

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 anticoagulation. **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 anticoagulation. 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 anticoagulation (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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**Introduction:** Delirium is an acute state of mental confusion that is a frequent complication in older adults with a hip fracture, and is often unrecognized by clinicians in the emergency department (ED). It is associated with prolonged hospitalization, functional decline, hospital readmission, and death. The Identification of Seniors At Risk (ISAR) and Confusion Assessment Method (CAM) are two standardized tools designed to facilitate prompt screening and detection of functional decline and delirium respectively amongst adults 65 and older. The objective of this study was to determine the ED usage and utility of ISAR and CAM assessment tools in identifying hip fracture patients at risk for developing delirium. **Methods:** This was a retrospective chart review of patients aged 65 and older, presenting to an academic ED (annual census 60,000) with a discharge diagnosis of hip fracture from January 1<sup>st</sup> 2014 to July 31<sup>st</sup> 2015. At this institution, both the ISAR and CAM are included in the standard ED nursing documentation and are intended to be completed for all patients over 65 years of age. **Results:** Of the 243 hip fracture cases included in this study, the ISAR and CAM scores were completed for 131 (53.9%) and 69 (28.4%) patients, respectively. There were 43 (17.7%) cases of recorded in-hospital acute delirium. Of the delirium cases, 20 (46.5%) had an ISAR assessment. Patients with an ISAR score of  $\geq 3$  were more likely to experience delirium compared to those with lower ISAR scores (28.3% vs 8.3%;  $\Delta$  20.0%, 95% CI: 6.6%, 34.9%). Of the 43 patients with delirium, 11 (25.6%) had a CAM score recorded. Patients with a positive CAM score (meeting 3 of 4 criteria in the diagnostic algorithm) were more likely to experience delirium compared to those with negative CAM scores (66.7% vs 11.1%;  $\Delta$  55.6%, 95% CI: 17.5%, 79.9%). **Conclusion:** Vigilant efforts are needed to ensure these screening tools are applied for all patients over the age of 65 presenting to the ED to improve the recognition and early management of delirium. Future research should focus on initiatives to improve delirium screening compliance by ED personnel.

**Keywords:** hip fracture, delirium, screening tools

#### LO055

##### **Increased utilization of Bier block for pediatric forearm fracture reduction following simulation and web-based training**

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**Introduction:** Bier block (BB) regional intravenous anesthesia is a safe and effective alternative to procedural sedation for analgesia during forearm fracture reductions, yet BB remains infrequently utilized in the Pediatric Emergency Department (PED). No standardized methods of BB training have previously been described. The objectives of this study were to evaluate comfort and level of experience with BB in the PED, and to determine if a multimodal instructional course increases these from baseline and translates to increased utilization of this technique. **Methods:** A novel interdisciplinary simulation and web-based training course was developed to teach the use of BB for forearm fracture reduction at a tertiary PED. Participants were surveyed pre/post training, and at 2- and 6-months regarding their comfort with and willingness to use BB. In parallel, we prospectively assessed the clinical utilization of BB in the PED during the 24-month period immediately following course completion. **Results:** Course participation included 38 members of the PED (N = 26 physicians, 12 nurses), and survey response rate

was 100% at all time points. Respondents reported that course participation increased both their comfort (10% pre vs. 89% post-training,  $p < 0.001$ ) and willingness (51% pre vs. 95% post-training,  $p < 0.001$ ) to use BB for forearm fracture reduction, an effect that was sustained at 6-months following course completion (66% and 92%, respectively,  $p < 0.001$  for both). Before course attendance, only 6% of respondents indicated that they had ever used BB in a PED setting, and all participants indicated that the course addressed their learning objectives. In clinical practice, there were no BB performed prior to course administration. We observed a consistent and sustained increase in the clinical utilization of BB, with 39% of all PED forearm reductions performed using BB at 24-months post-course completion (114 BB, 17 unique physicians). **Conclusion:** A combined simulation and web-based training course increased comfort and willingness to use BB and was associated with increased utilization of this technique for forearm fracture reduction in the PED.

**Keywords:** intravenous regional anesthesia, procedural sedation

#### LO056

##### **Perceptions and provision of analgesia for acutely painful conditions in children: a multi-centre prospective survey of caregivers**

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**Introduction:** The suboptimal management of children's pain in the emergency department (ED) is well described. Although surveys of physicians show improvements in providing analgesia, institutional audits suggest otherwise. One reason may be patient refusal. Our objectives were to determine the proportion of caregivers that offered analgesia prior to arrival to the ED, accept analgesia in the ED, and identify reasons for withholding analgesia. Our results will inform knowledge translation initiatives to improve analgesic provision to children. **Methods:** A novel survey was designed to test the hypothesis that a large proportion of caregivers withhold and refuse analgesia. Over a 16-week period across two Canadian paediatric EDs, we surveyed caregivers of children aged 4-17 years with an acutely painful condition (headache, otalgia, sore throat, abdominal pain, or musculoskeletal injury). The primary outcome was the proportion of caregivers who offered analgesia up to 24 hours prior to ED arrival and accepted analgesia in the ED. **Results:** The response rate was 568/707 (80.3%). The majority of caregivers were female (426/568, 75%), aged 36 years or older (434/568, 76.4%), and had a post-secondary education (448/561, 79.9%). Their children included 320 males and 248 females with a mean age of 10.6 years. Most (514/564, 91.1%) reported being "able to tell when their child was in pain". On average, children rated their maximal pain at 7.4/10. A total of 382/561 (68.1%) caregivers did not offer any form of analgesia prior to arrival. Common reasons included lack of time (124/561, 22.1%), fear of masking signs and symptoms (74/561, 13.2%) or the seriousness of their child's condition (72/561, 12.8%), and lack of analgesia at home (71/561, 12.7%). Analgesia was offered to 328/560 (58.6%) children in the ED and 283/328 (72.6%) caregivers accepted. The most common reason for not accepting analgesia was child refusal (20/45, 44.4%). **Conclusion:** Most caregivers do not offer analgesia to their child prior to arriving in the ED despite high levels of pain and an awareness of it. Despite high rates of acceptance of analgesia in the ED, misconceptions are common.