

LO08

Effect of an intact “chain of survival” sequence on survival to discharge from out-of-hospital cardiac arrest

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Introduction: The “chain of survival” is a 5-link theoretical construct that has been central to cardiac arrest resuscitation for over 40 years. Although the role of each link has been extensively studied, little is known about the impact of performing the chain of survival in sequence. The purpose of this study was to estimate the proportion of out-of-hospital cardiac arrest (OHCA) responses by Emergency Medical Services (EMS) that had an intact chain of survival sequence response, and the effect of this on survival to hospital discharge. **Methods:** We conducted a prospective cohort study of adult (>age 20 years) OHCA patients using data collected between 2005-2007 by the Resuscitation Outcomes Consortium (ROC). ROC is a research network involving 10 research sites and 264 EMS agencies across North America. Using routinely collected data, we coded cases as receiving an intact or non-intact chain of survival sequence based on EMS cardio pulmonary resuscitation (CPR), rhythm analysis or defibrillation, epinephrine administration or endotracheal intubation, and transport to a hospital with an electrophysiology lab or percutaneous coronary intervention capability, contingent on the patient’s condition when EMS arrived. Multiple variable logistic regression was performed, adjusting for known (Utstein) survival predictors, to estimate the independent effect of intact chain of survival sequence on survival to hospital discharge. REB approval was obtained. **Results:** We enrolled 12,821 OHCA cases, of which, 29.4% (n = 3,773) had an intact chain of survival and 7.6% (n = 972) survived to hospital discharge. Cases with an intact chain of survival were younger, and more likely to arrest in public, receive bystander CPR, occur in the USA and specific ROC sites, and had faster EMS response times. The adjusted odds ratio of survival to hospital discharge with an intact chain of survival sequence was 2.4 (95% CI: 2.1-2.8). A sensitivity analysis of 4,056 cases with known timing of endotracheal intubation found a similar adjusted odds ratio of 2.1 (95% CI: 1.6-2.8). **Conclusion:** Our results indicate that OHCA resuscitation with an intact chain of survival occurs in approximately 1/3 of cases, and results in over a two-fold increase in the odds of surviving to hospital discharge. Initiatives to improve EMS teamwork and increase the proportion of OHCA resuscitation with an intact chain of survival appear to be warranted.

Keywords: cardiac arrest, resuscitation, system design

LO09

Assessing the ability of emergency department patients to self-triage by using an electronic questionnaire: a pilot study

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Introduction: The process of triage is used to prioritize the care of patients arriving in the emergency department (ED). To our knowledge, self-triage has not been previously studied in the general emergency department (ED) setting. In an attempt to test the feasibility of implementing this in the ED, we sought to assess the ability of ED patients to triage themselves using an electronic questionnaire. **Methods:** This was a prospective observational study. An iPad-based questionnaire was designed with a series of ‘yes’ or ‘no’ answers related to common chief complaints. A score corresponding to a Canadian Triage and Acuity Scale (CTAS) category was assigned based on their answers, without

the knowledge of patients or ED staff. These scores were subsequently compared to the official CTAS score assigned by triage nurses. A convenience sample of ambulatory patients arriving at the ED were enrolled over a four week period. Patients arriving by ambulance were excluded. We also sought to assess patients’ ability to predict their ultimate disposition. **Results:** A total of 492 patients were enrolled. The mean age of enrolled patients was 43.9. Of enrolled patients, 56 (11.4%) were under 20 years old, 168 (34.1%) between ages 20-39, 116 (23.6%) between ages 40-59 and 152 (30.9%) older than 60 years. We had 245 (49.8%) patients identify as male. Patient-determined CTAS scores were as follows: 146 CTAS 1 (26.7%), 66 CTAS 2 (13.4%), 176 CTAS 3 (35.8%) and 104 CTAS 4 and 5 (21.1%). Formal triage CTAS scores were: 47 CTAS 2 (9.6%), 155 CTAS 3 (31.5%), and 290 CTAS 4 and 5 (59%). With our survey tool, 22.2% of patients matched their official triage scores. We found that that 69.9% of participants over-estimated their CTAS score while 7.9% underestimated it. Two hundred and three patients (41.3%) felt that they needed to be admitted. In fact, 73 patients (17.3%) were admitted to hospital. **Conclusion:** Using an electronic questionnaire, ambulatory patients frequently overestimated the acuity of their presenting complaint. Patients were also not able to accurately predict their disposition. Further study of different approaches to self-triage is needed before possible implementation in EDs.

Keywords: triage, quality improvement, Canadian Triage and Acuity Scale

LO10

Quantity of opioid to prescribe for acute pain to limit misuse after emergency department discharge

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Introduction: A 2008 survey found that 1.9% of the entire US population was using prescription pain medication non-medically and that 56% obtained them from a friend or relatives. Diversion of pain medication may occur when a portion of the prescription is unused for pain relief after an ED visit. We hypothesized that at least 10 pills (~40%) of an opioid prescription 2 weeks after an ED visit will not be consumed and become available for potential misuse. **Objective:** Determine the quantity of unused opioid pills for common acute pain diagnoses, 2 weeks after an ED visit for acute pain. **Methods:** Prospective observational cohort study of consecutive ED patients from a tertiary academic urban hospital with 60,000 ED visits annually. Inclusion criteria: aged ≥ 18 years, acute pain conditions present ≤ 2 weeks, pain intensity at triage of ≥ 4 (on a 0-10 numeric rating scale; NRS), and discharged with a new opioid prescription. ED physicians identified (24/7) eligible patients. They recorded the pain complaint/location, the final diagnosis, the quantity and type of prescribed pain medication. Discharged patients completed paper or electronic 14-day diary (REDCap database) to document their pain medication consumption. As a mitigation strategy, they were also contacted by phone at 2 weeks for the same information. A paired t-test was used to test the difference between the amounts of opioids prescribed and consumed. **Results:** 350 patients were recruited. Mean age 50 (SD ± 16) and 54.2% were men. Painful diagnosis: fracture (18.2%), acute back pain (15.3%), renal colic (15.3%), Sprain (excluding back/neck pain) (6.9%), Contusion (6.4%), acute neck pain (5.8%), abdominal pain (4.9%), and other (27.2%). Opioids prescribed: oxycodone (47%), morphine (37%) and hydromorphone (16%). Means quantity of opioid pills prescribed: 24 (IC95%: 23-26). Filled opioid prescription: 92%. Means quantity of opioid pills consumed: 8 (IC95%: 7-9). Means quantity of unused opioid pills: 16. Opioid pills available

for misuse in our cohort: 5,600 pills. **Conclusion:** After an ED visit for acute pain a significant portion of opioids prescribed is unused and available for misuse. A large pragmatic study should be done to confirm that an opioid prescription strategy based on our results will limit unused opioid pills while maintaining pain relief.

Keywords: opioids

LO11

Opiate prescribing in Ontario emergency departments

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Introduction: Increased prescribing of high potency opioids has been associated with increasing opioid addiction and linked to serious adverse outcomes including misuse, diversion, overdose and death. Problems related to opioids are a major Canadian public health concern yet few data are available on prescribing in most Canadian provinces. The objective of this study was to describe opioid prescribing in Ontario EDs and patient harms associated with this practice. **Methods:** We conducted a population-based cohort study among Ontario residents aged 15-64 years who were eligible for public drug coverage between April 2008 and March 2012. Using administrative databases, we identified patients with no opioid use in the past 12 months who received a prescription opioid from an emergency or family physician. Patients were followed for 2 years following their index prescription. The primary outcome was hospital admission for opioid toxicity and secondary outcome was dose-escalation exceeding 200 mg morphine equivalents (MEQ). **Results:** Of the 77,270 unique patients included, 33,492 (43.3%) and 43,778 (56.7%) prescriptions were issued by emergency physician (EP) and family physicians (FP), respectively. FP patients were older (45.9 vs 41.2 yr, MSD 0.35), had fewer ED visits (0.9 vs 2.3, MSD 0.46), and more FP visits (11.5 vs 8.7 MSD 0.31) in the year prior to their index visit. For combination products, EPs were more likely to prescribe oxycodone compared to FPs (37.2% vs 16.7%, Δ 20.5, 95% CI: 19.9, 21.2). For single agent products, EPs were more likely to prescribe hydromorphone compared to FPs (44.5% vs 21.7%, Δ 22.8, 95% CI: 20.4, 25.2). FPs were more likely to prescribe codeine either as a combination or single agent formulation. EP prescriptions led to significantly more hospital admissions for opioid toxicity (0.5% vs 0.3%, Δ 0.2, 95% CI: 0.1, 0.3), while FP prescriptions more often resulted in dose escalation beyond 200 mg MEQs (0.1% vs 0.7%, Δ 0.6, 95% CI: 0.4, 0.7). **Conclusion:** A large percentage of opioid-naïve patients receive an initial opiate prescription in the ED, where the use of high potency opioids is much more common, with 1/200 of these patients subsequently hospitalized for opioid toxicity. Creation of a physician accessible provincial registry would be useful to monitor opioid prescribing and dispensing, inform clinical practice, and identify patients at high-risk who may benefit from early interventions.

Keywords: opioid, physician prescribing, toxicity

LO12

The utility of femoral nerve blocks in the emergency department; a national survey of practice

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Introduction: Approximately 30,000 hip fractures occur annually in Canada, and the incidence will increase with an aging population. Pain control remains a challenge with these patients, as many are elderly and prone to delirium. Regional anesthesia has shown to be very effective with minimal risks, but it is not clear how often emergency physicians

are using this technique to provide analgesia for patients with proximal hip fractures. This is the first Canada-wide survey to evaluate the use of regional anaesthesia in the emergency department for hip fractures. It also evaluates physician comfort level with performing these blocks, perceived educational needs in this area, and barriers to performing nerve blocks. **Methods:** A 13-question survey was sent to 1041 members of the Canadian Association of Emergency Physicians via email in January and February of 2016. Data was collected and analysed using an online collection program called "Survey Monkey". Ethics approval was obtained through the University of Manitoba Research Ethics Board. **Results:** 272 Emergency physicians and residents took part in the survey. The majority of respondents (75.9%) choose intravenous opioids as their first line of analgesia and only 7.6% use peripheral nerve blocks (PNB) as their first line choice for analgesia in hip fracture. In response to practitioner comfort with PNBs for hip fractures, most were not at all confident (45.0%) in their ability and many respondents have never performed a nerve block for a hip fracture (53.9%). The most commonly identified barriers to performing PNBs include lack of training, the time to perform the procedure and a lack of confidence. A larger percentage of respondents (34.2%), identified having had no training and no knowledge of how to perform PNBs for hip fractures. **Conclusion:** The vast majority of Canadian emergency physicians who took part in this survey do not utilize PNBs as a method of pain management for hip fractures. Over half have never performed one of these procedures and many have never received training in how to do so. Future efforts should focus on improving access to education, disseminating information regarding the effectiveness of PNB, and addressing logistical barriers in the ED.

Keywords: survey, regional anesthesia, emergency department

LO13

GridlockED: an emergency medicine game and teaching tool

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Introduction/Innovation Concept: In the controlled chaos of the emergency department (ED) it can be difficult for medical trainees similarly recognize that there is definite order to the chaos, and many may never truly appreciate its complexity. How should medical learners develop this skill? Didactic teaching cannot effectively portray the complexities of managing the ED. Much like education in cardiac arrest, trauma, and multi-casualty incident management, it is our belief that the management of patient flow through the ED is best learned through simulation. Thus, we developed GridlockED, a board game that requires players to work cooperatively to manage a simulated ED to win the game. **Methods:** GridlockED development took place over a six-month period during which iterative cycles of gameplay and redevelopment were used to optimize game mechanics and improve player engagement. The patient cases were created by medical students (PS, DT, JR) and subsequently reviewed for content validity by two attending emergency physicians (TC, AP). Input from attending emergency physicians, residents, medical students, and laypeople was integrated into the game through a Plan-Do-Study-Act (PDSA) model. **Curriculum, Tool, or Material:** Our game includes: 1) The game board; 2) Patient cards, which describe a patient, their level of acuity, and the tasks that must be completed in order to disposition the patient; 3) Event cards, which cause random positive or negative events to occur-much like random events occur in real life that change the dynamics of the ED; 4) Game Characters, which move around the board to denote where tasks are being completed; 5) A tracking sheet to follow how many tasks each character has performed in each turn; 6) A shift-time clock, which is