

**Keywords:** clinical decision rule, computed tomography, minor head injury

### P038

#### Comparison of diagnostic imaging rates between workplace and non-workplace injuries in the emergency department: a ten-year review

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**Background:** In Canada, injuries represent 21% of Emergency Department (ED) visits. Faced with occupational injuries, physicians may feel pressured to provide urgent imaging to facilitate expedited return to work. There is not a body of literature to support this practice. Twenty percent of adult ED injuries involve workers compensation. **Aim Statement:** Tacit pressures were felt to impact imaging rates for patients with workplace injuries, and our aim was to determine if this hypothesis was accurate. We conducted a quality review to assess imaging rates among injuries suffered at work and outside work. A secondary aim was to reduce the harm resulting from non-value-added testing. **Measures & Design:** Information was collected from the Emergency Department Information System on patients with acute injuries over the age of 16-years including upper limb, lower limb, neck, back and head injuries. Data included both workplace and non-work-related presentations, Canadian Triage and Acuity Scale (CTAS) levels and age at presentation. Imaging included any of X-ray, CT, MRI, or Ultrasound ordered in EDs across the central zone of Nova Scotia from July 1, 2009 to June 30, 2019. A total of 282,860 patient-encounters were included for analysis. Comparison was made between patients presenting under the Workers' Compensation Board of Nova Scotia (WCB) and those covered by the Department of Health and Wellness (DOHW). Imaging rates for all injuries were also trended over this ten-year period. **Evaluation/Results:** In patients between 16 and 65-years, the WCB group underwent more imaging (55.3% of visits) than did the DOHW group (43.1% of visits). In the same cohort, there was an overall decrease of over 10% in mean imaging rates for both WCB and DOHW between the first five-year period (2009-2013) and the second five-year study period (2013-2018). Imaging rates for WCB and DOHW converged with each decade beyond 35 years of age. No comparison was possible beyond 85-years, due to the absence of WCB presentations. **Discussion/Impact:** Patients presenting to the ED with workplace injuries are imaged at a higher rate than those covered by the DOHW. Campaigns promoting value-added care may have impacted imaging rates during the ten-year study period, explaining the decline in ED imaging for all injuries. While this 10% decrease in overall imaging is encouraging, these preliminary data indicate the need for further education on resource stewardship, especially for patients presenting to the ED with workplace injuries.

**Keywords:** quality improvement and patient safety, value-added care, workplace injuries

### P039

#### Utilization of serum D-dimer assays and computed tomography pulmonary angiography (CTPA) scans in the diagnosis of pulmonary embolism among emergency department (ED) physicians

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**Introduction:** As the availability of Computed Tomography Pulmonary Angiography (CTPA) to rule out pulmonary embolism (PE) increases, so too does its utilization, and consequent overutilization. A variety of evidence-based algorithms and decision rules using clinical criteria and D-Dimer testing have been proposed as instruments to allow physicians to safely rule out a PE in low-risk patients. However, studies have shown mixed results with respect to both physician uptake of these decision rules and their impact on improving ordering practices among physicians. The objective of this study is to describe the prevalence of D-Dimer utilization among ED physicians and its impact on positive yield rates of CTPAs in a community setting. **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. For each CTPA, we determined if 1) a D-Dimer had been ordered prior to CTPA, if 2) the D-Dimer was positive, and if 3) the CTPA was positive for a PE. Using a chi-square test, we compared the diagnostic yield for those patients who had a D-Dimer prior to their CTPA and those who did not. **Results:** A total of 2,811 CTPAs were included in the analysis. Of these, 964 CTPAs (34.3%) were ordered without a D-Dimer. Of those 1,847 patients who underwent D-Dimer testing prior to the CTPA, 343 (18.7%) underwent a CTPA despite a negative D-Dimer. When compared as a group, those CTPAs preceded by a D-Dimer showed no significant difference in positive yields when compared to those CTPAs ordered without a prior D-Dimer (9.9% versus 11.3%,  $p = 0.26$ ). **Conclusion:** The findings of this study present a complicated picture of the impact of D-Dimer utilization on CTPA ordering patterns. There is evidence of suboptimal uptake of routine D-Dimer ordering, and adherence to guidelines in terms of forgoing CTPAs in low-risk patients with negative D-Dimers. While this study design leaves unanswered the question of how many CTPAs were avoided as a result of a negative D-Dimer, the finding of a similar positive yield among those patients who had a D-Dimer ordered versus those who did not is interesting, and illustrative of the issues arising from the high false-positive rates associated with D-Dimer screening.

**Keywords:** computed tomography, overutilization, pulmonary embolism

### P040

#### Retrospective assessment of discrepancies in preliminary radiological reports in the emergency department

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**Background:** Preliminary reports and subsequent immediate management decisions of radiological scans are often performed by emergency physicians and on-call radiology residents. Many academic hospitals have resident-only coverage for after-hour shifts. Generally, these preliminary reports are eventually reviewed by a staff radiologist, during which discrepancies may be identified. Depending on the severity of the discrepancy and the time taken to notify the treating physician, there is potential for significant impact on the patient's care. **Aim Statement:** In an attempt to identify and minimize errors in radiological readings, and to improve the communication of discrepancies, our project aims to retrospectively audit all radiological discrepancies that have occurred at The Ottawa Hospital's emergency departments from April 2018 to May 2019. **Measures & Designs:** A systematic review of all cases with noted radiological discrepancies was obtained from the Picture Archive and Communication System

software and EPIC platform. Analysis of these cases will allow us to define when errors occur, what is the type and severity of the error, how long it took to relay the discrepancy to a treating physician, and what was the subsequent management impact. **Evaluation/Results:** We discovered 712 cases with radiological reading discrepancies, 168 major, 527 minor, and 17 incidentals. Interestingly, a significant portion of major (severely affecting care/life-threatening) discrepancies were reported from radiology residents, especially on CT images, although emergency physicians had the most discrepancies (mostly minor). Radiology residents were seen to have more discrepant reports during after-hour services while emergency physicians did not show any specific pattern of discrepant reporting. The average time to report a major discrepancy to a treating physician is 8.8 hours, where the maximum time taken was 104 hours and the minimum was 0.2 hours. 56% of reports with major discrepancies made no mention of who was notified. **Discussion/Impact:** By identifying weak points in radiological reporting, our results will allow us to provide suggestions at an administration and teaching level to minimize discrepancies. It is critical to create a workflow where mistakes are mitigated, and communication is efficient and standardized to prevent patient harm from delayed or incorrect diagnosis.

**Keywords:** emergency department, quality improvement and patient safety, radiology discrepancy

#### P041

##### Point-of-care ultrasound utilization and monetary outcomes (POCUMON) study

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**Introduction:** Point-of-care ultrasound (POCUS) is an integral tool in the modern emergency physician's toolkit. Evidence suggests many imaging and lab investigations are ordered without true medical indications; it is unknown how POCUS utilization impacts health care costs at a patient level. The purpose of this study was to assess whether POCUS use in the emergency department (ED) was associated with cost savings via decreased laboratory and radiographic testing. **Methods:** POCUMON is a single-center, prospective pilot study. The participants were a convenience sample of ED staff physicians and PGY-5 Emergency Medicine (EM) residents working in the ED from July-October 2019. Physicians who used POCUS as part of their assessment had the cost of their patient investigation plans compared with those proposed by a control group of ED physicians simultaneously on-shift. The control group was blinded to the POCUS findings but had access to the patient and medical record. The lab investigations and imaging studies ordered by both groups were recorded with respective costs. Data were analyzed using a paired T-test, with sub-group analyses. Ethics approval was obtained from the Queen's University HSREB (No.6026732). **Results:** 50 patient assessments using POCUS were captured in the study period. 76% of patient assessments were performed by EM staff physicians; 94% of control assessments were provided by EM staff physicians. Patient chief complaints included abdominal pain (7), chest pain/dyspnea (10), flank pain (3), pregnancy concerns (4), trauma (7), extremity complaints (4), back pain (3), and other (12). The POCUS group had a trend for lower number of laboratory tests ( $4.7 \pm 0.44$  vs  $5.22 \pm 0.39$ ;  $p = 0.28$ ) and imaging studies ( $0.94 \pm 0.14$  vs  $1.1 \pm 0.11$ ;  $p = 0.33$ ). Overall health care costs were similar in both groups, with a

trend to cost savings in the POCUS group ( $\$142.00 \pm 15.44$  vs  $\$174.60 \pm 17.00$ ;  $p = 0.12$ ). Subgrouping identified significant cost savings in the POCUS group for patients with a chief complaint of flank pain ( $\$43.64$  vs  $\$248.82$ ,  $p = 0.01$ ). **Conclusion:** POCUS use was not associated with significant health care cost savings. ED POCUS usage did see a trend towards decreased laboratory and imaging investigations. Patients presenting with flank pain had significantly lower expenditures associated with their visit when POCUS was incorporated into their assessment. Large scale prospective studies are needed to investigate if POCUS is associated with cost-savings in ED patients.

**Keywords:** cost analysis, point-of-care ultrasound

#### P042

##### Workplace-based assessment in emergency medicine: how do physicians use entrustment anchors?

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**Introduction:** Competency based medical education (CBME) has triggered widespread utilization of workplace-based assessment (WBA) tools in postgraduate training programs. These WBAs predominately use rating scales with entrustment anchors, such as the Ottawa Surgical Competency Operating Room Evaluation (O-SCORE). However, little is known about the factors that influence a supervising physician's decision to assign a particular rating on scales using entrustment anchors. This study aimed to identify the factors that influence supervisors' ratings of trainees using WBA tools with entrustment anchors at the time of assessment and to explore the experiences with and challenges of using entrustment anchors in the emergency department (ED). **Methods:** A convenience sample of full-time emergency medicine (EM) faculty were recruited from two sites within a single academic Canadian EM hospital system. Fifty semi-structured interviews were conducted with EM physicians within two hours of completing a WBA for an EM trainee. Interviews were audio-recorded, transcribed verbatim, and independently analyzed by two members of the research team. Themes were stratified by trainee level, rating and task. **Results:** Interviews involved 73% (27/37) of all EM staff and captured assessments completed on 83% (37/50) of EM trainees. The mean WBA rating of studied samples was  $4.34 \pm 0.77$  (2 to 5), which was similar to the mean rating of all WBAs completed during the study period. Overall, six major factors were identified that influenced staff WBA ratings: amount of guidance required, perceived competence through discussion and questioning, trainee experience, clinical context, past experience working with the trainee, and perceived confidence. The majority of staff denied struggling to assign ratings. However, when they did struggle, it involved the interpretation of WBA anchors and their application to the clinical context in the ED. **Conclusion:** Several factors appear to be taken into account by clinical supervisors when they make decisions regarding the particular rating that they will assign a trainee on a WBA that uses entrustment anchors. Not all of these factors are specific to that particular clinical encounter. The results from this study further our understanding on the use of entrustment anchors within the ED and may facilitate faculty development regarding WBA completion as we move forward in CBME.

**Keywords:** assessment, education, entrustment