving static reports, 77% were equally or more likely to visit the online version of the eA&F tool. The vast majority of EP felt that receiving the A&F reports on a semi-annual basis was preferred. Three improvements were made to the eA&F based on survey results: 1) addition of trend over time data, 2) new clinical metrics, and 3) optimization of report layout. We also initiated a separate, real-time 72-hour bounceback electronic notification system based on the feedback. EP value the dissemination of clinical performance indicators both in static report and dashboard format. Eliciting feedback from clinicians allows iterative optimization of eA&F. Based on these results, we plan to continue to provide physicians with A&F reports on a semi-annual basis. **Keywords:** audit and feedback, self-reflection, performance metrics

P035

Continuous intravenous low-dose ketamine infusion for managing pain in the emergency department

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Introduction: To describe dosing, duration, and pre- and post-infusion analgesic administration of continuous intravenous sub-dissociative dose ketamine (SDK) infusion for managing a variety of painful conditions in the emergency department (ED). **Methods:** Retrospective chart review of patients aged 18 and older presenting to the ED with acute and chronic painful conditions who received continuous SDK infusion in the ED for a period over 6 years (2010-2016). Primary data analyses included dosing and duration of infusion, rates of pre- and post-infusion analgesic administration, and final diagnoses. Secondary data included pre- and post-infusion pain scores and rates of side effects. **Results:** 104 patients were enrolled in the study. Average dosing of ketamine infusion was 11.26 mg/hr, the mean duration of infusion was 135.87 minutes with 38% increase in patients not requiring post-infusion analgesia. The average decrease in pain score was 5.04. There were 12 reported adverse effects with nausea being the most prevalent.

Conclusion: Continuous intravenous SDK infusion has a role in controlling pain of various etiologies in the ED with a potential to reduce need for co-analgesics or rescue analgesic administration. There is a need for more robust, prospective, randomized trials that will further evaluate the analgesic efficacy and safety of this modality across wide range of pain syndromes and different age groups in the ED.

Keywords: ketamine, analgesia, emergency department

P036

Interim analysis of the impact of the emergency department transformation system on flow metrics

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Introduction: Emergency Department Systems Transformation (EDST) is a bundle of Toyota Production System based interventions implemented in two Canadian tertiary care Emergency Departments (ED) between June 2014 to July 2016. The goals were to improve patient care by increasing value and reducing waste. Longer times to physician initial assessment (PIA), ED length of stays (LOS) and times to inpatient beds are associated with increased patient morbidity and potentially mortality. Some of the 17 primary interventions included computerized physician order entry optimization, staff schedule realignment, physician scorecards and a novel initial assessment process ED access block has limited full implementation of EDST. An interim analysis was conducted to assess impact of interventions implemented to date on flow metrics. **Methods:** Daily ED visit volumes, boarding at 7am, time to PIA and LOS for non-admitted patients were collected from April 2014-June 2016. Volume and boarding were compared from first to last quarter using an independent samples median test. Linear regression for each variable versus time was conducted to determine unadjusted relationships. PIA, LOS for non-admitted low acuity (Canadian Triage and Acuity Scale (CTAS) 4,5) and non-admitted high acuity (CTAS 1,2,3) patients were subsequently adjusted for volume and/or boarding to control for these variables using a non-parametric correlation. **Results:** Overall, median ED boarding decreased at University Hospital (UH) (14.0 vs. 6.0, $p < 0.01$) and increased at Victoria Hospital (VH) (17.0 vs. 21.0, $p < 0.01$) from first to last quarter. Median ED volume increased significantly at UH from first to last quarter (129.0 vs. 142.0, $p < 0.01$) but remained essentially unchanged at VH. 90th percentile LOS for non-admitted low acuity patients significantly decreased at UH (adjusted $rs = -0.24$, $p < 0.01$) but did not significantly change at VH. For high acuity patients 90th percentile LOS significantly decreased at both hospitals (UH: adjusted $rs = -0.23$, $p < 0.01$; VH: adjusted $rs = -0.21$, $p < 0.01$). 90th percentile time to PIA improved slightly but significantly in both EDs (UH: adjusted $rs = -0.10$, $p < 0.01$; VH: adjusted $rs = -0.18$, $p < 0.01$). **Conclusion:** Persistent ED boarding impacted the ability to fully implement the EDST model of care. Partial EDST implementation has resulted in improvement in PIA at both LHSC EDs. At UH where ED boarding decreased, LOS metrics improved significantly even after controlling for boarding.

Keywords: emergency department systems transformation, quality improvement, overcrowding

P037

Training first-responders to administer publicly available epinephrine – a randomized study

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