diagnosis of septic arthritis. Future work should evaluate these diagnostic characteristics in relation to patients with non-infectious monoarticular joint pain.

Keywords: septic arthritis, serum markers, diagnosis

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B-mode point-of-care ultrasound without doppler may help include or exclude significant carotid stenosis in stroke and transient ischemic attack patients - a prospective pilot study

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Introduction: Emergency physicians can use B-mode Point-of-Care Ultrasound (POCUS) to identify a patient's carotid vasculature including the common carotid artery (CCA), and carotid bulb (CB) as well as carotid bifurcation into the internal carotid artery (ICA) and external carotid artery (ECA). Radiology performed carotid ultrasound (RPCU) is performed using both B-mode and spectral Doppler ultrasound, a combination termed "duplex" ultrasound where first arteries are evaluated for stenosis using B-mode ultrasound, which is followed by flow measurements using Doppler. Performing flow measurements using Doppler may add a significant amount of time to the ultrasound, which makes it impractical for an emergency physician in a busy emergency department. Some institutional practices include arranging for outpatient RPCU to assess patients with Transient Ischemic Attack (TIA) and have them follow up in an outpatient TIA clinic. This study explored whether B-mode POCUS without Doppler may help identify Stroke or TIA patients in the emergency department with significant carotid stenosis (CS) by measuring the CCA, CB, and ICA lumen. **Methods:** Adult patients with an emergency physician diagnosis of stroke or TIA who were sent for RPCU were included in this study. An emergency medicine resident in their POCUS fellowship training performed a B-mode POCUS of the patient's right and left CCA, CB and ICA with the patient sitting 90 degrees. Three measurements of each of the 3 sections were obtained and the mean calculated. This was then compared to the results from the RPCU as CS $> 50\%$ or CS $< 50\%$. **Results:** 38 patients were included in the study between February and June 2013. We observed a correlation between absolute differences in comparing the right side of the carotid vasculature to the left side of the carotid vasculature with CS $> 50\%$. Also, in one case, the absolute lumen diameter with B-mode POCUS without Doppler predicted near complete CS which was confirmed on the RPCU. **Conclusion:** B-mode POCUS without Doppler may be useful in identifying patients with CS above and below 50% and may help identify patients who need expedited referrals for CS. However, further research is required before this method can be recommended.

Keywords: point-of-care ultrasound (PoCUS), carotid stenosis

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Exploring the utility of the Hamilton early warning score at triage: pilot study in a Canadian emergency department

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Introduction: Early warning scores (EWS) use vital signs to identify patients at risk of critical events as defined by unplanned intensive care unit (ICU) admission, cardiopulmonary resuscitation (CPR), or death. Systems that combine an EWS with a ICU outreach team can improve hospital survival and cardiac arrest rates. Although initially developed for use in ward patients, evidence suggests that EWS are useful in emergency department (ED) patients and may aid in the earlier identification of sepsis. The Hamilton Early Warning Score (HEWS) was recently developed as part of quality improvement process in our health system. The current study examined HEWS at ED triage among a cohort of patients who experienced a critical event during their hospitalization. HEWS were also evaluated as a predictor of sepsis. **Methods:** Patient were selected from a database of patients admitted to a medical or surgical ward at two tertiary care hospitals over a six-month period. Cases were patients who experienced a critical event during admission and were admitted via the ED. Controls were randomly selected from the database in a two-to-one ratio using an algorithm to match cases based upon burden of comorbid illness. Receiver operator curves (ROC) and likelihood ratios were used to evaluate HEWS at ED triage as a predictor of likelihood of critical deterioration and sepsis. **Results:** The sample included 845 patients of whom 267 experienced a critical event. The median time to occurrence of critical event from admission was 124 hours. ROC analysis indicated that HEWS at ED triage had poor discriminative ability for predicting likelihood of experiencing a critical event 0.63 [95%CI: 0.58-0.67]. HEWS had fair discriminative ability for predicting likelihood of meeting criteria for sepsis 0.75 [95%CI: 0.71-0.80], and good discriminative ability for predicting likelihood of experiencing a critical event among patients meeting criteria for sepsis 0.80 [95%CI: 0.74-0.86]. **Conclusion:** This retrospective study indicates that HEWS at ED triage has limited utility for identifying patients at risk of experiencing a critical event. This may be because deterioration commonly occurred days after admission. However, HEWS may have utility as tool for aiding earlier identification of critically ill septic patients. Prospective studies are needed to further delineate the utility of the HEWS in the ED.

Keywords: triage, early warning scores, sepsis

P121

Does test-enhanced learning improve success rates of ultrasound-guided peripheral intravenous insertion? A randomized-controlled trial

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Introduction: Optimising teaching techniques when introducing learners to new skills such as ultrasound guided peripheral IV insertion (UGPIV) is essential due to the time and resource intense nature of skills learning. The testing effect has been demonstrated to be effective in improving learner retention, however there is little research evaluating the testing effect on the acquisition of technical skills in medicine. This study aims to determine whether test-enhanced learning improves learner performance of UGPIV. **Methods:** A prospective randomized control trial is ongoing with medical students on rotation at Sunnybrook Health Sciences Centre. Participants are randomized to one of two study groups, the control group (CG) and the test-enhanced learning group (TEG). Each group receives a teaching session lasting 1.5 hours surrounding ultrasound guidance for peripheral IV insertion. The TEG receives a formal evaluation of the skill during the last 15 minutes of that session, whereas the CG has continued practice time. Subjects in both groups are being evaluated two weeks later to compare skill performance using an objective structured assessment of technical skills. **Results:** Data collection is ongoing and is expected to be completed with an recruitment of 40 by March 31st. **Conclusion:** Given the importance and resource intensive nature of technical skill training it is important to have an understanding of the most efficient ways to teach new techniques. The results from this study will help provide evidence on the testing effect as a method of improving competency and retention for ultrasound guided procedures.