

**Introduction:** Planning for the future emergency physician (EP) workforce will be a significant challenge for decision makers given the rise in emergency department (ED) visits and no concurrent increase in resident positions. EP workforce planning must incorporate physician supply, as well as current and forecasted patient demand. Nova Scotia has undertaken the process of developing a planning model to support policy decision making. We hypothesize that Nova Scotia will require increased resident positions and recruitment from other provinces to meet future patient demand. **Methods:** We have developed an age structured population model that tracks the number of clinical full-time equivalent (FTE) EPs by their age and shows the “variance” (i.e., supply – demand = variance) over a 30 year planning horizon. This model represents all Level 1, 2, 3, and 4 EDs in Nova Scotia. Current physician supply was calculated based on FTE staffing levels. The current patient demand was based on historical volume and acuity of patients and converted to an FTE demand estimate. Forecasted demand was predicted to increase at an average rate of 0.5% per year. We varied the number of residents trained and the number of EPs recruited from outside the province to examine the effect on the EP workforce. Our initial model will reflect the current training environment and will be referred to as the “current state”. In our 3 scenarios, we increased the number of residents and recruited physicians by 50%, individually and then together. Our outcome measure will be the variance in FTE. **Results:** The current state showed that the province will have a deficit of 51 FTE EPs over the next 30 years. In scenario 1, a 50% increase in both resident training streams eliminated all variance, while in scenario 2, the increase in recruitment reduced the FTE variance to 34 FTE positions unfilled. In scenario 3, the variance was 0. **Conclusion:** We feel that this CTAS weighted volumes perspective is important for clinical services planning but the siting, sizing, and synergizing of EDs in a region will involve other inputs. It is important to recognize that we have made the assumption that all physicians starting to work in Nova Scotia will be a 1 FTE. Future iterations will examine the effect of more realistic FTE definitions that account for administrative, teaching and research activities.

**Keywords:** emergency department staffing, emergency physician, health human resource planning

#### LO78

##### A qualitative evaluation of a mandatory provincial program auditing emergency department return visits

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**Introduction:** The Ontario emergency department (ED) Return Visit Quality Program (RVQP) launched in 2016 and aims to promote continuous quality improvement (QI) in the province’s largest EDs. The program mandates routine audits of cases involving patients who had ED return visits within 72hrs that led to admission to hospital, in order to identify quality issues that can be tackled through QI initiatives. Our objective was to formally evaluate how well the RVQP achieved its aim of promoting continuous QI at participating sites using the constructivist grounded theory. **Methods:** Using a semi-structured interview guide, we employed a maximum variation sampling approach to ensure diverse representation across several geographical and institutional experiences (e.g., urban vs. rural, academic vs. community). Selected RVQP program leads were invited

to participate in a phone interview to yield maximal insight, additionally using a snowball sampling approach to reach non-lead physicians to capture the penetration of the program. Interviews were conducted until thematic saturation was reached and no new insights were gleaned. Interviews were initially cross-performed by two members of the research team, recorded, transcribed, and de-identified. Data analysis was conducted using a constant comparative approach through the development of a coding framework and triangulation with the respondents’ ED setting. We then grouped, compared and refined our analytic categories through an inductive, iterative approach. **Results:** Between June and August 2018, we interviewed 32 participants, including 21 RVQP program leads and 11 non-lead physicians, from a total of 23 diverse sites (out of 84). Our analysis suggests that the RVQP provides a structured method for EDs to frame the continuous collection of data in order to channel activities towards quality improvement projects based on identified needs. Success factors included: greater involvement with QI processes prior to the RVQP leading to more openness to improvement, a more collaborative approach to RVQP implementation which led to greater front-line workers’ understanding and engagement, and more resources dedicated to implementing the RVQP as well as tackling the quality issues it identified. **Conclusion:** This study evaluated the impact of an innovative and large-scale program aimed at improving the culture of quality in Ontario EDs. While the program is still relatively new, early results show that there are key elements of EDs that support building a culture of QI.

**Keywords:** audit & feedback, quality improvement, return visits

#### LO79

##### The impact of access block on consultation time in the emergency department

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**Introduction:** Access block (AB) is the most important indicator of Emergency Department (ED) crowding, but the impact of AB on consultation time has not been described. Our objectives were to determine if ED AB affects inpatient service consultation time, and operational and patient outcomes. **Methods:** We conducted a health records review of all ED patients referred and admitted at a university-affiliated tertiary care hospital over 60-days. A computational algorithm determined hourly ED AB at the time of consultation request, and observational cohorts were determined based on ED AB high (>35% ED bed capacity occupied by admitted patients) or low (<35%). The outcomes included total consultation time (TCT), ED physician initial assessment (PIA) time, ED length of stay (LOS), transfer time to inpatient bed (TTB), hospital LOS, return to ED (RTED) within 30 days, and 30-day mortality. **Results:** We included 2,871 patients (48% male; M = 63 years, IQR 45–78), and the low AB cohort were higher acuity (N = 1,692; 50.4% CTAS 1–2) than the high AB cohort (N = 1,179; 47.1% CTAS 1–2). Median TCT was not significantly different (low = 209min, high = 212min; p = 0.09), and there was no difference in consults completed within the 3-hour institutional time target (low = 41.1%, high = 40.9%; p = 0.89). Median ED PIA time was not significantly different (low = 66min, high = 68min; p = 0.08), however, patients seen within the funding-associated provincial ED PIA time target was significantly less during high AB (high = 82.2%, low = 89.2%; p < 0.001). Median ED LOS was significantly longer during high AB (high = 12.1hr,

low = 11.1hr;  $p = 0.009$ ), but median hospital LOS was not different (high = 109.5hr, low = 112.4hr;  $p = 0.44$ ). Median TTB was significantly longer during high AB (high = 8.0hr, low = 5.9hr;  $p = 0.0004$ ). There was no difference in RTED visits (high = 12.4%, low = 10.6%;  $p = 0.15$ ) or 30-day mortality (high = 8.4%, low = 9.2%;  $p = 0.51$ ). **Conclusion:** In conclusion, consultation time is not affected by AB. However, boarding admitted patients in the ED impairs our ability to meet funding-associated performance metrics. Reducing boarding time should be an ED and hospital-wide priority, as it negatively impacts funding and delays patient care.

**Keywords:** access block, consultation, crowding

### LO81

#### 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, emergency department (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 that application of national triage guidelines across Ontario. The objective of this study was to evaluate triage times and score agreement in ED settings where eCTAS has been implemented. **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 triage time. Interrater agreement was estimated using unweighted and quadratic-weighted kappa statistics with 95% confidence intervals (CIs). **Results:** 1491 (752 pre-eCTAS, 739 post-implementation) individual patient CTAS assessments were audited over 42 (21 pre-eCTAS, 21 post-implementation) seven-hour triage shifts. Exact modal agreement was achieved for 567 (75.4%) patients pre-eCTAS, compared to 685 (92.7%) patients triaged with eCTAS. Using the auditor's CTAS score as the reference standard, eCTAS significantly reduced the number of patients over-triaged (12.0% vs. 5.1%;  $\Delta$  6.9, 95% CI: 4.0, 9.7) and under-triaged (12.6% vs. 2.2%;  $\Delta$  10.4, 95% CI: 7.9, 13.2). Interrater agreement was higher with eCTAS (unweighted kappa 0.89 vs 0.63; quadratic-weighted kappa 0.91 vs 0.71). Research assistants captured triage time for 3808 patients pre-eCTAS and 3489 post implementation of eCTAS. Median triage time was 312 seconds pre-eCTAS and 347 seconds with eCTAS ( $\Delta$  35 seconds, 95% CI: 29, 40 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:** electronic Canadian Triage and Acuity Scale (eCTAS), interrater agreement, triage

### LO82

#### Does triage assignment correlate with outcome for ed patients presenting with chest pain?

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**Introduction:** CTAS triage acuity and CEDIS complaint categories are used to prioritize patients for rapid treatment and ED resource allocation. Our objective was to evaluate CTAS and CEDIS validity for risk stratification of ED patients with chest pain using data from two Canadian cities. **Methods:** This administrative database study included patients seen over a five-year period with a triage complaint of chest pain. Our composite primary outcome included 7-day mortality, cardiac arrest, acute coronary syndrome (ACS) diagnosis (STEMI, NSTEMI, unstable angina{UA}), admission to a critical care unit, or hospitalization with CHF, pulmonary embolism, dysrhythmia, aortic pathology, neurologic or respiratory diagnosis. We dichotomized triage assignments to cardiac vs. noncardiac chest pain and high (CTAS 1,2) vs. low (3,4,5) triage acuity. For our secondary outcome we reported the components of the primary composite outcome. **Results:** We studied 111,824 patients. The most common overall diagnoses were chest pain NYD (53.8%), ACS (8.9%), musculoskeletal (7.4%), and acute respiratory (5.5%) or GI (5.1%) conditions. Of all patients studied, 85,888 (76.8%) were placed in the "cardiac features" group, and 93,257 (83.4%) fell into high acuity CTAS 1-2. Patients triaged into the "cardiac features" group were more likely to have a composite outcome event (16.6% v. 6.7%;  $p < 0.001$ ), to be admitted (21.8% v. 9.0%), to require critical care (6.0% v. 0.7%), to receive an ACS diagnosis (11.3% v. 0.9%), and to die within 7 days (0.5% v. 0.2%). Patients in high acuity triage levels were also more likely to have a composite outcome event (15.8% v. 3.3%;  $p < 0.001$ ), to be admitted (25.4% v. 14.3%), to require critical care (8.2% v. 1.2%), to receive an ACS diagnosis (10.5% v. 0.9%), and to die within 7 days (0.5% v. 0.2%). **Conclusion:** This study shows that triage assignment is strongly correlated with important patient outcomes and that both the chief complaint and acuity level are powerful risk predictors. These findings may differ at other sites and hospitals should assess and evaluate their data.

**Keywords:** chest pain, outcomes, triage

### LO83

#### Quick Refresher Sessions (QRS): improving chest compression training for medical students

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**Innovation Concept:** High-quality cardiopulmonary resuscitation saves lives; however, current certification standards can leave providers poorly prepared to perform effective chest compressions (CCs). We designed a training program based on the emerging model of skill maintenance through frequent short practice sessions. The ideal frequency of training is currently unknown. Our goal was to provide medical students with access to efficient and effective CC training and to determine an optimal training interval. **Methods:** Thirty-six second-year medical students were randomized to three groups that trained at different frequencies: once every two months (q2m) ( $n = 12$ ), once every four months (q4m) ( $n = 13$ ), and control ( $n = 11$ ). Study duration was eight months with the intervention groups, q2m and q4m, participating in five and three sessions respectively. The control group was assessed at study start and end, receiving no training in