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Variability in utilization and diagnostic yield of computed tomography (CT) scans for pulmonary embolism among emergency physicians

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Introduction: Current data on utilization of CT imaging point to a trend of increasing overutilization of CT Angiography for the diagnosis of pulmonary embolism (CTPA) over time. Multiple educational and institution-wide interventions addressing this overutilization have been proposed, implemented and evaluated, with mixed results in terms of long-term impact on physician ordering behaviour. The objective of this study is to examine the inter-physician variability in ordering rates and diagnostic yield of CTPA, under a working hypothesis that a small number of physicians are responsible for a disproportionately high number of CTPA ordered in the ED. **Methods**: Data was collected on all CTPA studies ordered by ED physicians at two very high volume community hospitals and an affiliated urgent care centre during the 2-year period between January 1, 2016 and December 31, 2017. Analysis was limited to those ED physicians who had a total of greater than 500 ED visits over the course of the 2-year period. For each physician, two calculations were made: 1) CT PE ordering rate (total number of CTPA ordered divided by the total number of ED visits), and 2) CTPA diagnostic yield (total number of CTPA positive for PE divided by the total number CTPA ordered). Additional analysis was carried out in order to identify the highest orderers of CTPA and their diagnostic yield. **Results**: A total of 2,789 CTPA were ordered by 84 physicians for 461,045 total ED visits. Preliminary results show a great deal of variation in ordering rates, ranging from 0.9 to 22.2 CTPA per 1000 ED visit (median = 4.8, IQR = 4.5). Similarly, there was high variation in CT PE yield, ranging from 0% to 50% (median = 9.6%, IQR = 13.1%). Those physicians in the top quartile for ordering rate had a lower mean diagnostic yield, when compared to the lower quartiles (8.9% when compared to 11.5%, 11.9% and 18.2% for the physicians in the third, second, and first quartile respectively). **Conclusion**: The findings of this study indicate a wide degree of variability in CTPA ordering patterns and diagnostic yield among physicians working within the same clinical environment. There is some suggestion that those physicians who order disproportionately higher numbers of CTPAs have lower diagnostic yields. However, the more interesting lessons from this initial study center on the challenges in creating an audit-and-feedback program targeting CTPA 'overutilizers'.

Keywords: computed tomography, health services utilization, pulmonary embolism

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Geographies of sexual assault: using geographic information system analysis to identify neighbourhoods affected by violence

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Introduction: Emergency Departments are a common point of access for survivors of sexual and gender-based violence (SGBV), but very little is known about where survivors live and the characteristics of the neighbourhoods. The objective of this study was to use hospital-based data to characterize sexual and domestic assault cases and identify geographic distribution across the Ottawa-Gatineau area. **Methods**: Data for this study were extracted from the Sexual Assault and Partner Abuse Care Program (SAPACP) case registry (Jan 1-Dec 31, 2015) at The Ottawa Hospital. Spatial analyses were conducted using 6-digit postal codes converted to Canadian Census Tracts to identify potential geographic areas where SGBV cases are clustered. Hot-spots were defined as Census Tracts with seven or more assaults within a single calendar year.Data for this study were extracted from the Sexual Assault and Partner Abuse Care Program (SAPACP) case registry (Jan 1-Dec 31, 2015) at The Ottawa Hospital. Spatial analyses were conducted using 6-digit postal codes converted to Canadian Census Tracts to identify potential geographic areas where SGBV cases are clustered. Hot-spots were defined as Census Tracts with seven or more assaults within a single calendar year. **Results**: In 2015, there were 406 patients seen at the SAPACP, 348 had valid postal codes from Ottawa-Gatineau and were included in the analyses. Over 90% of patients were female and 152 (43.68%) were below 24 years of age. Eight hot-spots were identified including 3 in the downtown entertainment district, 3 lower income areas, 1 high income neighbourhood, and 1 suburb more than 20km from downtown. **Conclusion**: This study is of the first to use hospital-based data to examine the geographic distribution of SGBV cases, with key findings including the identification of high-income neighbourhoods and suburbs as SGBV hot-spots. Alongside efforts like the #MeToo movement, this evidence challenges stereotypes of assault survivors and highlights the breadth and widespread nature of SGBV.

Keywords: domestic violence, intimate partner violence, sexual assault

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Outcomes of out of hospital cardiac arrest in First Nations vs. non-First Nations patients in Saskatoon

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Introduction: One in nine (11.7%) people in Saskatchewan identifies as First Nations. In Canada, First Nations people experience a higher burden of cardiovascular disease when compared to the general population, but it is unknown whether they have different outcomes in out of hospital cardiac arrest (OHCA). **Methods**: We reviewed prehospital and inpatient records of patients sustaining an OHCA between January 1st, 2015 and December 31st, 2017. The population consisted of patients aged 18 years or older with OHCA of presumed cardiac origin occurring in the catchment area of Saskatoon's EMS service. Variables of interest included, age, gender, First Nations status (as identified by treaty number), EMS response times, bystander CPR, and shockable rhythm. Outcomes of interest included return of spontaneous circulation (ROSC), survival to hospital admission, and survival to hospital discharge. **Results**: In all, 372 patients sustained OHCA, of which 27 were identified as First Nations. First Nations patients with OHCA tended to be significantly younger (mean age 46 years vs. 65 years, $p < 0.0001$) and had shorter EMS response times (median times 5.3 minutes vs. 6.2 minutes, $p = 0.01$). There were no differences between First Nations and non-First Nations patients in terms of incidence of shockable rhythms (24% vs. 26%, $p = 0.80$), ROSC (42% vs. 41%, $p = 0.87$), survival to admission (27% vs 33%, $p = 0.53$), and survival to hospital discharge (15% vs. 12%, $p = 0.54$). **Conclusion**: In Saskatoon, First Nations patients

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sustaining OHCA appear to have similar survival rates when compared with non-First Nations patients, suggesting similar baseline care. Interestingly, First Nations patients sustaining OHCA were significantly younger than their non-First Nations counterparts. This may reflect a higher burden of cardiovascular disease, suggesting a need improved prevention strategies.

Keywords: emergency medical services, First Nations, out of hospital cardiac arrest

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Impact of young age on outcomes of emergency department procedural sedation

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Introduction: Procedural sedation in the emergency department (ED) for children undergoing painful procedures is common practice, however little is known about sedation in very young children. We examined the effect of young age on sedation outcomes. **Methods**: This is a secondary analysis of an observational cohort study of children 0-18 years undergoing procedural sedation in six pediatric EDs across Canada. We compared presedation state, indication for sedation, medications, sedation efficacy and four main post-sedation outcomes (serious adverse events (SAE), significant interventions, oxygen desaturation and vomiting) between patients who ≤2 years with those >2 years. Pre-sedation state, medications, indication for sedation and time intervals were summarized using frequency and percentage and compared with chi2 test. Logistic regression was used to examine associations between age group and outcomes. **Results**: 6295 patients were included; 5349 (85%) were >2 years and 946 (15%) were ≤2 years. Children ≤2 years were sedated most commonly for laceration repair (n = 450; 47.6%), orthopedic reduction (165; 17.4%) and abscess incision and drainage (136; 14.4%). Children >2years were sedated most commonly for orthopedic reductions (3983; 74.5%). Ketamine was the most common medication in both groups, but was used most frequently in children ≤2 years (80.9% vs 58.9%; $p < 0.001$). There was no difference in the incidence of SAE, significant interventions or oxygen desaturation between age groups, however children ≤2 years were less likely to vomit (Table 1). Young children had decreased odds of a successful sedation (OR 0.48; 95% CI: 0.37 to 0.63). On average, patients ≤2 years were sedated for 7 minutes less (74.1 vs 81.0 $p < 0.001$) and discharged 10 minutes sooner (90.1 vs 100.8 $p < 0.001$). Table 1 ≤2 years (n = 946) >2 years (n = 5349) OR (95%CI)* p-value n(%) n(%) Serious Adverse Event 8 (0.85) 59 (1.0) 0.76 (0.43-1.7) 0.477 Significant intervention 10 (1.0) 76 (1.4) 0.74 (0.34-1.4) 0.374 Oxygen Desaturation 50 (5.3) 303 (5.6) 0.93 (0.67-1.3) 0.640 Vomiting 14 (1.5) 314 (5.9) 0.24 0.13-0.41) <0.001 *Reference category: ≤2 years. **Conclusion**: Children ≤2 years most commonly received ED sedation for laceration repair using ketamine. Young age was not associated with a significant difference in SAEs, significant intervention or desaturation but was associated with decreased odds of vomiting and of successful sedation.

Keywords: pain, pediatric, sedation

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Procedural skills training in emergency medicine physicians within the Edmonton zone: a needs assessment

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Introduction: Procedural skills are a key component of an emergency physician's practice. The Edmonton Zone is a health region that comprises eleven tertiary, urban community and rural community emergency departments (EDs) that represents over three hundred emergency physicians. We report the initial stakeholder and site leadership needs assessment used to inform the development of a comprehensive continuing professional development (CPD) procedural skills curriculum for the Edmonton Zone. **Methods**: A list of procedural skills was distributed to the two Edmonton Zone Clinical Department Heads of Emergency Medicine (EM). This list was based on a previous Canadian study that utilized procedures from the Objectives of Training in EM. Based on perceived needs, twenty-five procedures were chosen by consensus from zone leadership and study authors as the initial focus for a skills curriculum. This list was sent via survey to the physician site leads of all EDs in the zone. Each site lead was asked to indicate the fifteen procedure curriculum they felt would most benefit their respective physician groups. Responses were collated to look at all departments as a group and stratified by the type of ED (tertiary, urban and rural community). **Results**: Every site chief of Edmonton Zone EDs completed the survey (100% response rate). Cricothyrotomy and pediatric intubation were the two procedures prioritized by every site. One procedure (ultrasound guided central lines) was prioritized by 10/11 sites while three procedures (ultrasound guided central lines, adult intubation and chest tube insertion) were specified by 9/11 sites as needs. Two procedures (pericardiocentesis and thoracotomy) were named as priorities only by tertiary centers. Conversely, three procedures (extensor tendon repair, anterior and posterior nasal packing) were highlighted by all rural sites, but not consistently by any urban sites. **Conclusion**: Over the next few years, competency-based CPD will emerge for physicians in practice. Our preliminary needs assessment showed that while a common zone-wide curriculum will be possible, targeted curricula tailored to the unique needs of the various types of EDs will also be necessary. This has implications for the resources and teaching requirements needed to deliver effective and recurring CPD courses to an entire health region. A targeted needs assessment to all Edmonton Zone physicians will be the next step to verify and further elaborate on these preliminary results.

Keywords: continuing professional development, curriculum, simulation

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Older adults in the emergency department: a retrospective cross-sectional study of the geriatric population in Edmonton emergency departments

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Introduction: The geriatric patient population accounts for an ever increasing proportion of emergency department (ED) visits. Geriatric centered EDs are an emerging area of interest and research. Though there have been past studies looking at older patient presentations at individual hospitals, there is limited data describing geriatric presentations within an entire Canadian geographic health region. This study characterizes the population of older adults utilizing the EDs in the Edmonton Zone, a health region that comprises a total of eleven tertiary (T), urban community (UC) and rural community (RC) hospitals. **Methods**: This retrospective cross-sectional study targeted all patients ≥65 years presenting to the Edmonton Zone EDs between April 1, 2017 to March 31, 2018. Data was extracted from the

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