

total of 44 ED physicians were analyzed. Results show average 4-year ordering rates for CT heads among ED physicians ranging from 4.0% to 13.9%, and CT PE ordering rates ranging from 0.1% - 1.7%. The correlation coefficient between CT head and CT PE ordering rates was positive for all 4 years, with a statistically significant ( $p < 0.05$ ) correlation coefficient of 0.53. **Conclusion:** There is a wide degree of variability in DI ordering patterns among physicians working within the same clinical environment. Further exploration of this interphysician variability will be helpful in designing strategies to mitigate overutilization of diagnostic imaging.

**Keywords:** diagnostic imaging, physician practice patterns, computer tomography utilization

### P130

#### Cumulative daily boarding time: a new way to measure emergency department congestion and hospital-wide flow

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**Introduction:** Bed boarding of admitted patients in the Emergency Department (ED) is one of the major contributors to ED overcrowding, and an indicator of hospital-wide deficiencies in capacity and flow. Most indicators of ED overcrowding have measured either counts or percentages of patient subgroups (e.g. number/percentage of patients waiting in triage or number/percentage of admitted patients as compared to full ED census), or specific process time intervals related to patient movement through the hospital (e.g. Physician to Initial Assessment (PIA) time or total ED Length of Stay (EDLOS)). We sought to 1) devise an alternative measure of ED overcrowding that captured the dynamic and disproportionate resource utilization of admitted versus non-admitted patients in the ED, and to 2) determine the association of this measure with selected ED quality metrics for non-admitted patients.

**Methods:** We conducted a retrospective multi-centre observational study at three very high-volume community hospitals in the Greater Toronto Area. Data on all patients visiting the ED during the period between January 1, 2015 and December 31, 2016 were included in the study. We calculated the total daily cumulative boarding time - or time to bed (TTB) - for each day of the study duration. The daily cumulative TTB was calculated as the time from decision to admit to transfer from the ED for all admitted patients within a 24-hour period. We conducted linear regression analysis to determine the association between our measured daily cumulative TTB and daily median and 90th percentile PIA and EDLOS times for non-admitted patients. **Results:** Preliminary results for 2015 indicate a total cumulative TTB time ranging from 50,973 hours to 191,093 patient-hours for the year, with daily mean cumulative TTB ranging from 140 524 patient-hours/day among the three hospitals. In all three hospitals, there was a statistically significant ( $p < 0.01$ ) positive association between daily cumulative TTB and both median and 90th percentile PIA times for all patients, and median EDLOS times for non-admitted CTAS 1-3 patients. There was a statistically significant ( $p < 0.05$ ) positive association between daily cumulative TTB and 90th percentile EDLOS for non-admitted CTAS 1-3 patients in two of the three hospitals, with the third hospital showing a positive but non-significant association. **Conclusion:** Bed boarding constitutes a significant resource cost for EDs, and has a negative impact on timeliness of ED care for the general ED population, particularly more complex (CTAS 1-3) non-admitted patients.

**Keywords:** emergency department overcrowding, quality metrics, hospital administration

### P131

#### Antimicrobial stewardship and best practices for the treatment of STIs in ED sexual assault patients

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**Introduction:** It is assumed that sexual assault cases presenting at Emergency Departments (ED) are frequently lost to follow-up and should be considered an eligible population for presumptive antimicrobial treatment of sexual transmitted infections (STIs) at initial assessment without lab confirmation. With the growing burden of antibiotic resistance, antimicrobial stewardship guidelines caution against this practice. Among sexual assault cases, our study evaluated STI prevalence, follow-up and retention patterns, and described the prevalence of STI presumptive treatment. **Methods:** The Sexual Assault and Partner Abuse Care Program (SAPACP) at The Ottawa Hospital is the only program in Ottawa offering emergency and forensic care for survivors of sexual assault and domestic violence. Descriptive statistics were used to summarize information on demographics, clinical presentation, STI testing and results using data from the SAPACP case registry (January 1 - December 31, 2015). **Results:** Among the 406 patients seen by the SAPACP, there were 262 (64.5%) sexual assault cases that were included in this analysis. STI testing was completed for 209 (79.8%) patients at the initial visit, 90 (43.1%) completed via urine nucleic acid testing (NAAT), 140 (67.0%) via culture swab and 20 (9.6%) via both. Laboratory results detected no cases of gonorrhea, 8 (3.8%) cases of chlamydia, 33(15.8%) cases of bacterial vaginosis (BV), 17 (8.1%) cases of yeast vaginitis and 16 (7.7%) indeterminate testing results. Antimicrobial STI presumptive treatment was given to 12 (5.7%) patients at the time of their initial visit prior to lab confirmation. Patient follow-up occurred in 172 (82.3%) patients, with all chlamydia cases treated. Of the 37 (17.7%) patients lost to follow up, 9 were positive for BV, 1 was positive for yeast and 10 were indeterminate, all of which may be underlying vaginal flora. Follow up testing/test of cure was completed in 91 (52.9%) of patients, with 4 (2.3%) positive results, all of which were BV. **Conclusion:** In our ED, up to 15.8% of sexual assault patients had at least one laboratory confirmed STI and over 80% of all patients returned for follow-up. Our results show that it is safe and effective to only treat STI screen positive cases at follow-up, reducing the frequency of presumptive antimicrobial STI treatment. Benefits of this strategy include decreased patient side effects, cost savings and better antimicrobial stewardship.

**Keywords:** sexual assault, sexually transmitted infections, antibiotic stewardship

### P132

#### Real life management of patients presenting with upper gastrointestinal bleeding in a tertiary care emergency department - Are we delivering the standard of care?

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**Introduction:** Upper gastrointestinal bleeding (UGIB) is a common Emergency Department (ED) presentation. Early endoscopic intervention, supported by Glasgow Blatchford Score (GBS) severity, has been shown to reduce re-bleeding rates and lower morbidity and mortality. However, emergent endoscopy is not necessary for all patients. Low-risk patients can be managed with outpatient follow-up. Other important

management decisions such as blood transfusion (Hb <70) and use of proton pump inhibitors (PPI) also warrant evaluation. The aim of this study was to compare the timing and appropriateness of endoscopy and blood transfusion and proton pump inhibitor (PPI) use in a tertiary care setting to the standard of care. **Methods:** A retrospective cohort study was conducted to examine the management of patients presenting with UGIB to the ED in 2016 using a standard chart review methodology. TANDEM and EDIS (Emergency Department Information System) databases were queried to identify patients using specified ICD 10 codes and the CEDIS (Canadian Emergency Department Information System) presenting complaints of vomiting blood or blood in stool/melena. Outcome measures included: patient characteristics, the GBS to determine appropriateness of endoscopic intervention, diagnoses, blood transfusion indications and utilization of oral or intravenous PPIs. Data were entered into a REDCap database and analyzed using standard non-parametric statistical tests. **Results:** A total of 200 patients, 59% male (118/200), mean age 59 years (range 18 - 92 years) were included. The median GBS was 9. 79% of patients (157/200) underwent endoscopy during the hospital visit: 30% of patients with GBS 0-3 (13/43) and 80% patients with GBS 4 (125/157) underwent endoscopy 24 hours. The two most common endoscopic diagnoses were peptic ulcers (39%, 61/157) and varices (18%, 28/157), while 14% (22/157) had a normal diagnosis or mild gastritis. 174/200 patients (87%) were given IV or oral PPI in the ED whereas the remaining 26 (13%) did not receive PPI in hospital. 46% of patients (89/194) received blood transfusion, but only 51% (45/89) were administered based on the 70 g/L threshold while in 40% (36/89) of patients the less restrictive threshold of 90 g/L was used. **Conclusion:** A majority of UGIB patients presenting to a tertiary hospital ED appropriately received endoscopy 24 hours based on a GBS score 4. PPI use was appropriate but a proportion of patients received inappropriate blood transfusions.

**Keywords:** gastrointestinal bleeding, outcomes, management

### P133

**Meteorological predictors of epidemic orthopedic trauma in Calgary**  
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**Introduction:** On March 16 2017, emergency departments and urgent care centres (collectively, EDs) in Calgary saw 3 times the number of fall-related ED visits, and 8 times the number of ED orthopedic consultations and admissions than the daily average for March 2014-2016. Fall-related injuries have significant associated morbidity and burden of disease, as well as cost to the health care system, caregivers and society. The purpose of this study was to use regression analysis to generate best fit models and identify weather and temporal variables which predict the frequency of fall-related ED visits, orthopedic consultations and admissions in winter (November-March). **Methods:** Daily number of ED visits, orthopedic consults, and orthopedic admissions for presenting complaint of Lower Extremity Injury, Upper Extremity Injury, or with an ED diagnosis of Fracture or Fall, were obtained for winter months from November 1 2013 to March 31 2017 from the Alberta Health Services ED database. Weather data was obtained from Environment Canada. Linear and multiple regression were performed to evaluate the predictive value of individual weather and temporal parameters, and derive the best-fitting model to predict the number of ED visits, orthopedic consultations, and orthopedic admissions. **Results:** Individual predictive factors ( $p < 0.05$ ) were month, temperature, overnight temperature drop from  $>0\text{C}$  to  $<0\text{C}$ , day of the week, amount of snow on the ground at 05:00, post-chinook day (chinooks are a warm winter wind in Calgary that can cause large temperature swings), maximum

wind gust speed, and presence of precipitation. The best-fit multi-variable models predicting fall-related ED visits (F-stat = 15.36,  $R^2 = 0.171$ ), orthopedic consults (F-stat = 6.369,  $R^2 = 0.048$ ), and orthopedic admissions (F-stat = 8.658,  $R^2 = 0.126$ ) were statistically significant (probability of F-statistics all  $< 0.0001$ ). **Conclusion:** This study is, to the best of our knowledge, the first to use multiple regression to compute models using weather and temporal variables that can predict fall-related ED visits, orthopedic consults and admissions. This information could be used to alert the population regarding an increased fall and fracture risk ahead of the weather occurrence, as well as municipal snow and ice clearing services, who may be able to mitigate that risk. The ability to predict the frequency of fall-related injuries could enable EDs, EMS, orthopedic services, and hospitals to adjust resource and staffing allocation in anticipation of increases in fall-related injuries.

**Keywords:** orthopedic, weather, fall

### P134

**Escape game as a theatre-based simulation for teamwork skills training in undergraduate medical education**

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**Introduction:** Teamwork skills are essential in emergency presentations. When training medical students to manage acute care cases, simulation is frequently the educational tool. However, simulation content is often medically-focused, and post-simulation debriefs may not prioritize discussion of teamwork skills, as time is limited. Furthermore, debriefing both medical and teamwork aspects of a case may add to the learners cognitive load. This innovation uses an escape game as a non-clinical simulation to gamify teamwork skills training, with a focus on the collaborator CanMEDS role. In the entertainment industry, escape games are activities where teams solve a series of puzzles together to ultimately escape a room. **Methods:** 2 groups of 5 second-year medical students piloted the escape game, created within a simulation theatre, designed to surface teamwork competencies under the four University of Calgary Team Scheme domains (adapted from CIHCs National Interprofessional Competency Framework and Team-STEPPS): Leadership/Membership, Communication, Situation Monitoring, and Collaborative Decision-Making/Mutual Support. During the game, facilitators noted examples of students strengths and challenges in demonstrating teamwork competencies. Post-game, a debrief and written reflective exercise enabled students to analyze successes and challenges in demonstrating teamwork competencies, propose solutions to teamwork challenges, and write 3 goals to improve teamwork skills. All competencies listed under each Team Scheme domain represented themes used in a thematic analysis to uncover students reported teamwork challenges. **Results:** Each escape game is a 30-minute teamwork activity where 5 students collaborate to complete 8 puzzles, which do not require medical knowledge, in order to win. Briefing is scheduled for 15-minutes, whereas post-game debriefing and reflection is 45-minutes. **Conclusion:** Escape games can highlight strengths and challenges in teamwork and collaboration amongst second-year medical students. Every competency under the Team Scheme domains was highlighted by the escape game pilots, touching on both strengths and challenges, for which students demonstrated, debriefed, and reflected upon. Students self-documented teamwork challenges include issues surrounding task-focused, closed-loop communication, and frequent reassessments. Advantages of this innovation include its use as a learning progression towards acute care simulations, portability and affordability, potential interprofessional use, and customizability. Additional training time may be required to orient facilitators to this