be developed. With overwhelming support from physician-educators, a formal pre-clerkship procedural curriculum is poised to redefine the landscape of procedural care for a whole new generation of physicians.
Keywords: pre-clerkship, procedural curriculum, survey

MP43

Evaluation of undergraduate point of care ultrasound instruction in a rural Canadian medical school

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Introduction: Point of care ultrasound is a burgeoning tool in clinical medicine and its utility has been demonstrated in a variety of contexts. It may be especially useful in rural areas where access to other imaging equipment (such as CT) is limited. However, there exists debate about the utility of teaching ultrasound theory and technique to medical undergraduates, particularly those in their first two years of study. This study evaluated the efficacy of teaching undergraduate-tailored ultrasound training sessions to first and second-year medical students at the Northern Ontario School of Medicine (NOSM), a rural-focused medical institution. **Methods**: Sixty students participated in tailored ultrasound teaching sessions that involved both lecture and hands-on components. Participating students were assessed following each session, as well as at study completion, in terms of ultrasound knowledge, anatomy, pathology, orientation, and interpretation of computerized tomography (CT) scans (transferability). Participants' performance was measured against a control group of their peers. Program evaluation was completed using Likert-type scales to determine participant comfort with ultrasound before and after the training, and areas of strength and improvement. **Results**: Participating students showed statistically significant improvement in ultrasound interpretation and anatomical orientation with trends toward improved anatomy and pathology knowledge, and ability to interpret computerized tomography (CT) scans compared to controls. Students participating in the course expressed improved comfort with ultrasound techniques and desire for future integration of ultrasound into their training, but noted that increasing frequency of training sessions might have improved retention and confidence. **Conclusion**: Results suggest that using an undergraduate-focused and system-specific ultrasound training course yields retention in ultrasound interpretation ability and objective improvement in relational anatomy knowledge. Trends toward improvement in general anatomy, pathology and CT interpretation suggest areas of future study.
Keywords: medical education, rural innovation, ultrasound

MP44

Emergency department perceptions of routine in-situ simulation

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Introduction: Emergency Department (ED) health care professionals are responsible for providing team-based care to critically ill patients. Given this complex responsibility, simulation training is paramount. In situ simulation (ISS) has many cited benefits as a training strategy that targets on-duty staff and occurs in the actual patient environment. Several evidence-based frameworks identify staff buy-in as essential for successful ISS implementation, however, the attitudes of interdisciplinary front-line ED staff in this regard are unknown. The purpose of this study is to identify contextual trends in interdisciplinary opinions on routine ISS in the ED. **Methods**: Qualitative and quantitative review, exploring the self-reported attitudes of interdisciplinary ED staff: before, during and after the implementation of a routine ISS pilot program (5 sessions in 5 months) at the Charles V Keating Emergency and Trauma Center in Halifax from Feb-Nov, 2018. **Results**: 149 surveys were received. Baseline support for ISS was high; 83% of respondents believed that the advantages of ISS outweigh the challenges and 47% favoured simulation in the ED, relative the sim bay (26%) and 28% were indifferent. The attitudes of direct participants in ISS were very positive, with 88% believing that the benefits outweighed the challenges after participation and 91% believing that they personally benefited from participating. A department wide post-ISS pilot survey suggested a slight decrease in support. Support for ISS dropped from 83% to 67%, a statistically insignificant reduction ($p = 0.098$) but a sizeable change that warrants further investigation. Most notably respondents reported increased support for simulation training in a simulation bay relative to ISS in the ED. Respondents still regarded simulation highly overall. Interestingly, when the results were stratified by position, staff physicians were the least positive. **Conclusion**: Pre-pilot or baseline opinions of ISS were very positive, and participants all responded positively to the simulations. This study generates valuable insight into the perceptions of interdisciplinary ED staff regarding the implementation and perceived impact of routine ISS. This evidence can be used to inform future programming, though further investigation is warranted into why opinions post-intervention may have changed at the department level.
Keywords: emergency department, in situ simulation, interdisciplinary

MP45

Rate control management of rapid atrial fibrillation in the emergency department

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Introduction: The Canadian Association of Emergency Physicians (CAEP) Atrial Fibrillation (AF) Guidelines prioritizes early cardioversion and discharge home in the management of rapid AF, however not all patients can be safely cardioverted in the emergency department (ED). Given limited ED-based evidence on rate control, we sought to better understand the burden of disease in AF patients not managed by rhythm control and identify opportunities for improved care. **Methods**: We conducted a health records review of consecutive AF patient visits at two Canadian academic hospital EDs over a 12-month period. We included all patients ≥18 years with AF on electrocardiogram, a heart rate ≥100 beats per minute (bpm), and who did not receive cardioversion. Outcomes included: (1) incidence of patients managed by rate control; (2) specific rate control management practices including choice of agent, route of administration, dosing, and timing; (3) adverse events; (4) compliance with CAEP AF Guidelines; and (5) disposition and outcomes. **Results**: Of 972 rapid AF patient visits, 307 were excluded and 665 were included, with mean age 77.2, female 51.6%. Of those included, 43.0% were given rate control medications, most common being metoprolol (72.0%). Admission to hospital occurred in 61.4% of visits, and 77.9% of AF cases were secondary to another medical condition. In

those given rate control medications, 9.1% suffered adverse events and only 55.6% had a final ED heart rate ≤100 bpm. Inappropriate use of rate control medications was found in 44.8% of cases, specifically inappropriate choice of agent (4.5%), inappropriate route of administration (26.9%), over-dosed (2.4%), under-dosed (5.2%), and inadequate timing (5.6%). **Conclusion**: We demonstrated that for rapid AF patients not receiving cardioversion, most cases were secondary to a medical cause and of those receiving rate control, there were a concerning number of adverse events related to inappropriate choice of agent, route of administration, dosage, and timing. Moving forward, better awareness of the CAEP AF Guidelines by ED physicians will ensure safer use of rate control agents for rapid AF patients.
Keywords: atrial fibrillation, emergency department, rate control

MP46

Creatine kinase in the emergency department: antiquated relic or useful adjunct in diagnosis of NSTEMI: A systematic review

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Introduction: The diagnosis of non-ST elevated myocardial infarction (NSTEMI) depends on a combination of history, ECG and cardiac biomarkers. Many hospitals continue to automatically order less sensitive and specific biomarkers such as Creatine Kinase (CK) alongside cardiac Troponin (cTn) as part of an extended panel of bloodwork for work-up of patients with suspected NSTEMI. **Methods**: We undertook a systematic review to assess the usefulness of CK measurements in addition to cTnI in NSTEMI diagnosis. Medline, EMBASE and Cochrane databases were searched from 1995 until May 31, 2018. We added additional articles after reviewing the reference list of pertinent articles and consulting experts. A total of 1123 papers were screened, of which 8 were included in the final analysis. These papers all compared CK and troponin (TnI) testing in the diagnosis of NSTEMI. **Results**: Of the 8 papers included in the analysis none showed CK having a greater sensitivity or specificity than the TnI assays. Furthermore, no paper originally published evidence of CK diagnosing NSTEMI when Troponin was negative. One author, when contacted, described 10% of patients diagnosed with NSTEMI as having discordant data (eg. +CK, -Troponin). However, the outcome data such as angiography and echocardiography were not available for these patients, making definitive diagnosis unclear. **Conclusion**: Troponin has consistently shown to have greater sensitivity and specificity than CK in the diagnosis of NSTEMI with CK adding no improvements in diagnosis. We believe CK should not be used in the emergency department work-up for NSTEMI diagnosis.
Keywords: acute coronary syndrome, creatine kinase, non-ST elevated myocardial infarction

MP47

A systematic review of local complications from central and peripheral administration of vasopressors in the pediatric population

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Introduction: Vasopressors are routinely utilized to treat systemic shock, a significant source of morbidity and mortality in the pediatric population. Local tissue ischemia has been classically implicated with peripheral use of these medications. However, peripheral administration (PVC) has theoretical benefits, and avoids many of the risks associated with central venous catheter (CVC) placement. There appears to be paucity of literature in pediatrics examining this subject. We conducted a systematic review investigating local tissue complications and extravasations of both PVC and CVC administration in the pediatric population. Specifically we examined the type of vasopressor used, the site used, the duration of the infusion, and finally the overall outcome for patients. **Methods**: A systematic search was conducted using PubMed, Embase, Cochrane, and CINAHL databases. Terms for IV administration, specific vasopressor use, complication of interest, and pediatric population were combined. We included studies that satisfied our predetermined criteria. All search results were imported into Covidence software where the primary author conducted an initial title and abstract review. Papers that met the pre-identified criteria were selected for full text review. Papers selected for full text review were independently reviewed by two of the authors. Agreement between the authors was measured utilizing a κ statistic. **Results**: Our search yielded 14784 results, of which 237 were assessed for full text review. The κ between the authors is pending. 13 studies were selected for final inclusion. There were 14 patients with 15 total events. 13 were from PVC use while 2 occurred with CVC's. 11 of the 13 complications associated with PVC administration occurred through extravasation, with 2 events from local ischemia. 9 children were administered dopamine, 1 norepinephrine, and 14 were on multiple vasopressors. 3/13 events were "proximal" or occurring at or above the AC or popliteal fossa while 10/13 events were "distal". The average time to ischemic injury or extravasation peripherally was 56.1 hours with a range of 1.5 to 360 hours. 9 of the total patients did not have any long-term sequelae. One patient had toe amputations, while two others died because of illness. One CVC patient died as a result extravasation leading to asphyxiation. **Conclusion**: There is a lack of significant literature reporting serious adverse events related to peripheral or central administration of vasopressors in the pediatric population.
Keywords: ischemia, pediatrics, vasopressors

MP48

White blood cells count and C-reactive protein performance to identify severe bacterial infection in the fever without a source workup of infants 22 to 60 days old

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Introduction: Identification of severe bacterial infections (SBI) among infants presenting to the emergency department (ED) for fever without a source (FWS) remains challenging. Controversies persist on the usefulness of blood biomarkers, especially when used for assessing infants 22 to 60 days old. Although C-reactive protein (CRP) and white blood cells count (leucocytes) are commonly prescribed, this practice relies on poor and conflicting evidence. Our objective was to determine the performance of those two markers at identifying SBI. **Methods**: This is a sub-analysis of an ongoing retrospective cohort study conducted in an academic pediatric ED in Quebec City, that aims to determine whether a lumbar puncture should routinely be performed in the FWS workup of 22 to 60 days old infants. All consecutive charts of eligible febrile infants were reviewed. Premature infants (<37 weeks), as well as infants with chronic diseases, immunodeficiency, previous antimicrobial therapy, in-dwelling