

used to track the 'hours' of your shift; 7) A 'Gridlock counter', which tracks how many ED backups or adverse patient outcomes occur ('Gridlocks'). The goal of the game is to work cooperatively with your teammates to complete patient tasks and move patients through the ED to an ultimate disposition (e.g. admission, discharge). The game is won if you finish your shift before reaching the maximum number of 'Gridlocks' allowed. **Conclusion:** Initial responses to GridlockED have been very positive, supporting it as both an engaging board game and potential teaching tool. We are excited to see it validated through research trials and possibly incorporated into emergency medicine training at both student and postgraduate training levels.

Keywords: emergency department flow, simulation, board game

LO14

The CanadiEM Digital Scholars Program: An innovative international digital collaboration curriculum

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Introduction/Innovation Concept: Digital media are a new frontier in medical education scholarship. Asynchronous education resources facilitate a multi-modal approach to teaching, and allows residents to personalize their learning to achieve mastery in their own time. The CanadiEM Digital Scholars Program is a nationwide initiative that provides residents with practical experiences in creating digital educational materials under the supervision of experts in the field. The program allows for collaboration and access to mentorship from top digital educators from across North America. **Methods:** Interested residents accepted into the program spent a period of their PGY4 year completing modules developed in the theory and science behind digital education. Four modules, developed in an iterative process, have been built on the topics of podcasting, blogging, digital identity, and patient communication. Each fellow was supervised members of the CanadiEM team, a faculty member from the resident's home institution, and digital experts from across North America. **Curriculum, Tool, or Material:** The first fellow completed all aspects of the designed curriculum. Above this, he also engaged in blog content creation, initiated research on digital scholarship, and managed the editorial section of CanadiEM. The second fellow is currently halfway through his year (and is expected to complete the program within the year) and has co-authored 30 blog posts and 53 podcasts in 6 months. **Conclusion:** The CanadiEM Digital Scholars Program utilizes a novel approach to foster development of digital educators utilizing experts across North America. We have demonstrated the feasibility and sustainability with our initial pilot years. This program is being scaled next year to include two scholars per year, which will facilitate cross-collaboration between the scholars.

Keywords: innovations in emergency medicine education, social media, free open access education (FOAM)

LO15

Not a hobby anymore: Establishment of the Global Health Emergency Medicine organization at the University of Toronto to facilitate academic careers in global health for faculty and residents
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Introduction/Innovation Concept: Demand for training in global health emergency medicine (EM) practice and education across Canada is high and increasing. For faculty with advanced global health EM

training, EM departments have not traditionally recognized global health as an academic niche warranting support. To address these unmet needs, expert faculty at the University of Toronto (UT) established the Global Health Emergency Medicine (GHEM) organization to provide both quality training opportunities for residents and an academic home for faculty in the field of global health EM. **Methods:** Six faculty with training and experience in global health EM founded GHEM in 2010 at a UT teaching hospital, supported by the leadership of the ED chief and head of the Divisions of EM. This initial critical mass of faculty formed a governing body, seed funding was granted from the affiliated hospital practice plan and a five-year strategic academic plan was developed. **Curriculum, Tool, or Material:** GHEM has flourished at UT with growing membership and increasing academic outputs. Five governing members and 9 general faculty members currently run 18 projects engaging over 60 faculty and residents. Formal partnerships have been developed with institutions in Ethiopia, Congo and Malawi, supported by five granting agencies. Fifteen publications have been authored to date with multiple additional manuscripts currently in review. Nineteen FRCP and CCFP-EM residents have been mentored in global health clinical practice, research and education. Finally, GHEM's activities have become a leading recruitment tool for both EM postgraduate training programs and the EM department. **Conclusion:** GHEM is the first academic EM organization in Canada to meet the ever-growing demand for quality global health EM training and to harness and support existing expertise among faculty. The productivity from this collaborative framework has established global health EM at UT as a relevant and sustainable academic career. GHEM serves as a model for other faculty and institutions looking to move global health EM practice from the realm of 'hobby' to recognized academic endeavor, with proven academic benefits conferring to faculty, trainees and the institution.

Keywords: global health education, global health training, global health research

LO16

Safety and efficiency of emergency physician supplementation in a provincially nurse-staffed telephone service for urgent caller advice

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Introduction: In 2008 British Columbia created a nurse (RN) staffed telephone triage service, (TTS) to provide timely advice to non-911 callers (811). A perception exists that some callers are inappropriately directed to emergency departments (EDs) thereby worsening crowding. We sought to determine whether supplementary emergency physician (EP) triage would decrease ED visits while preserving caller safety and satisfaction. **Methods:** TTS RNs use computer algorithms and judgment to triage callers. Potentially sick callers are directed to "seek care now" (red calls). Often this is to an ED depending on acuity and time of day. In the Vancouver Health Region from April-September 2016 between 8:00-24:00 hours, a co-located EP also spoke with "red" callers to provide further guidance. Callers were followed up with 1 week and satisfaction was evaluated on a 5-point Likert scale. The TTS data was linked to the regional ED database to assess ED attendance within 7 days, and the provincial vital statistics database for 30-day mortality. Our primary outcome was the proportion of unique "red" callers who did not attend the ED compared with a historical cohort one year earlier without EP triage in place. Secondary outcomes were the proportion of "red" callers advised not to attend the ED but (a) attended, (b) admitted, or (c) died. **Results:** In the study period there were 5105 "red" calls of

which 3440 were transferred to the EP (67.4%), 2958 of EP assessed callers (86.0%) had a family doctor, but only one-quarter of such patients could contact their family doctor. Overall, 2301/3440 "red" callers did not attend an ED (67.0%) compared to 2508/4770 in the control period (52.6%), for an absolute reduction of 14.4% (95% CI 12.2 to 16.4%, $p < 0.0001$). In callers for those < 17 years old there was a 20.3% (95% CI 16.5 to 24.1%) reduction in ED visits compared to the control group: 771/1520 (50.7%) vs 364/1067 (30.4%). 40% of callers attending an ED (458/1139) were advised to try non-ED follow up by the MD and 108 (9.5%) were admitted, with no difference in 30-day mortality between groups. Age and CTAS distribution were similar between the two groups and the non MD-transferred cohort. Mean caller satisfaction was excellent (4.7/5.0). **Conclusion:** EP supplementation of a RN advice service has the potential to reduce ED visits by almost 15% while providing excellent safety and satisfaction.

Keywords: input mitigation, telemedicine, emergency department crowding

LO17

A comparative evaluation of ED crowding metrics and associations with patient mortality

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Introduction: Over 700 different input, throughput and output metrics have been used to quantify ED crowding. Of these, only ED length-of-stay (ED LOS) has been shown to be associated with mortality. No comparative evaluation of ED crowding metrics has been performed to determine which ones have the strongest association with patient mortality. The objective of this study was to compare the strength of association of common ED input, throughput and output metrics to patient mortality.

Methods: Administrative data from five years of ED visits (2011-2014) at three urban EDs were linked to develop a database of over 900,000 ED visits with patient demographics, electronic time stamps for care processes, dispositions and outcomes. The data were randomly divided into three partitions of equal size. Here we report the findings from one partition of 253,938 ED visits. The remaining two data partitions will be used to validate these findings. Commonly-used crowding metrics were quantified and aggregated by day or by shift (0800-1600, 1600-2400, 2400-0800), and the shift-specific metrics assigned to each patient. The primary outcome was 7-day all-cause mortality. Multilevel logistic regression models were developed for 7-day mortality, with selected ED crowding metrics and a common set of confounders as predictors. The strength of association between the crowding metrics and mortality was compared using Akaike's Information Criterion (AIC) and the Bayesian Information Criterion (BIC): ED crowding metrics with lower AIC and BIC have stronger associations with 7-day mortality. **Results:** Of 909,000 ED encounters, 124,679 (16.5%) arrived by EMS, 149,233 (19.7%) were admitted, and 3,808 patients (0.5%) died within 7 days of ED arrival. Of input metrics, the model with ED wait-time was better (i.e. had a smaller AIC and BIC) than models for daily census, ED occupancy or LWBS proportion for predicting 7-day mortality. Of throughput metrics, the model with mean ED LOS was better than the model for mean MD care time. Of output metrics, the model with daily inpatient hospital occupancy was better than the model with mean boarding time. **Conclusion:** Based on one data partition, regression models based on the average wait-time, ED LOS and inpatient occupancy best predicted 7-day mortality. These results will be validated in the two other data partitions to confirm the best-performing ED input, throughput and output metrics.

Keywords: emergency department crowding, crowding metrics

LO18

How big is emergency access block in Canadian hospitals?

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Introduction: Emergency department (ED) access block is the #1 safety concern in Canadian EDs. Its main cause is *hospital access block*, manifested by prolonged *boarding* of inpatients in EDs. Hospital administrators often believe this problem is too big to be solved and would require large increases in hospital capacity. Our objective was to quantify ED access gap by estimating the cumulative hours that CTAS 1-3 patients are blocked in waiting areas. This value, expressed as a proportion of inpatient care capacity, is an estimate of the bed hours a hospital would have to find in order to resolve ED access. **Methods:** A convenience sample of urban Canadian ED directors were asked to provide data summarizing their CTAS 1-3 inflow, the proportion triaged to nursed stretchers vs. RAZ or Intake areas, and time to care space. Total ED access gap was calculated by multiplying the number of CTAS 1-3 patients by their average delay to care space. Time to stretcher was captured electronically at participating sites, but time to RAZ or intake spaces was often not. In such cases, respondents provided time from triage to first RN or MD assessment in these areas. The primary outcome was total annual ED access block hours for emergent-urgent patients, expressed as a proportion of funded inpatient bed hours.

Results: Directors of 40 EDs were queried. Six sites did not gather the data elements required. Of 34 remaining, 29 (85.3%) provided data, including 15 tertiary (T), 10 community (C) and 2 pediatric (P) sites in 12 cities. Mean census for the 3 ED types was 72,308 (T), 58,849 (C) and 61,050 (P) visits per year. CTAS 1-3 patients accounted for 73.4% (T), 67.7% (C) and 66.2% (P) of visits in the 3 groups, and 34% (T), 46% (C) and 44% (P) of these patients were treated in RAZ or intake areas rather than staffed ED stretchers. Mean time to stretcher/RAZ care was 50/71 min (T), 46/62 min (C), and 37/59 min (P). Average ED access gap was 47,564 hrs (T), 37,222 hrs (C) and 35,407 hrs (P), while average inpatient bed capacity was 599 beds (5,243,486 hrs), 291 beds (2,545,875 hrs) and 150 beds (1,314,000 hrs) respectively. ED access gap as a proportion of inpatient care capacity was 0.93% for tertiary, 1.46% for community and 2.69% for pediatric centres. **Conclusion:** ED access gap is very large in Canadian EDs, but small compared to hospital operating capacity. Hospital capacity or efficiency improvements in the range of 1-3% could profoundly mitigate ED access block.

Keywords: access block, crowding, efficiency

LO19

Introduction of a regional interactive group supervision tool to maximize multi-program research project support

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Introduction/Innovation Concept: University Departments of Emergency Medicine are responsible for the supervision of research and other scholarly projects for fellows, residents and students, though often lack resources to provide adequate input and oversight. Many departments cover large geographical areas and several programs. We piloted new research committee structures and processes to improve oversight and