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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 pre-hospital 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