atrial fibrillation and flutter (AAFF). We conducted this systematic review to determine whether it is safe to cardiovert AAFF patients without prescribing oral anticoagulation (OAC) post-CV for those who are CHADS-65 negative. **Methods:** We conducted a librarian assisted search of MEDLINE, Embase, and Cochrane from inception through November 23, 2019. We included observational studies and randomized trials reporting thromboembolic (TE) events (i.e. stroke, transient ischemic attack, or systemic thromboembolism) within 30 days following CV in patients with AAFF, where onset of symptoms was <48 hours. Two reviewers independently screened studies and extracted data. The main outcome was risk of TE events within 30 days post-CV, stratified by OAC use. Risk of bias was assessed with the Quality in Prognostic Studies (QUIPS) tool. The primary analysis was based on prospective studies and the secondary analysis was based on retrospective studies. We performed meta-analyses for TE events where 2 or more studies were available, by applying the DerSimonian-Laird random-effects model. We implemented analyses stratified by study design using Open MetaAnalyst and generated the forest plots. **Results:** Our search yielded 969 titles; 74 were selected for full-text review and 20 studies were included in the review. The primary meta-analysis of 6 prospective studies, including two randomized trials, found a TE event rate of 0.15% (2 TE events/1,314 CVs). Within this prospective group, lack of OAC use was associated with a decreased risk of TE events (RR = 2.15 where RR >1 indicates increased risk of TE events with OAC compared to no OAC; 95% CI 0.50 to 9.31; I2 = 0%). Five of the 6 prospective studies had a low or moderate risk of bias in all QUIPS domains. Secondary meta-analysis of 6 retrospective studies revealed a TE event rate of 0.53% (56 TE events/10,521 CVs). This subgroup showed a trend favouring OAC use with decreased risk of TE events (RR = 0.34 where RR <1 suggests decreased risk of TE events with OAC; 95% CI 0.17 to 0.72; I2 = 0%). **Conclusion:** In the primary analysis of prospective studies, we found a low TE event rate following CV of AAFF, irrespective of OAC use. This contradicts previous analyses of retrospective studies. Our study supports the longstanding practice of not necessarily prescribing OAC post-CV in the ED for AAFF patients who are CHADS-65 negative.

Keywords: atrial fibrillation, cardioversion, thromboembolism

PL04

A randomized controlled trial comparing prescribed light exercise to standard management for emergency department patients with acute mild traumatic brain injury

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Introduction: The emergency department (ED) is often the first point of health care contact for patients with mild traumatic brain injury (MTBI). Spontaneous resolution occurs in most patients within 7 days, yet 15-30% will develop post-concussion syndrome (PCS). Given the paucity of effective management strategies to prevent PCS and emerging evidence supporting exercise, the objective of this study was to evaluate the impact of prescribed early light exercise compared to standard discharge instructions for acute MTBI patients in the ED. **Methods:** This was a randomized controlled trial conducted in three Canadian EDs. Consecutive, adult (18-64 years) ED patients with a MTBI sustained within the preceding 48 hours were eligible for enrollment. The intervention group received discharge instructions prescribing 30 minutes of daily light exercise (e.g.,

walking), and the control group was given standard MTBI instructions advising gradual return to exercise following symptom resolution. Participants documented their daily physical activities and completed follow-up questionnaires at 7, 14, and 30 days. The primary outcome was the proportion of patients with PCS at 30 days, defined as the presence of ≥ 3 symptoms on the Rivermead Post-concussion Symptoms Questionnaire (RPQ) at 30 days. **Results:** 367 patients were enrolled (control n = 184; intervention n = 183). Median age was 32 years and 201 (57.6%) were female. There was no difference in the proportion of patients with PCS at 30 days (control 13.4 vs intervention 14.6; Δ1.2, 95% CI: -6.2 to 8.5). There were no differences in median change of RPQ scores (control 14 vs intervention 13; Δ1, 95% CI: -1 to 4), median number of return health care provider visits (control 1 vs intervention 1; Δ0, 95% CI: 0 to 0), or median number of missed school or work days (control 2 vs intervention 2; Δ0, 95% CI: 0 to 1) at 30 days. There was a nonsignificant difference in unplanned return ED visits within 30 days (control 9.9% vs intervention 5.6%; Δ1, 95% CI: -1.4 to 10.3). Participants in the control group reported fewer minutes of light exercise at 7 days (30 vs 35; Δ5, 95% CI: 2 to 15). **Conclusion:** To our knowledge, this is the first randomized trial of prescribed early light exercise for adults with acute MTBI. There were no differences in recovery or healthcare utilization outcomes. Results suggest prescribed early light exercise should be encouraged as tolerated at ED discharge following MTBI, but exercise prescription alone is not sufficient to prevent PCS.

Keywords: concussion, exercise prescription, mild traumatic brain injury

Oral Presentations

LO01

What presenting features predict obstetrical outcomes in women who present to the emergency department with early pregnancy bleeding?

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Introduction: Vaginal bleeding in early pregnancy is a common emergency department (ED) presentation, with many of these episodes resulting in poor obstetrical outcome. These outcomes have been extensively studied, but there have been few evaluations of what variables are associated predictors. This study aimed to identify predictors of less than optimal obstetrical outcomes for women who present to the ED with early pregnancy bleeding. **Methods:** A regional centre health records review included pregnant females who presented to the ED with vaginal bleeding at <20 weeks gestation. This study investigated differences in presenting features between groups with subsequent optimal outcomes (OO; defined as a full-term live birth >37 weeks) and less than optimal outcomes (LOO; defined as a miscarriage, stillbirth or pre-term live birth). Predictor variables included: maternal age, gestational age at presentation, number of return ED visits, socioeconomic status (SES), gravida-para-abortus status, Rh status, Hgb level and presence of cramping. Rates and results of point of care ultrasound (PoCUS) and ultrasound (US) by radiology were also considered. **Results:** Records for 422 patients from Jan 2017 to Nov 2018 were screened and 180 patients were included. Overall, 58.3% of study participants had a LOO. The only strong predictor of outcome was seeing an Intra-Uterine Pregnancy (IUP) with Fetal Heart Beat (FHB) on US; OO rate 74.3%

(95% CI 59.8-88.7; p < 0.01). Cramping (with bleeding) trended towards a higher rate of LOO (62.7%, 95% CI 54.2-71.1; p = 0.07). SES was not a reliable predictor of LOO, with similar clinical outcome rates above and below the poverty line (57.5% [95% CI 46.7-68.3] vs 59% [95% CI 49.3-68.6] LOO). For anemic patients, the non-live birth rate was 100%, but the number with this variable was small (n = 5). Return visits (58.3%, 95% CI 42.2-74.4), previous abortion (58.8%, 95% CI 49.7-67.8), no living children (60.2%, 95% CI 50.7-69.6) and past pregnancy (55.9%, 95% CI 46.6-65.1) were not associated with higher rates of LOO. **Conclusion:** Identification of a live IUP, anemia, and cramping have potential as predictors of obstetrical outcome in early pregnancy bleeding. This information may provide better guidance for clinical practice and investigations in the emergency department and the predictive value of these variables support more appropriate counseling to this patient population.

Keywords: clinical predictors, early pregnancy, vaginal bleeding

LO02

Direct laryngoscopy: is it becoming a lost art in resident education?

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Introduction: Intubation is one of the highest-risk procedures performed in the emergency department (ED) on a regular basis. The British Columbia Airway Registry for Emergencies (BCARE) Network collects data from every ED intubation at two tertiary care centres and one community centre and serves as a valuable quality improvement tool. We compared intubation techniques, success, and complication rates between emergency medicine physicians and trainees. **Methods:** We completed an observational study of all patients intubated in the ED by resident trainees or attending physicians over a period of 28 months from July 2017 to November 2019. Respiratory therapists (RTs) completed a standardized data collection form after every intubation and the data was used to analyze techniques, success, and complication rates. Form completion compliance was periodically reviewed by cross-referencing patient names in the BCARE network with the radiology database for chest x-rays that were performed after intubation in the hospital. **Results:** 642 intubations were performed by EM physicians: 66 by PGY1-2 residents, 141 by PGY3-5 residents, and 435 by staff physicians. Airway assessment prior to intubation was completed by PGY1-2 in 78.1% of cases, PGY3-5 in 67.9%, and staff in 62.6%. Direct laryngoscopy (DL) was chosen as first-choice technique 24.2% by PGY1-2, 24.8% by PGY3-5, and 30.1% by attending physicians. Bougie was used 2.7% of cases for all groups. First-pass success was 78.8% for PGY1-2, 86.5% for PGY3-5, and 85.7% for staff. Mean number of attempts were similar at 1.24, 1.18, and 1.20 for R1-2, R3-5, and staff, respectively. There were similar complication rates between all groups, on average 16.9%, with the most common being hypoxemia prior to induction, and desaturation following induction. There was a higher rate of staff performing second intubation attempts following junior residents (50.0%) than senior residents (26.3%). **Conclusion:** Trainees have a stronger preference to use video laryngoscopy (VL) than staff physicians as their first-line technique. Success rates were similar between senior residents and attending physicians, but significantly lower in junior residents, despite number of attempts being similar between the three groups. Complication rates were similar

among all 3 groups. This data may suggest that a stronger emphasis for DL use among trainees is important.

Keywords: education, intubation, resident

LO03

Prospective comparative evaluation of the ESC 1-hour and a 2-hour rapid diagnostic algorithm for myocardial infarction using high-sensitivity troponin-T

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Introduction: Rapid diagnostic algorithms using high-sensitivity cardiac troponin can rapidly diagnose or exclude acute myocardial infarction (MI). However, multiple algorithms have been proposed and it is unclear if some outperform others. The objective of this study was to prospectively compare the diagnostic performance of 1- and 2-hour algorithms in clinical practice in a Canadian population. **Methods:** Emergency department patients with chest pain had high-sensitivity cardiac troponin-T (hs-cTnT) collected on presentation and 1- and 2-hours later at a single academic tertiary hospital and regional percutaneous coronary intervention site over a 2-year period. The primary outcome was index MI, the secondary outcome was 30-day major adverse cardiac events (MACE). All outcomes were 2 physician adjudicated. **Results:** We enrolled 1,167 patients with hs-cTnT collected on ED presentation. Of these, 350 had a valid 1-hour and 550 had a 2-hour hs-cTnT sample. Index MI prevalence was ~11%. Sensitivity of the 1- and 2-hour algorithms for index MI was 97.3% (95% CI 85.8-99.9%) and 100% (95% CI 91.6-100%) and for 30-day MACE was 80.9% (95% CI 66.7-90.9%) and 83.3% (95% CI 73.2-90.8%), respectively. The 1-hour algorithm was 96.3% specific for index MI (95% CI 93.8-98.2%) whereas specificity for the 2-hour algorithm was 97.9% (95% CI 96.3-100%). Both algorithms classified about one-quarter of patients in an indeterminate observational zone with an ~11% MI prevalence. **Conclusion:** Both the 1- and 2-hour algorithms were highly sensitive and specific for MI, but were less sensitive for 30-day MACE. However, the 2-hour algorithm trended toward better performance, likely because its larger delta cutoffs reduce the risk of misclassification owing to analytic variability. These findings suggest algorithms using larger delta cutoffs may provide a greater margin of safety. Further comparative evaluation of rapid diagnostic algorithms using different cutoffs and characterization of patients in the observational zone is warranted.

Keywords: high-sensitivity troponin, myocardial infarction, rapid diagnostic algorithms

LO04

Decreasing emergency department length of stay for patients with acute atrial fibrillation and flutter: a cluster-randomized trial

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Introduction: CAEP recently developed the acute atrial fibrillation (AF) and flutter (AFL) [AAFF] Best Practices Checklist to promote