

Canadian ED patient safety quality indicator. International data exists although inconsistencies exist in the way URV are defined and measured. To our knowledge there are no published Canadian data on the percentage of ED URV admissions. This study examines our own URV data and in particular the correlation between URV admission rates and first visit Canadian Triage Acuity Scale (CTAS) category. **Methods:** A retrospective analysis of 12-month's data (January - December 2015) was completed for URV to the ED of a 445 bed regional tertiary care adult and pediatric teaching hospital with 57,000 annual attendances. URV was defined as any patient registering within 72 hours of an earlier visit that had resulted in a discharge from ED. Planned return visits were excluded. The data was analysed for an overall URV percentage, UV percentage by first visit CTAS category, overall percentage of URV admitted and URV admission percentage by first visit CTAS category. Pearson R correlation and Fishers Exact Test were used to test the relationship. **Results:** During the 12-month period there were 57,025 registrations of which 46,793 patients were discharged. There were 3566 URV (7.62% of those discharged); the number of URV admitted was 532 (1.14 % of those discharged). The return rate/admission rates by CTAS category were: CTAS 1: 6.74%/1.55%; CTAS 2: 7.86%/1.92%; CTAS 3: 8.54%/1.35%; CTAS 4: 5.99%/0.40%; CTAS 5: 5.55%/0.27%. The RR of admission on return for discharged CTAS groups 1 and 2, compared with CTAS 3, 4 and 5 was 1.90 (95 CI 1.57 to 2.30; $p < 0.0001$). Rate of admission on return was negatively correlated with initial CTAS level (Pearson $r = -0.89$ (95 CI -0.99 to -0.03); $R^2 = 0.79$; $F = 11.25$; $p = 0.04$). **Conclusion:** We have demonstrated a relationship between first visit CTAS category and the unplanned return admission rate. If admission is taken as a marker of illness severity, then the likelihood of an inappropriate discharge is inversely proportional to first visit CTAS score. While this makes sense intuitively, our data confirms this relationship in a Canadian tertiary care hospital and supports the reporting of ED URV admission data by first visit triage category as an important quality indicator.

Keywords: CTAS, unplanned return visits, admission rate

MP009

Reliability and interchangeability of measures of two tissue oximeters in healthy volunteers

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Introduction: Near-infrared spectroscopy (NIRS) is a non-invasive, continuous and painless method of monitoring oxygen saturation of hemoglobin in any given superficial tissue. Given that hemodynamic instability can affect the oxygen saturation, NIRS could prove to be an interesting tool in quantifying tissue oxygenation, consequently guiding clinical management. The aim of this study was to compare the reliability of two commonly used tissue oximeters, the INVOS 5100c from Covidien and the Equanox 7600 from Nonin. We postulated the Equanox (a more recent tissue oximeter) would have a better reliability than the INVOS. As a secondary outcome, we evaluated whether the measures given by the two oximeters were comparable. **Methods:** The study population was composed of healthy adult volunteers. Three measurements were taken at six different sites on both sides of the body in a randomized order. Two different sensors were used for each measure. From these measures, two intra-class correlations (ICC) - one inter-sensor and the other intra-sensor - were calculated for each device and compared using the Fisher's r-to-z transformation method. An additional inter-device ICC was also calculated. We considered ICCs over 0.75 as an indicator of good reliability, while ICCs under 0.40 were considered to represent poor reliability. The sample size was calculated

based on the calculation of a unidirectional confidence interval for a parametric ICC. Expecting a 0.75 ICC value, we concluded that 53 participants needed to be recruited in order to attain 80% power and a range of 0.1 towards the low values. **Results:** Fifty-three healthy volunteers (27 men and 26 women) with a mean age of 31 years (standard deviation 10) were recruited. We found no differences between the repeatability of the INVOS and the Equanox for both inter and intra-sensor reliability (ICC = 0.94 (95% confidence interval (CI) 0.86-0.97) versus ICC = 0.92 (95%CI 0.86-0.95), $p = 0.42$ and ICC = 0.94 (95%CI 0.89-0.96) versus ICC = 0.96 (95%CI 0.93-0.98), $p = 0.21$, respectively). However, when compared directly, we found that the readings produced by the two oximeters varied considerably (ICC 0.18 (95%CI -0.10 to 0.43). **Conclusion:** When taken individually, both tissue oximeters displayed good inter and intra-sensor reliability. However, they oximeters displayed poor inter-devices agreement, their readings varying considerably amongst each other.

Keywords: reliability, near-infrared spectroscopy, tissue oximetry

MP010

Wraparound care for youth injured by violence: a randomized control trial

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Introduction: Youth injured by violence is a major public health concern in Canada. It is the fourth leading cause of death in youth and the foremost reason youth visit an emergency department (ED). In Winnipeg, 20% of youth who visit an ED with an injury due to violence will have an ED visit for a subsequent violent injury within one year. Youth injured by violence are in a reflective and receptive state of mind, rendering the ED setting appropriate for intervention. **Methods:** We completed a randomized control trial in November 2015 comparing wraparound care for youth age 14 - 24 who were injured by violence to standard ED care. Youth were excluded if their injury was due to child maltreatment, sexual assault or self-harm. An adapted pre-consent randomization methodology was used. The intervention was developed using a community based participatory research approach. Wraparound care was delivered by a support worker with lived experience with violence. Support workers were on call 24/7 in order to start the intervention in the ED and take advantage of the "teachable moment." Care continued in the community for approximately one year. **Results:** A total of 133 youth were randomized (68 intervention, 65 control) in one year. There was no difference in age, gender, or severity of injury between the two groups. Patients randomized to the intervention spent a median of 30 minutes less in the ED than those receiving standard care ($p = 0.22$). Youth are safely housed, have enrolled in education opportunities, and are engaged in addictions care. Results of a chart review examining repeat visits to the ED for violent injury, substance use and mental health will be completed in Spring 2016 and will be presented. **Conclusion:** There were no differences between standard care and intervention groups on baseline characteristics reflecting effective randomization. The introduction of an intervention at bedside in the ED did not have a negative impact on patient length of stay.

Keywords: youth violence, intervention, randomized control trial

MP011

Using GRADE-based recommendations for analgesia and antiemetics in electronic order sets to influence physician behaviour towards best practice and cost-savings

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Introduction: The addition of computerized physician order entry (CPOE) to Emergency Departments in recent years has led to speculation over potential benefits and pitfalls. Recent studies have shown benefits to CPOE, though there lacks sufficient evidence on how it could change physician behaviour. Physician practices are known to be difficult to change, with getting evidence into daily practice being the main challenge of knowledge translation. Our study aims were to determine if well-designed electronic order sets for CPOE improved MD practices. **Methods:** The Calgary Zone Pain Management in the Emergency Department Working Group relied on a GRADE-based literature review for identifying best practices for analgesia and antiemetics, resulting in soft changes to the dedicated analgesia and antiemetic electronic order set noting working group preference, and emphasizing hydromorphone over morphine, as well as 4 mg ondansetron over 8 mg. The new electronic order set was started in the only Calgary Region order entry system on December 11th, 2014. Data was collected from July 2014 - May 2015. A Yates chi-squared analysis was completed on all orders in a category, as well as the subgroups of ED staff and residents, and orders placed using the new order set. **Results:** A total of 100460 orders were analyzed. The use of hydromorphone increased significantly across all 4 EDs. IV hydromorphone use increased (5.82% of all opioid orders up to 26.93%, $P < 0.0001$) with a reciprocal decline in IV morphine (67.81% of all opioid orders down to 46.56%, $P < 0.0001$). Similar effects were observed with ondansetron 4 mg IV orders increasing (1.37% of all ondansetron orders to 18.64%, $P < 0.0001$) with a decrease in 8 mg dosing (15.75% of all ondansetron orders to 7.23%, $P < 0.0001$). These results were replicated to a lesser degree in the non-ED staff and non-order set subgroups. Implementation of the new order set resulted in an increase of its use (37.64% of all opioid orders up to 49.29%, $P < 0.0001$). Finally, a cost-savings analysis was completed showing a projected annual savings of \$185,676.52 on medications alone. **Conclusion:** This data supports the manipulation of electronic order sets to help shape physician behaviour towards best practices. This provides another strong argument towards the benefits of CPOE, and can help maintain best practices in Emergency Medicine. **Keywords:** analgesia, electronic order sets, knowledge translation

MP012

Is there an association between the use of cardiac ultrasound and survival outcomes in patients arriving to the emergency department in cardiac arrest? The second Sonography in Hypotension and Cardiac Arrest in the Emergency Department (SHOC-ED 2) Study
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Introduction: The use of cardiac point of care ultrasound (PoCUS) to assess cardiac arrest patients is widespread, although not mandated by advanced cardiac life support (ACLS) guidelines. This study aims to examine if the use of ultrasound, along with the findings on ultrasound are associated with a difference in outcomes of cardiac arrest patients in the emergency department (ED). **Methods:** A retrospective database and chart analysis was completed for patients arriving to a tertiary ED in asystole or PEA cardiac arrest, between 2010 and 2014. Patients were excluded if aged under 19, or with a previous DNR order. Patients were grouped based on whether PoCUS was used during ACLS (PoCUS

group) and those without PoCUS (control group). Multiple data were abstracted from charts using a standardized form. Data was analyzed for the return of spontaneous circulation (ROSC), survival to hospital admission (SHA), and survival to hospital discharge (SHD), as well as initial cardiac activity findings on PoCUS. **Results:** 230 patients met the study inclusion criteria, with 44 (19%) in the control group, and 186 (81%) in the PoCUS group. In the PoCUS group 20 (11%) had cardiac activity (Positive PoCUS) and 166 (89%) had no cardiac activity recorded. The control group had a higher rate of SHA than the PoCUS group (27%; 95% CI 15-43% vs. 10%; 6-15%, $p = 0.0046$), however there was no difference in frequency of ROSC (control: 37%; 24-55% vs. PoCUS 26%; 20-33%, $p = 0.1373$) or SHD (control: 7%, 95% CI 1-19%; PoCUS: 2%, 95% CI 0-5%, $p = 0.0858$). Positive PoCUS patients had a higher frequency of ROSC (75%; 50-91% vs. 20%; 15-27%, $p < 0.001$) and SHA (25%; 9-49% vs. 8%; 4-13%, $p = 0.0294$) than patients with no PoCUS cardiac activity, however there was no difference in the rate of SHD between the positive PoCUS patients (0%; 0-17%) and patients with no PoCUS cardiac activity (2%; 0-5%, $p = 1.0000$). **Conclusion:** Our results suggest that there is no difference in survival between cardiac arrest patients receiving PoCUS and those who do not. Although finding positive cardiac activity on PoCUS is associated with greater ROSC and survival to hospital admission, it does not identify patients with a final outcome of survival to hospital discharge. **Keywords:** point-of-care ultrasound (PoCUS), cardiac arrest, survival

MP013

A portrait of rural pre-hospital services in the province of Québec
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Introduction: Rural emergency departments (EDs) are important safety nets for 20% of Canadian citizens. In Quebec, the province's 26 rural EDs treat an average of 19,000 patients/year and are on average 300 km from levels 1 and 2 trauma centers. These distances signify that Emergency Medical Services (EMS) play a considerable role in the care of rural patients. EMS in Quebec province are private local services. There are no published reports on EMS in rural Quebec. As part of a larger study on rural emergency care, this descriptive study aimed at offering a comprehensive portrait of EMS. **Methods:** We conducted semi-structured interviews with managers of all paramedic services in rural Quebec. Interview questions focused on number of transports, training, availability of telemetry, GPS technologies, and work schedules. **Results:** Fifty managers of the 51 private companies serving the 26 rural EDs in Quebec were interviewed (response rate 98%). All were primary care paramedics (PCP). In 2010, EMS transported 40,671 patients, with 10,228 emergency transports to the rural EDs. A total of 7956 inter-facility transfers were conducted, 1499 of them emergency. Each ED required between 88 and 700 inter-facility transfers. A total of 60% ($n = 31/51$) had GPS technology, only 25% ($n = 13/51$) had telemetry features. Work schedules varied with 13% ($n = 7/51$) of companies offering shifts of less than 12 hours, 28% ($n = 14/51$) 24/7 weekly shifts, and 56% ($n = 29/51$) a combination. **Conclusion:** This is the first study to describe rural EMS in Quebec. The finding that Quebec's rural EDs are served by 51 privately-owned companies is unique in Canada. The considerable number of EMS transports, including inter-facility transfers, may reflect lack of local resources in rural EDs, the vulnerable population served, or the increased trauma risk in rural areas. Future studies should examine inter-facility transport reasons, costs, times and adequate training/scope of EMS practice. **Keywords:** rural emergency departments, emergency medical services (EMS), transport