Introduction: Emergency Physician (EP) performance comprises both quality of care and quantity of patients seen in a set time. Emergency Department (ED) overcrowding increases the importance of the ability of EPs to see patients as rapidly as is safely possible. Maximizing efficiency requires an understanding of variables that are associated with individual physician performance. While using the incidence of return visits within 48 hours as a quality measure is controversial, repeat visits do consume ED resources. **Methods:** We analysed the practice variables of 85 EPs working at a single academic ED, for the period from June 1, 2013 to May 31, 2017, using data from an emergency department information system (EDIS). Variables analysed included: number of shifts worked, number of patients seen per hour (pt/hr), an adjusted workload measurement (assigning a higher score to CTAS 1-3 patients), percentage of patients whose care involved an ED learner, and the percentage of patients who returned to the ED within 48 hours of ED discharge. Resource utilization was measured by percentage of diagnostic imaging (ultra sound (US), CT scan (CT), x-ray (XR)) ordered and percentage of patients referred to consulting services. We performed principal component analyses to identify bench marks of resource use, demographic (age, EM qualification, gender) and other practice related predictors of performances. **Results:** Mean pt/hr differed significantly by EM Qualification for CTAS 2-4, with 1.71/hr (95% Confidence Interval = 1.63-1.77) by FRCPS physicians, compared to 1.89/hr by CCFP(EM) (CI = 1.81-1.97). There were no differences for CTAS 1 and 5. Other variables associated with a significantly lower pt/hr, included a greater use of imaging, (CT: $p = 0.0003$, XR: $p = 0.0008$) although this was did not reach statistical significance with US ($p = 0.06\%$). Female gender, older age, number of patient consultations for CTAS 3 and more patients seen by a learner were all associated with lower pt/hr. Pt/hr was a better predictor ($R2 = 45\%$) for EP resource utilization than adjusted workload measurement ($R2 = 35\%$). Higher use of CT was associated with fewer return visits in <48 hrs (0.13% lower). Male gender, younger age, number of patient consultation for CTAS 3 and fewer patients seen by a learner were all associated with an increase in return visits. **Conclusion:** We found a significant difference in pt/hr rates and return visits within 48 hours between EPs with different age ranges, gender, and EM certification. Increased use of CT scan and x-ray, and consultation for patients CTAS 3 were associated with lower pt/hr. Return visit rates also varied in association with diagnostic imagine use, age, gender and number of patients seen by a learner. Further research is needed to assess the association with these variables on quality of care.

Keywords: emergency physician productivity, emergency department efficiency

LO69

Factors related to the eventual publication of abstracts presented at the Canadian Association of Emergency Physicians annual meeting from 2013-2017

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Introduction: Much of the research presented at conference meetings never go on to be published in peer-reviewed literature, thereby limiting the dispersion of these findings to a larger audience. We sought to assess if this was true with regard to CAEP meetings, by establishing the publication rate and factors correlated with publication of CAEP abstracts in peer-reviewed journals from 2013-2017. **Methods:** We conducted a scoping review that included all CAEP abstracts from 2013-2017, obtained through the Canadian Journal of Emergency Medicine. Two reviewers screened and extracted data from all abstracts individually, with any conflicts resolved by a third reviewer. Data extracted from abstracts included province of authors, sample size, study design, the presence of statistically positive or negative findings, status of publication, date of acceptance to a journal, and journal of publication. Databases searched for publication status included MEDLINE, EMBASE, The Cochrane Library and Ovid Health Star. A level of evidence (LOE) was assigned using the 2011 Oxford Centre for Evidence-Based Medicine criteria. **Results:** All abstracts (1090) from 2014-2017 have been analyzed thus far. Inter-rater agreement for data extraction was high (value 0.85). 17.1% (186/1090) of abstracts presented at the conference had a corresponding full text publication in the peer-reviewed literature. Articles were published in 102 different journals, with the greatest number of publications in the Canadian Journal of Emergency Medicine (CJEM) (15.1%, 28/186), followed by Academic Emergency Medicine (10.2%, 19/186). The mean time to publication was 51 weeks (95% CI 43,59). 30.6% (57/186) of published abstracts had statistically positive findings, while 10.8% (20/186) had negative findings. A significant difference was present between publication findings and publication status ($p < 0.0001$, chi-squared). 68.8% (128/186) of published articles were of level III evidence. A statistical difference was found between LOE and publication status ($p < 0.0001$, chi-squared). **Conclusion:** A large number of abstracts presented at CAEP are presently unpublished. There may be a publication bias in the literature as a greater number of studies with positive findings have been published. Additionally, two-thirds of studies published are of level III evidence. An increasing emphasis should be placed in publishing studies with higher levels of evidence, and more studies with negative findings.

Keywords: evidence-based medicine, level of evidence, quality of research

LO70

Interrater agreement and time it takes to assign a Canadian Triage and Acuity Scale score pre and post implementation of eCTAS

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Introduction: In addition to its clinical utility, the Canadian Triage and Acuity Scale (CTAS) has become an administrative metric used by governments to estimate patient care requirements, ED funding and workload models. The Electronic Canadian Triage and Acuity Scale (eCTAS) initiative aims to improve patient safety and quality of care by establishing an electronic triage decision support tool that standardizes the application of national triage guidelines (CTAS) across Ontario. The objective of this study was to evaluate the implementation of eCTAS in a variety of ED settings. **Methods:** This was a prospective, observational study conducted in 7 hospital EDs, selected to represent a mix of triage processes (electronic vs. manual), documentation practices (electronic vs. paper), hospital types (rural, community and teaching) and patient volumes (annual ED census ranged from 38,000 to 136,000). An expert CTAS auditor observed on-duty triage nurses in the ED and assigned independent CTAS in real time. Research assistants not involved in the triage process independently recorded the triage time. Interrater agreement was estimated using unweighted and quadratic-weighted kappa statistics with 95% confidence intervals (CIs). **Results:** 1200 (738 pre-eCTAS, 462 post-implementation) individual patient CTAS assessments were audited over 33 (21 pre-eCTAS, 11 post-implementation) seven-hour triage shifts. Exact modal

agreement was achieved for 554 (75.0%) patients pre-eCTAS, compared to 429 (93.0%) patients triaged with eCTAS. Using the auditors CTAS score as the reference standard, eCTAS significantly reduced the number of patients over-triaged (12.1% vs. 3.2%; 8.9, 95% CI: 5.7, 11.7) and under-triaged (12.9% vs. 3.9%; 9.0, 95% CI: 5.9, 12.0). Interrater agreement was higher with eCTAS (unweighted kappa 0.90 vs. 0.63; quadratic-weighted kappa 0.79 vs. 0.94). Research assistants captured triage time for 4403 patients pre-eCTAS and 1849 post implementation of eCTAS. Median triage time was 304 seconds pre-eCTAS and 329 seconds with eCTAS (25 seconds, 95% CI: 18, 32 seconds). **Conclusion:** A standardized, electronic approach to performing CTAS assessments improves both clinical decision making and administrative data accuracy without substantially increasing triage time.
Keywords: triage, electronic Canadian Triage and Acuity Scale, interrater agreement

LO71

Implementation strategies to promote provider behaviour change in emergency departments

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Introduction: Translating research evidence into routine clinical practice in emergency departments (EDs) often requires changing the behavior(s) of one or more member of the healthcare team. Changing strongly entrenched behavior patterns or occasional behaviors that are impacted by psychological, social or environmental factors can be challenging. We conducted a systematic review of the literature to identify implementation strategies that have been evaluated to change ED provider behavior and promote the uptake of evidence in emergency practice settings. **Methods:** The following databases were systematically searched from inception to 2017 with the support of a library scientist: MEDLINE, CINAHL, Embase and Cochrane CENTRAL. We also manually searched the last 5 years of Annals of Emergency Medicine, Canadian Journal of Emergency Medicine, and Implementation Science. Studies were assessed by two independent reviewers and retained if they included one or more of the implementation strategies listed in the Cochrane Effective Practice and Organization of Care (EPOC) Taxonomy, targeted any health care provider working in any type of emergency department. The Cochrane Risk of Bias tool was used to assess study quality. **Results:** Following review of 13,000 title and abstracts, 33 studies met the inclusion criteria. The majority of included studies were randomized control trials (N = 32) and 50% were published in the last seven years. Although poorly described, interventions targeted either physicians (n = 12), nurses (n = 8), pharmacists (n = 1) or multi-disciplinary teams (n = 12). Common behavioral targets included compliance with practice guidelines, test ordering and prescribing. According to the EPOC Taxonomy most implementation strategies were multicomponent and could be categorized as either educational materials/meetings and/or reminders. Only one study author reported using evidence to inform the design of the implementation strategy. Effect sizes varied across relevant study outcomes but the direction of effect was positive in 22/33 included studies. Heterogeneity of study interventions and outcomes precluded meta-analysis. **Conclusion:** To strengthen the evidence base regarding implementation strategies that promote provider behavior change across different ED contexts, there is a critical need to improve both the design and reporting of implementation strategies in ED research.
Keywords: implementation science, healthcare provider behaviours, evidence-based practice

LO72

A randomized controlled trial of electronic clinical decision support to reduce unnecessary CT imaging for patients with mild traumatic brain injury

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Introduction: Utilization of CT imaging has risen dramatically with increases in availability, but without corresponding improvements in patient outcomes for many clinical scenarios. Previous attempts to improve imaging appropriateness have met with limited success, with commonly cited barriers including a lack of confidence in patient outcomes, medicolegal risk, and patient expectations. The objective of this study was to assess the impact of an electronic clinical decision support (CDS) intervention to reduce CT utilization for emergency department (ED) patients with mild traumatic brain injury (MTBI). **Methods:** This was a cluster-randomized, controlled trial with physicians as the unit of randomization. All emergency physicians (EPs) at 4 urban adult EDs and 1 urgent care center were randomly assigned to receive evidence-based imaging CDS (intervention) or no CDS (control) for patients with MTBI over a 1-year study period. CDS was launched in an external web browser whenever an intervention EP ordered a non-enhanced head CT from the computerized physician order entry (CPOE) system for ED patients CTAS 2-5 with a CEDIS chief complaint of head injury; however, interaction with CDS was voluntary. The CDS tool provided detailed information to physicians about the Canadian CT Head Rule, including patient eligibility, exclusion criteria, risk factors and probability of serious injury, as well as an imaging recommendation (yes/no). CDS recommendations could be printed for the medical record as could educational patient handouts to support physician decision making. The primary outcome was CT utilization for patients with MTBI on the index visit. Secondary outcomes included ED length of stay (LOS), and return visits, CT use, hospital admission and traumatic head injury diagnoses over the next 30-days. This study was REB approved. **Results:** Physician demographics and baseline CT utilization for MTBI patients were similar among intervention and control EPs during a 2-year pre-intervention period. In the first 8-months following CDS implementation, 102 intervention EPs saw 2,189 eligible patients while 100 control EPs saw 1,707 patients. Intervention EPs voluntarily interacted with CDS on 36.2% of eligible encounters. Head CT utilization was lower among intervention EPs than controls (38.5% vs. 45.1%, p < 0.0001) as was ED LOS (201 vs. 218.5 minutes, p < 0.001). There was no difference in 30-day ED return visits, head CT utilization, hospital admission or traumatic head injury diagnoses. **Conclusion:** In one of the largest RCTs of CDS to date, exposure to CDS was associated with decreased head CT utilization and shorter LOS on the index visit, and no difference in 30-day head CT use, return ED visits or hospital admission. These results suggest that a comprehensive CDS implementation may be able to overcome several barriers to use of decision rules and may contribute to improved clinical decision making and decreased CT utilization.
Keywords: clinical decision support, diagnostic imaging, mild traumatic brain injury

LO73

A randomized controlled trial of electronic clinical decision support to reduce unnecessary CT imaging for patients with suspected pulmonary embolism

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