

MP39**Characteristics of clinical decision support tools that impact physician behaviour: a systematic review and meta-analysis**

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Introduction: Clinical decision support (CDS) has been implemented in many clinical settings in order to improve decision-making. Their potential to improve diagnostic accuracy and reduce unnecessary testing is well documented; however, their effectiveness in impacting physician practice in real world implementations has been limited by poor physician adherence. The objective of this systematic review and meta-regression was to establish the effectiveness of CDS tools on adherence and identify which characteristics of CDS tools increase physician use of and adherence. **Methods:** A systematic review and meta-analysis was conducted. MEDLINE, EMBASE, PsychINFO, the Cochrane Central Register of Controlled Trials and Cochrane Database of Systematic Reviews were searched from inception to June 2017. Included studies examined CDS in a hospital setting, reported on physician adherence to or use of CDS, utilized a comparative study design, and reported primary data. All tool type was classified based on the Cochrane Effective Practice and Organization of Care (EPOC) classifications. Studies were stratified based on study design (RCT vs. observational). Meta-regression was completed to assess the different effect of characteristics of the tool (e.g. whether the tool was mandatory or voluntary, EPOC classifications). **Results:** A total of 3,359 candidate articles were identified. Seventy-two met inclusion criteria, of which 46 reported outcomes appropriate for meta-regression (5 RCTs and 41 observational studies). Overall, a trend of increased CDS use was found (pooled RCT OR: 1.36 [95% CI: 0.97-1.89]; pooled observational OR: 2.12 [95% CI: 1.75-2.56]). When type of tool is considered, clinical practice guidelines were superior compared to other interventions ($p = .150$). Reminders ($p = .473$) and educational interventions ($p = .489$) were less successful than other interventions. Multi-modal tools were not more successful than single interventions ($p = .810$). Lastly, voluntary tools may be superior to than mandatory tools ($p = .148$). None of these results are statistically significant. **Conclusion:** CDS tools accompanied by a planned intervention increases physician utilization and adherence to the tool. Meta-regression found that clinical practice guidelines had the biggest impact on physician adherence although not statistically significant. Further research is required to understand the most effective intervention to maximize physician utilization of CDS tools.

Keywords: clinical decision support tools, emergency medicine technology

MP40**Do doctors cherry pick?**

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Introduction: Physician access to presenting complaint information may lead to cherry picking if some patients are seen as more attractive than others. Our objective was to determine whether chief complaint CC descriptors are associated with differing wait time to MD, hence whether physicians preferentially see patients with selected presenting complaints. **Methods:** We collated administrative data on all Calgary ED patients from 2016. Those in CTAS categories 1 and 5 were excluded, as well as fast track patients (because of single coverage). We described most common chief complaint (CC) categories and their median wait time to MD, adjusted for ED arrival site, patient sex, triage

acuity, and need for admission. **Results:** We studied 128,812 subjects (54% CTAS2, 46% CTAS34) with 56,243 males and 72,569 females. Mean age was 50.6 years ($sd = 20$), and most common CC categories (%) were abdominal pain (22%), chest pain (14.6%), musculoskeletal problems (7.2%), flank pain (5.2%), URI/Fever (4.7%), dyspnea (4.6%), headache (4.6%), and back pain (4.0%). Median TTMD was 84 min and admission rate in the study cohort was 30.4%. Multiple linear regression modeling showed that, in addition to CC category and ED arrival site, CTAS level, female sex, and need for admission changed TTMD by 18.6 min (per CTAS level), 6.6 min, -19.2 min respectively. Based on adjusted TTMD, the least attractive CC categories (adjusted median TTMD) were constipation (104 min), back pain (103), Depression/anxiety (103), abdominal pain (102), and dizziness/sensory disturbance (98); while the most attractive were trauma (44 min), allergic reaction (46), stroke symptoms (49), palpitations (61), and overdoses (66). **Conclusion:** There is a larger than expected difference in waiting times associated with specific chief complaint categories. This has implications for the way that patients are assigned to physicians or perhaps the way that chief complaint data is transmitted.

Keywords: quality improvement and patient safety, wait times, triage

MP41**Validity of the Canadian CT head rule age criterion for mild traumatic brain injury**

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Introduction: With a Canadian aging population, the prevalence of mild traumatic brain injury (mTBI) among elderly is increasing and the age criterion of the Canadian CT head rule (CCHR) is challenged by many emergency physicians. We evaluated if increasing the age criterion of the CCHR would maintain its validity. **Methods:** We conducted an historical cohort study using the medical charts of all patients 65 years old or more who consulted at a Level One Trauma Centre emergency department (ED) for a mTBI between 2010 and 2014. The main outcome measures were clinically important brain injury (CIBI) on Computed Tomography (CT) and the presence of the CCHR criteria. The clinical and radiological data collection was standardized. Univariate analysis was performed to measure the predictive capacities of modified age cut-offs at 70 and 75 years old. **Results:** Out of the 104 confirmed mTBI in this study, 32 (30.8%) had CIBI on CT scan. Sensitivity and specificity [C.I. 95%] of the CCHR were 100% [89.1 - 100] and 0% [0.0 5.0] for an age criterion of 65 years old and above; 100% [89.1 - 100] and 4.2% [0.9 11.7] for a modified criterion of 70 years old; 100% [89.1 - 100] and 13.9% [6.9 24.1] for 75 years old. Furthermore, for an age criterion of 80 and 85 years old, sensitivity was respectively 90.6% [75.0 98.0] and 75.0% [56.6 88.5]. **Conclusion:** In our cohort, increasing the age criterion of the CCHR for minor head injury to 75 years old would benefit ED by further reducing CT scans without missing CIBI. A larger prospective study is indicated to confirm the proposed modification.

Keywords: mild traumatic brain injury, computed tomography, Canadian CT head rule

MP42**Validation of the Stoplight Pain Scale tool in the Canadian emergency setting**

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Introduction: A variety of pain assessment tools exist for children, however none of the current scales were created specifically for family use. Further, none provide direct guidance with regards to pain treatment threshold. This study aimed to validate a novel, three faced, coloured coded (red, yellow, green), family-friendly pain tool, the Stoplight Pain Scale, by comparing it to the widely accepted and validated Faces Pain Scale-Revised (FPS-R). This novel tool has the capability to guide families with regards to treatment, as well as measure pain. **Methods:** A prospective observational cohort study was conducted at the Stollery Childrens Hospital emergency department (ED) (Edmonton, Alberta) from November, 2014 to February, 2017. Demographic information was collected, and patients (3-12 years) and their caregivers were asked to rate their pain using the novel Stoplight Pain Scale as well as the FPS-R. Pain was measured at presentation to the ED, immediately following painful procedures, and thirty minutes after analgesia administration. Patients and their caregivers also indicated their preferred scale for assessing pain. **Results:** A purposeful random sample of 227 patients were included for analyses; 61/227 (26.9%) of patients were 3-5 years old and 166/227 (73.1%) were 6-12 years old. 53/227 (23.3%) of patients had been previously hospitalized. Correlation between the two pain scales was consistently fair to moderate; using Kappa Statistics, a baseline correlation for Stoplight and FPS-R was fair for both caregivers (0.38, 95% CI 0.28-0.48) and patients (0.36 95% CI 0.27-0.45). The Stoplight Pain Scale had fair to moderate correlation between caregiver and patient scores, (0.37, 95% CI 0.27-0.47), compared to FPS-R which showed poor to fair agreement between caregiver and child scores (0.20, 95% CI 0.12-0.29). Regardless of age or hospitalization status, 64% of patients (139/218) and 54% caregivers (118/220) preferred the Stoplight Pain scale ($p=0.001$). **Conclusion:** The Stoplight Pain Scale correlates moderately well with FPS-R, a validated pain assessment tool for children and shows good correlation between patients and caregivers assessment of reported pain. The Stoplight Pain Scale is a simple, easy to administer tool that may have a role in empowering family involvement in ED pain management. Future research should focus on at-home study of the tool. **Keywords:** pain, measurement, self-report

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Evaluation of an innovative web-based educational program to teach the management of alcohol withdrawal

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Introduction: Ideal management of alcohol withdrawal syndrome (AWS) incorporates a symptom driven approach, whereby patients are regularly assessed using a standardized scoring system (Clinical Institute Withdrawal Assessment for Alcohol-Revised; CIWA-Ar) and treated according to severity. Accurate administration of the CIWA-Ar requires experience, yet there is no training program to teach this competency. The objective of this study was to develop and evaluate a web-based curriculum to teach clinicians how to accurately assess and treat AWS. **Methods:** This was a three-phase educational program consisting of a series of 3 e-learning modules of core competency material, in-person seminar to orient learners to high fidelity simulation, and summative evaluation in an OSCE setting using a standardized patient. To determine the ED impact of the AWS curriculum, we recorded how often the CIWA-Ar was appropriately applied in the ED pre and post training, ED length of stay, total dose of benzodiazepines administered in the ED, and number of prescriptions and unit benzodiazepine doses given upon discharge were also recorded. **Results:** 74

nurses from an academic ED completed the AWS curriculum. There were 130 and 126 patients in the pre and post AWS training periods, respectively. Management of AWS was not compliant with CIWA-Ar protocol in 78 (60.0%) and 46 (36.5%) patients pre and post AWS training, respectively (23.5%; 95% CI: 11.3%, 34.7%), resulting in administration of benzodiazepine when it was not required, or not giving benzodiazepines with a CIWA-Ar score of 10. There was an average of 4 CIWA-Ar scores per patient in both the pre and post implementation periods. Prior to AWS training, 144/560 (25.5%) CIWA-Ar scores resulted in a breach of protocol, compared to 64/547 (11.7%) following AWS training (13.8%; 95% CI: 9.3%, 18.3%). Median total dose of benzodiazepines administered in the ED was lower after the implementation of the AWS curriculum (40mg vs. 30mg; 10mg; 95% CI: 0mg, 20mg). ED length of stay and the amount of benzodiazepines given to patients at discharge were similar between groups. **Conclusion:** This AWS curriculum appears to be an effective way to train ED clinicians on the proper administration of the CIWA-Ar protocol, and results in improved patient care.

Keywords: alcohol withdrawal syndrome, emergency department, clinical institute withdrawal assessment for alcohol scale

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TEC4Home heart failure: using home telemonitoring to decrease ED readmissions and clinical flow

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Introduction: Patients with Heart failure (HF) experience frequent decompensation necessitating multiple emergency department (ED) visits and hospitalizations. If patients are able to receive timely interventions and optimize self-management, recurrent ED visits may be reduced. In this feasibility study, we piloted the application of home telemonitoring to support the discharge of HF patients from hospital to home. We hypothesized that TEC4Home would decrease ED revisits and hospital admissions and improve patient health outcomes. **Methods:** Upon discharge from the ED or hospital, patients with HF received a blood pressure cuff, weight scale, pulse oximeter, and a touchscreen tablet. Participants submitted measurements and answered questions on the tablet about their HF symptoms daily for 60 days. Data were reviewed by a monitoring nurse. From November 2016 to July 2017, 69 participants were recruited from Vancouver General Hospital (VGH), St. Pauls Hospital (SPH) and Kelowna General Hospital (KGH). Participants completed pre-surveys at enrolment and post-surveys 30 days after monitoring finished. Administrative data related to ED visits and hospital admissions were reviewed. Interviews were conducted with the monitoring nurses to assess the impact of monitoring on patient health outcomes. **Results:** A preliminary analysis was conducted on a subsample of participants ($n=22$) enrolled across all 3 sites by March 31, 2017. At VGH and SPH ($n=14$), 25% fewer patients required an ED visit in the post-survey reporting compared to pre-survey. During the monitoring period, the monitoring nurse observed seven likely avoided ED admissions due to early intervention. In total, admissions were reduced by 20% and total hospital length of stay reduced by 69%. At KGH ($n=8$), 43% fewer patients required an ED visit in the post-survey reporting compared to the pre-survey. Hospital admissions were reduced by 20% and total hospital length of stay reduced by 50%. Overall, TEC4Home participants from all sites showed a significant