

Health document entitled, "Setting Priorities for the Health Care System," the KGH Medical Staff Rules, and the B.C. Health Quality Matrix occurred. A summary presentation to the full ED on change management and leadership in residency occurred at completion.

**Conclusion:** This innovative leadership and administration elective was the culmination of a need to see more formal post graduate leadership training in residency. The rotation was based on the CanMEDS framework, particularly the "leader" competency, and was based on recent evidence regarding leadership and administration competencies in emergency medicine. We hope this serves as a potential model for other rotation based electives or core rotations that desire to blend leadership competencies with clinical emergency medicine.

**Keywords:** education, leadership, administration

#### P016

##### **Low risk ankle rule, high reward-a quality improvement initiative to reduce ankle x-rays in the pediatric emergency department**

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**Introduction:** Our tertiary care institution embarked on the Choosing Wisely campaign to reduce unnecessary testing, and selected the reduction of ankle x-rays as part of its top five priority initiatives. The Low Risk Ankle Rule (LRAR), an evidence-based decision rule, has been derived and validated to clinically evaluate ankle injuries which do not require radiography. The LRAR, is cost-effective, has 100% sensitivity for clinically important ankle injuries and reduces ankle imaging rates by 30-60% in both academic and community setting. Our objective was to significantly reduce the proportion of ankle x-rays ordered for acute ankle injuries presenting to our pediatric Emergency Department (ED). **Methods:** Medical records were reviewed for all patients presenting to our tertiary care pediatric ED (ages 3- 18 years) with an isolated acute ankle injury from Jan 1, 2016-Sept 30, 2016. Children with outside imaging, an injury that occurred >72 hours prior, or those who had a repeat ED visit for same injury were excluded. Quality improvement (QI) initiatives included multidisciplinary staff education about the LRAR, posters placed within the ED highlighting the LRAR, development of a new diagnostic imaging requisition for ankle x-rays requiring use of the LRAR and collaboration with the Division of Radiology to ensure compliance with new requisition. The proportion of patients presenting to the ED with acute ankle injuries who received x-rays was measured. ED length of stay (LOS), return visits to the ED and orthopedic referrals were collected as balancing measures. **Results:** At baseline 88% of patients with acute ankle injuries received x-rays. Following our multiple interventions, the proportion of x-rays decreased significantly to 54%, ( $p < 0.001$ ). This decrease in x-ray rate was not associated with an increase in ED LOS, ED return visits or orthopedic referrals. There was an increase uptake of the dedicated x-ray requisition over time to 71%. **Conclusion:** This QI initiative to increase uptake of the LRAR, resulted in a significant reduction of ankle x-rays rates for children presenting with acute ankle injuries in our pediatric ED without increasing LOS, return visits or need for orthopedic referrals for missed injuries. Just as in the derivation and validation studies, the reductions have been sustained and reduced unnecessary testing and ionizing radiation.

**Keywords:** quality improvement, decision rules, ankle imaging

#### P017

##### **A time-driven activity-based costing method to estimate health care costs in the emergency department**

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**Introduction:** Poor physicians' knowledge of health care costs has been identified as an important barrier to improving efficiency and reducing overuse in care delivery. Moreover, costs of tests and treatments estimated with traditional costing methods have been shown to be imprecise and unreliable. We estimated the cost of frequent care activities in the emergency department (ED) using the time-driven activity-based costing (TDABC) method. **Methods:** We conducted a TDABC study in the ED of the CHUL, Québec city (77000 visits/year). We estimated the cost of all potential care activities (e.g. triage) provided to adult patients with selected urgent (e.g. pulmonary sepsis) and non urgent (e.g. urinary tract infection) conditions frequently encountered in the ED. Following Lean management principles, process maps were developed by a group of ED care providers for each care activity to identify human resources, supplies and equipment involved, and to estimate the time required to complete each process. Resource unit cost (e.g. cost per minute of a nurse) and overhead rate were calculated using financial information from fiscal year 2015-16. Estimated cost of each care activity (e.g. chest X-ray) including physicians' charges was calculated by summing overhead allocation and the cost of each process (e.g. disinfection of the X-ray machine) as obtained by multiplying the resource unit cost by the time for process completion. **Results:** Process maps were developed for 14 conditions and 68 ED care activities. We estimated the costs of activities (CAN\$) related to nursing (e.g. urinalysis and culture triage ordering \$14.70), clerk tasks (e.g. patient registration \$3.40), physicians (e.g. FAST scan \$20.90), laboratory testing (e.g. CBC \$6.30), diagnostic imaging (e.g. abdominal CT scan \$146.50), therapy (e.g. 5 mg of iv morphine \$20.40), and resuscitation (rapid sequence intubation with ketamine and succinylcholine \$146.40). Overall, emergency physicians' charges, personnel salaries and overheads accounted for 38%, 22% and 16% of all ED care costs, respectively. **Conclusion:** Our results represent an important step toward increasing emergency physicians' awareness on the real cost of their interventions and empowering them to adopt more cost-effective practice patterns.

**Keywords:** activity-based costing, efficiency, performance

#### P018

##### **Prehospital diversion of mental health patients to a mental health center vs the emergency department: safety and compliance of an EMS direct transport protocol**

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**Introduction:** Prehospital transport of patients to an alternative destination (diversion) has been proposed as part of a solution to overcrowding in emergency departments (ED). We evaluated compliance and safety of an EMS protocol allowing paramedics to transport medically stable patients with psychiatric issues directly to an alternate facility [Crisis Intervention (CI)], bypassing the ED. Patients were eligible for diversion if they were  $\geq 18$  years old, classified as CTAS III-IV, scored  $< 4$  on the Prehospital Early Warning (PHEW) score, and did not have any vital sign parameters in a danger zone (as per PHEW score criteria). **Methods:** A retrospective analysis was conducted on patients presenting to Sudbury EMS with behavioural or psychiatric issues. Data was abstracted from EMS reports, hospital medical records, and discharge forms from CI. Protocol compliance was measured using missed protocol opportunities (patients eligible for diversion but taken directly to the ED) and protocol noncompliance rates; protocol safety was

measured using protocol failure (presentation to ED within 48 hours of appropriate diversion) and patient morbidity rates (hospital admission within 48 hours of diversion). Data was analysed qualitatively and quantitatively using proportions. **Results:** EMS responded to 695 calls with psychiatric complaints. Of the 650 taken directly to the ED, 18 met diversion criteria; these were missed protocol opportunities (3%). 45 patients were diverted. There was protocol noncompliance in 36 cases (80%), but 34 were due to incomplete recording of vital signs. There were direct protocol violations in only 2 cases (4%). There was protocol failure in 3 cases (33%), and patient morbidity in 8 cases (18%). No patients died within 48 hours of diversion. **Conclusion:** EMS providers were highly compliant with the protocol when transporting patients directly to the ED. There were high levels of protocol non-compliance in diverting patients to CI, though this is largely attributed to incomplete recording of vital signs; direct protocol violations were low. The protocol provides moderate levels of safety in diverted patients. Broader implementation of a diversion protocol could reduce the volume of mental health patients seen in the ED, and improve quality of care received by this patient population.

**Keywords:** prehospital care, diversion, mental health

#### P019

##### **Prehospital diversion of intoxicated patients to a detoxification facility vs the emergency department: safety and compliance of an EMS direct transport protocol**

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**Introduction:** Prehospital transport of patients to an alternative destination (diversion) has been proposed as part of a solution to overcrowding in emergency departments (ED). We evaluated compliance and safety of an EMS bypass protocol allowing paramedics to transport intoxicated patients directly to an alternate facility [Withdrawal Management Services (WMS)], bypassing the ED. Patients were eligible for diversion if they were  $\geq 18$  years old, classified as CTAS level III-IV, scored  $< 4$  on the Prehospital Early Warning (PHEW) score, and did not have any vital sign parameters in a danger zone (as per PHEW score criteria). **Methods:** A retrospective analysis was conducted on intoxicated patients presenting to Sudbury EMS. Data was abstracted from EMS reports, hospital medical records, and discharge forms from WMS. Protocol compliance was measured using missed protocol opportunities (patients eligible for diversion but taken directly to the ED) and protocol noncompliance rates; protocol safety was measured using protocol failure (presentation to ED within 48 hours of appropriate diversion) and patient morbidity rates (hospital admission within 48 hours of diversion). Data was analysed qualitatively and quantitatively using proportions. **Results:** EMS responded to 681 calls for intoxication. Of the 568 taken directly to the ED, 65 met diversion criteria; these were missed protocol opportunities (11%). 113 patients were diverted. There was protocol noncompliance in 41 cases (36%), but 35 were due to incomplete recording of vital signs. There were direct protocol violations in only 6 cases (5%). There was protocol failure in 16 cases (22%), and patient morbidity in 1 case (1%). No patients died within 48 hours of diversion. **Conclusion:** EMS providers were fairly compliant with the protocol when transporting patients directly to the ED. There was some protocol non-compliance with patients diverted to WMS, though this is largely attributed to incomplete recording of vital signs; direct protocol violations were low. The protocol provides high levels of safety for patients diverted to WMS. Broader implementation of the protocol could reduce the volume of intoxicated patients seen in the ED, and improve quality of care received by this population.

**Keywords:** prehospital care, diversion, alcohol intoxication

#### P020

##### **Ultrasound-guided peripheral intravenous access in the emergency department: A randomized controlled trial comparing single and dual-operator technique**

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**Introduction:** Intravenous (IV) cannulation is a common and important procedure in the emergency department (ED). Ultrasound-guided IV (UGIV) insertion has been shown to be more effective than the blind approach for patients with difficult IV access. The optimal technique for UGIV insertion has not been determined. The objective of this study is to compare the first-attempt cannulation success rate between a single-operator technique (provider holds the ultrasound probe while simultaneously placing the IV), with dual-operator technique (whereby a second provider holds the probe) in ED patients with predicted difficult access. **Methods:** We conducted a randomized controlled trial using a convenience sample of adult ED patients. Participating ED nurses received a one-hour UGIV training session on including didactic and practical training on simulated arms. Patients were enrolled if they met any of three criteria for difficult access: (1) history of difficult access, (2) no visible or palpable veins, or (3) two failed blind attempts. High-acuity patients or those unable to consent or comply with the procedure were excluded. Eligible patients were randomized to single or dual-operator technique and a maximum of two UGIV attempts were allowed. The primary outcome was first-attempt success rate. Additional outcomes included overall success rate, number of attempts, time to successful cannulation (needle insertion to flashback), patient pain scores, operator 'ease of use' scores, and complications 30 minutes after insertion including IV failure. Other variables collected included patient demographics, presenting complaint, indication for ultrasound use, relevant medical history, and location/depth of the target vessel. Fisher's exact test was used to compare success rates between groups. **Results:** Data collection was ongoing at the time of submission, but is expected to be completed by May 01, 2017. **Conclusion:** This is the first randomized-controlled trial comparing single and dual-operator ultrasound technique for difficult IV insertion in ED patients. The results from this study will provide evidence to guide education, and ensure best practice of UGIV insertion in the ED.

**Keywords:** ultrasound, vascular access, nurse education

#### P021

##### **A 'Pawitive' addition to the ER patient experience: A pilot evaluation of the St. John Ambulance therapy dog program in a Canadian hospital**

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**Introduction:** Animal-assisted interventions (AAI) have been applied in numerous clinical settings to help reduce pain, stress, and anxiety. This qualitative study sets out to evaluate the St. John Ambulance Therapy Dog program in the emergency department of the Royal University Hospital. **Methods:** An observer identified patients interested in visiting with a Therapy Dog during their emergency department stay and obtained consent. Participants were asked to indicate on a pictographic scale their physical and mental states before and after the visit. The Therapy Dog team, consisting of a dog and handler, visited the patient for 5-10 minutes. During this time an observer took notes. Participants were asked at the conclusion of the visit to answer questions regarding their overall experience with the Therapy Dog team.