collaborate with community and government partners to ensure programs meet patient needs; 3) address provider attitudes and knowledge gaps through dedicated training; and 4) establish guidelines to identify patients who are at risk of opioid overdose, and engage at-risk patients to maximize THN acceptance. **Conclusion:** ED-based THN programs must be tailored to local community needs and available hospital resources. Innovative implementation strategies are needed to promote ED provider engagement, and reduce barriers to patient acceptance of THN in the ED. This scoping review highlights key considerations for ED-THN implementation that can guide EDs to establish new programs, or refine existing programs to maximize their effectiveness.

Keywords: naloxone, opioid overdose, scoping review

LO25

Characteristics of frequent users of emergency departments in Alberta and Ontario, Canada: an administrative data study

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Introduction: Frequent users to emergency departments (EDs) are a diverse group of patients with a disproportionate number of ED presentations. This study aimed to compare sociodemographic and clinical characteristics of adult high system users (HSUs) and control groups in two provinces. **Methods:** Cohorts of HSUs were created for Alberta and Ontario by identifying the patients with the top 10% of ED presentations in the National Ambulatory Care Reporting System during April 2015 to March 2016. Random samples of patients not in the HSU groups were selected in each province as controls (4:1 ratio). Sociodemographic and presentation data (e.g., Canadian Triage and Acuity Scale [CTAS], disposition) were extracted and compared using separate logistic regression models. **Results:** In Alberta, 101,250 HSU patients made 686,918 ED presentations (median [med] = 5 interquartile range [IQR] 4,7 presentations per patient), compared with 401,923 controls who made 560,765 ED presentations (med = 1 IQR 1,2 per patient). HSUs were more likely to be female (odds ratio (OR) = 1.20 95% confidence interval (CI) 1.18,1.22), older (OR = 1.03 per 5y 95%CI 1.03,1.03), live closer to hospital (OR = 1.02 per 100km 95%CI 1.00,1.03), and be from the lowest income quintile (OR = 1.39 95%CI 1.37,1.42) than controls. In Ontario, 478,424 HSUs made 2,222,487 ED presentations (med = 4 IQR 3,5 per patient) and 1,714,037 controls made 2,114,070 ED presentations (med = 1 IQR 1,1 per patient). Ontario HSUs were also more likely to be female (OR = 1.13 95%CI 1.12,1.14), older (OR = 1.03 per 5y 95%CI 1.03,1.03), and from the lowest income quintile (OR = 1.41 95%CI 1.40,1.42) than controls, but were less likely to live closer to hospital (OR = 0.93 per 100km 95%CI 0.92, 0.93). Higher acuity was seen in Ontario (CTAS 1/2 vs. others OR = 1.05 95%CI 1.04,1.06) but not for Alberta (CTAS 1/2 vs others OR = 0.75, 95%CI 0.74,0.76). Discharges were less likely in the HSUs compared to controls (Alberta OR = 0.89 95%CI 0.88,0,90; Ontario OR = 0.65 95%CI 0.65,0.66). HSUs were more likely to leave without being seen (Alberta OR = 1.10 95%CI 1.07,1.13; Ontario OR = 1.37 95%CI 1.35,1.40) and against medical advice (Alberta OR = 1.47 95%CI 1.41,1.53; Ontario OR = 1.67 95%CI 1.63,1.71). **Conclusion:** HSUs were more likely to be female, older, and poorer than controls. Ontario HSUs had higher acuity than the other groups. Disposition differed for HSUs and controls. Further study is required to identify ways to safely reduce ED utilization by HSUs.

Keywords: administrative data, frequent users

LO26

The mean abnormal response rates of laboratory tests ordered in the emergency department: shooting percentage insights from a multicentre study

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Introduction: There is ongoing concern about the burden placed on healthcare systems by lab tests. Although these concerns are widespread, it is difficult to quantify the extent of the problem. One approach involves use of a metric known as the Mean Abnormal Response Rate (MARR), which is the proportion of tests ordered that return an abnormal result; a higher MARR value indicates higher yield. The primary objective of this study was to calculate MARRs for tests ordered between April 2014 and March 2019 at the four adult emergency departments (EDs) covering a metropolitan population of 1.3 million. Secondary objectives included identifying tests with highest and lowest MARRs; comparison of MARRs for nurse- and physician-initiated orders; correlation of the number of tests per order requisition to MARR; and correlation of physician experience to MARR. **Methods:** In total, 40 laboratory tests met inclusion criteria for this study. Administrative data on these tests as ordered at the four EDs were obtained and analyzed. Multi-component test results, such as from CBC, were consolidated such that an abnormal result for any component was coded as an abnormal result for the entire test. Repeat tests ordered within a single patient visit were excluded. Physician experience was quantified for 209 ED physicians as number of years since licensure. Analyses were descriptive where appropriate for whole-population data. Risk of bias was attenuated by the focus on administrative data. **Results:** The population dataset comprised 33,757,004 test results on 415,665 unique patients. Of these results, 30.3% were the outcomes of nurse-initiated orders. The 5-year MARRs for the four hospitals were 38.3%, 40.0%, 40.7% and 40.9%. The highest per-test MARRs were for BNP (80.5%) and CBC (62.6%), while the lowest were for glucose (7.9%) and sodium (11.6%). MARRs were higher for nurse-initiated orders than for physician-initiated orders (44.7% vs. 38.1%), likely due to the greater order frequency of high-yield CBC in nurse-initiated orders (38.6% vs. 18.1%). The number of tests per order requisition was inversely associated with MARR (r = -0.90, p < 0.001). Finally, the number of years since licensure was modestly but significantly associated with MARR (r = 0.28, p < 0.001). **Conclusion:** This is the first and largest study to apply the MARR in an ED setting. As a metric, MARR effectively identifies differences in test ordering practices on per-test and per-hospital bases, which could be useful for data-informed practice optimization.

Keywords: informatics, laboratory test, mean abnormal response rate

LO27

Relevance of Choosing Wisely Canada non-emergency medicine specialty lists to emergency medicine practice

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Introduction: The Choosing Wisely Canada (CWC) initiative is dedicated towards optimizing patient care and reduce unnecessary

resource use. Different specialty organizations create recommendations lists towards these outcomes. The goal of this study was to examine the applicability of non-Emergency Medicine (EM) recommendations towards EM practice. **Methods:** The entire master recommendations listings spreadsheet was downloaded from the CWC website (March 2019; n = 333). The EM-specific items from the CAEP checklist were deliberately excluded (n = 10). Items were rated by Niagara community EM physicians (n = 7) using the previously validated Best Evidence in Emergency Medicine (BEEM) rating scale (7 point Likert scale) to determine potential impact on EM practice. Items rated "6 or 7/7" were determine as "high relevance." Redundant items were consolidated. **Results:** From the retrieved CWC master list, a total of 102 "highly relevant" recommendations were identified (41 items scored 6/7 [12%], 61 scored 7/7 [18%]; total 31%). Redundant items consolidated included antimicrobial avoidance (n = 18), opioid avoidance for pain (n = 11), reduction of unnecessary imaging (n = 11), and avoidance of routine low back imaging (n = 7). **Conclusion:** There are a large number of non-EM specialty recommendations highly relevant to EM practice in the CWC database (31%). Quality improvement initiatives looking to operational CWC recommendations in Canadian Emergency Departments should be aware of these as a part of optimizing patient care.

Keywords: Choosing Wisely Canada, emergency medicine, relevance

LO28

Innovating for overcrowding: analyzing the impact of a novel emergency physician role on patient flow

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Introduction: Overcrowding in the Emergency Department (ED) results in delays in care, and increased patient morbidity and mortality. Innovative departmental approaches have the potential to make patient flow through the ED more efficient and reduce overcrowding by improving patient throughput. The Calgary zone ED recently piloted a new physician role, the Emergency Physician Lead (EPL), a senior physician working closely with the charge nurse and consulting services to provide physician leadership, and to troubleshoot flow issues and safety breeches such as EMS offload delays and long emergency inpatient (EIP) stays. The objective of this study was to evaluate the efficacy of the EPL by determining its effect on key metrics of patient flow, and by identifying which specific EPL interventions were most effective at improving patient throughput. **Methods:** A retrospective cohort design was used to compare Foothills Medical Centre (FMC) ED patients seen by the EPL from March-June 2019 (n = 1343 patients) with a control group from the same period in 2018 (n = 5530). An EMR search was used to collect patient data and generate descriptive statistics, which were compared between groups by Mann-Whitney U-test. Patient handover notes left by the EPL were also collected and analyzed by two independent assessors to develop a list of actions taken by the EPL. Each patient was then coded based on the actions in the handover note, and means for each coded group were compared to control to find correlations between action and changes in key flow metrics. **Results:** Patients whose care involved the EPL had a 40% shorter average ED length of stay (ELOS) compared to control (515 vs 865 min, p < 0.001). The EPL was especially effective for patients with ELOS above the

90th percentile, with a 58% relative reduction. EPL patients also had lower average times from first contact with the department to first order being placed (79 vs 143 min, p < 0.001), and spent less time as EIPs after being admitted (390 vs 515 mins, p < 0.001). EPL actions aimed at early ordering of investigations or early management showed the largest relative reductions in ELOS, followed by actions related to resolving issues with consulting services (56% and 48% respectively, p < 0.001). **Conclusion:** The EPL role appears to be associated with improvements in several key metrics of patient flow. Specific EPL actions were correlated with marked decreases in length of stay. The EPL may be an effective strategy to improve patient throughput and combat ED overcrowding.

Keywords: flow, overcrowding, throughput

LO29

Interventions at triage to improve emergency department throughput: a systematic review

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Introduction: Emergency Department (ED) crowding is the primary threat to emergency care quality. Input and outflow factors are important factors, but EDs must optimize throughput efficiency by improving internal processes from triage to disposition, and triage is the first throughput phase. Triage throughput interventions exclude strategies that direct patients away from the ED (these modify input rather than throughput). Previous research has described physicians in triage, team triage, telemedical triage, and nurse practitioner (NP) or physician assistant (PA) led triage, but their impact has never been systematically evaluated. **Methods:** We conducted systematic database searches in Medline, Embase, CINAHL, and the Cochrane Central Register of Controlled Trials without the use of filters or language restrictions of all triage interventions that effected ED throughput (PROSPERO:CRD42019125651). Two independent reviewers screened studies. Study quality was assessed using the Cochrane Risk of Bias tool (version 2) for randomized controlled trials, and the National Heart, Lung, and Blood Institute quality assessment tool for other designs. **Results:** 18 studies met inclusion criteria (Cohen's k = 0.69). Study results were not pooled due to high statistical heterogeneity as assessed by chi-squared and I-squared statistics. Studies were grouped into physician led, NP or PA led, and team triage interventions. Six physician in triage interventions reported LOS changes between -82 and +18 minutes. Five NP/PA led triage interventions resulted in LOS changes of -106 to +19 minutes. Five team triage interventions reported LOS reductions of 4 to 34 minutes. One telemedicine triage study reported a non-significant 8 minute increase in LOS. Six physician at triage interventions yielded significant LWBS rate improvement (relative risk {RR}= 0.29-0.82). Team triage interventions generated LWBS rate changes ranging from meaningful improvement (RR = 0.58) to substantial deterioration (RR = 1.68). Five studies have low risk of bias, 11 studies have some risk of bias, and 2 studies have high risk of bias (Cohen's kappa = 0.58). **Conclusion:** Fourteen of 18 triage interventions reduced EDLOS and/or LWBS rate. Physician, NP and PA led triage were the most effective triage interventions. To aid widespread adoption, future research should focus on interrupted time series or RCT designs, and more comprehensive descriptions of the contextual factors affecting implementation of these interventions.

Keywords: crowding, throughput, triage