

less have been reported in single centre hospitals, but never in an entire population. QuICR (Quality Improvement and Clinical Research) Alberta Stroke Program aimed to reduce DNT to a median of 30 minutes across the Canadian province of Alberta. **Methods:** We used the Improvement Collaborative Methodology from early 2015 to September 2016 with participation from all 17 Stroke Centres in Alberta. This methodology included 4 face-to-face workshops, site visits, webinars, data collection, data feedback, intensive process mapping, and process improvements. We compared data in the pre-intervention period from 2009-2014 (collected during the Alberta Provincial Stroke Strategy) to data in the post-intervention period from March 2016-February 2017 (collected during the QuICR DTN Collaborative). Data from January 2015-February 2016 were excluded, as improvements were being implemented during this time. **Results:** There were a total of 2,322 treated cases in the pre- and post-intervention periods. The results show that the median DNT dropped from 68 minutes ( $n = 1,846$ ) in the pre-intervention period to 36 minutes ( $n = 476$ ) in the post-intervention period ( $p < 0.001$ ). There were reductions in DNT across all hospital types: median DNT dropped from 63 to 32 minutes in Urban Tertiary Centres ( $p < 0.001$ ), from 73 to 32 minutes in Community with 24/7 neurology ( $p < 0.001$ ), from 85 to 62 minutes in Community with limited/no neurology ( $p < 0.001$ ), and from 74 to 52.5 minutes in rural centres ( $p < 0.001$ ). **Conclusion:** There were 21.5 to 41 minute reductions in median DNT across all hospital types including smaller rural and community hospitals. A targeted multi-site improvement collaborative can be an effective intervention to reduce DNT across an entire population.

**Keywords:** door to needle times, quality improvement, acute stroke

#### MP29

##### Creation of the CAEP Acute Atrial Fibrillation/Flutter Best Practices Checklist

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**Introduction:** Patients with acute atrial fibrillation or flutter (AAFF) are the most common acute arrhythmia cases requiring care in the ED. Our goal was to adapt the existing Canadian Cardiovascular Society (CCS) AF Management Guidelines into an emergency physician-friendly best practices checklist. **Methods:** We chose to adapt, for use by emergency physicians, existing high-quality clinical practice guidelines (CPG) previously developed by the CCS using the GRADE system. We used the Canadian CAN-IMPLEMENT© process adapted from the ADAPTE Collaboration. We created an Advisory Committee consisting of 14 academic and community emergency physicians, three cardiologists, one PhD methodologist, and two patients. The Advisory Committee communicated by a two-day face-to-face meeting, teleconferences, and email. The checklist was prepared and revised through a process of feedback and discussions through ten iterations until consensus was achieved. We then circulated the draft checklist for comment to approximately 300 emergency medicine and cardiology colleagues whose written feedback was further incorporated into the final approved version. **Results:** The final CAEP ED AAFF Guidelines are comprised of two algorithms and four sets of checklists, organized by 1) Assessment and Risk Stratification, 2) Rhythm and Rate Control, 3) Long-term

Stroke Prevention with the CHADS-65 Algorithm, and 4) Disposition and Follow-up. The guidelines have been endorsed by CAEP and accepted for publication in the Canadian Journal of Emergency Medicine. During the consensus and feedback processes, we addressed a number of issues and concerns. We highlighted the issue that many unstable patients are actually suffering from underlying medical problems rather than a primary arrhythmia. One controversial recommendation is to consider rate control or transesophageal echocardiography guided cardioversion if the duration of symptoms is 24-48 hours and the patient has two or more CHADS-65 criteria. We emphasize the importance of evaluating long-term stroke risk by use of the CHADS-65 algorithm and encourage ED physicians to prescribe anticoagulants where indicated. **Conclusion:** We have created the CAEP AAFF Best Practices Checklist which we hope will standardize and improve care of AAFF patients in all EDs across Canada. We believe that most of these patients can be managed rapidly and safely with ED rhythm control, early discharge, and appropriate use of anticoagulants.

**Keywords:** atrial fibrillation, guidelines, cardiology

#### MP30

##### Impact des bicarbonates sur le devenir des patients souffrant d'un arrêt cardiaque préhospitalier

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**Introduction:** Les patients souffrant d'un arrêt cardiaque extra hospitalier (ACEH) sont fréquemment traités à l'aide de soins avancés en réanimation cardiovasculaire (SARC). Dans ce contexte, des bicarbonates de sodium sont parfois administrés à des patients en arrêt cardiaque réfractaire chez qui une acidose métabolique importante, une hyperkaliémie ou une intoxication est suspectée. Puisqu'il n'y a que peu de données quant à cet usage, l'objectif de la présente étude est d'évaluer l'association entre le traitement à l'aide de bicarbonate de sodium (une dose ou plus) et le devenir (retour de circulation spontané et survie au congé) chez les patients souffrant d'un ACEH. **Methods:** La présente étude de cohorte a été réalisée à partir des bases de données de la Corporation d'Urgences-santé dans la région de Montréal entre 2010 et 2015. Les patients adultes ayant souffert d'un ACEH d'origine médicale traités en préhospitalier par des paramédics de soins avancés prodiguant des SARC ont été inclus. Les associations d'intérêt ont été évaluées initialement à l'aide de régressions logistiques univariées, puis à l'aide de régressions logistiques multivariées ajustant pour les variables socio-démographiques et cliniques pertinentes. **Results:** Un total de 1973 patients (1,349 hommes et 683 femmes) d'un âge moyen de 66 ans ( $\pm 17$ ) ont été inclus dans cette étude, parmi lesquels 77 (3,8%) ont reçu une dose de bicarbonate, 763 (37,5%) ont retrouvés un pouls en pré-hospitalier et 222 (10,9%) ont survécu jusqu'à leur congé de l'hôpital. Sans ajustement, il y avait une association négative entre le traitement à l'aide de bicarbonates et le retour de circulation spontané (rapport de cotes [RC]=0,46 [intervalle de confiance {IC} 95% 0,27-0,79],  $p = 0,005$ ) et la survie au congé (RC=0,21 [IC 95% 0,05-0,86],  $p = 0,030$ ). Cependant, ces associations n'étaient plus significatives suite à l'ajustement pour les autres covariables (RC ajusté=0,63 [IC 95% 0,34-1,18],  $p = 0,15$  et RC ajusté=1,69 [95% IC 0,29-10,01],  $p = 0,56$ ). **Conclusion:** Il n'y a pas d'association indépendante entre le traitement à

laide de bicarbonates et le devenir chez les patients souffrant d'un ACEH. Dans ce contexte, il serait adéquat de réaliser un essai clinique afin de trancher définitivement sur cette question.

**Keywords:** out-of-hospital cardiac arrest, sodium bicarbonate

### MP31

#### Debriefing critical incidents in health care: a review of the evidence

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**Introduction:** Emergency health care providers (HCPs) regularly perform difficult medical resuscitations that require complex decision making and action. Critical incident debriefing has been proposed as a mechanism to mitigate the psychological effect of these stressful events and improve both provider and patient outcomes. The purpose of this updated systematic review is to determine if HCPs performing debriefing after critical incidents, compared to no debriefing, improves the outcomes of the HCPs or patients. **Methods:** We performed a librarian assisted systematic review of OVID Medline, CINAHL, OVID Embase and Google Scholar (January 2006 to February 2017) No restrictions for language were imposed. Two investigators evaluated articles independently for inclusion criteria, quality and data collection. Agreement was measured using the Kappa statistic and quality of the articles were assessed using the Downs and Black evaluation tool. **Results:** Among the 658 publications identified 16 met inclusion criteria. Participants included physicians, nurses, allied health and learners involved in both adult and pediatric resuscitations. Findings suggest that HCPs view debriefing positively ( $n=7$ ). One moderate quality study showed that debriefing can enhance medical student and resident knowledge. Several studies ( $n=8$ ) demonstrated at least some improvement in CPR and intubation related technical skills. Debriefing is also associated with improved short term patient survival but not survival to discharge ( $n=5$ ). Two studies reported benefits to HCPs mental health as evidenced by improved ability to manage grief and decreased reported symptoms of Post-Traumatic Stress Disorder (PTSD). **Conclusion:** We found HCPs value debriefing after critical incidents and that debriefing is associated with improved HCP knowledge, skill and well-being. Despite these positive findings, there continues to be limited evidence that debriefing significantly impacts long term patient outcomes. Larger scale higher quality studies are required to further delineate the effect of structured debriefing on patient and provider outcomes.

**Keywords:** debrief, resuscitation, emergency service, hospital

### MP32

#### Paramedics using near-infrared spectroscopy in out-of-hospital cardiac arrest: a feasibility study

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**Introduction:** Long-term outcomes following out-of-hospital cardiac arrest (OHCA) remain poor. Two-thirds of OHCA patients surviving to hospital admission die from neurological injuries, and of those discharged, one-third have irreversible cognitive disabilities due to cerebral ischemia. Near-infrared spectroscopy (NIRS) is a non-invasive imaging technique which is able to continuously detect regional cerebral oxygenation (rSO<sub>2</sub>). NIRS monitoring has been used to measure rSO<sub>2</sub> during in-hospital cardiac arrest resuscitation. Our study is the first feasibility study of paramedics applying NIRS monitoring during

OHCA resuscitation. **Methods:** One NIRS monitor (Equanox 7600; Nonin, Plymouth, MI, USA) was placed on an Emergency Response Unit (ERU) with York Region Paramedic Services. ERU paramedics were trained to apply the device to patients foreheads during OHCA resuscitation and record rSO<sub>2</sub> until arrival at hospital or termination of resuscitation. Paramedics did not alter any aspect of patient care by using the NIRS monitor. They were instructed to press an action marker on the device during ACLS interventions (e.g. defibrillation, intubation, medications, etc). rSO<sub>2</sub> data was later downloaded for analysis. Our feasibility criteria was to obtain >70% of data files with rSO<sub>2</sub> data and >70% of data files with event markers. **Results:** Data was collected from 24 OHCA patients over a period of 10 months. 19 cases (79%) files contained rSO<sub>2</sub> data and 17 cases (71%) had event markers. The rSO<sub>2</sub> data present in each file varied widely from complete recording for the entire call duration to sporadic brief readings. Event markers varied from 1 to 10 markers spaced throughout the cases. **Conclusion:** This is the first study to demonstrate that the use of NIRS by paramedics as part of OHCA resuscitation is feasible. Future studies are required to determine how rSO<sub>2</sub> monitoring can be used to guide OHCA resuscitation. The results of this study will help inform protocols for future studies evaluating the use of NIRS in the out-of-hospital setting.

**Keywords:** out-of-hospital cardiac arrest, cerebral oxygenation, feasibility

### MP33

#### Refining nursing symptom-driven guidelines for ED laboratory test ordering

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**Introduction:** Recent reports suggest that up to 30% of medical interventions provide no benefit to patients. In a response to ED overcrowding, guidelines commonly exist to guide blood test ordering in patients waiting to see a physician. In many cases, this increases the use of tests without benefiting patients. We describe a quality improvement project designed to reduce the number of laboratory tests considered routine for waiting patients. **Methods:** A multidisciplinary group reviewed existing symptom-prompted nursing blood test guidelines for serum electrolytes and glucose, renal function tests, liver tests, lipase, toxicological tests and beta Human Chorionic gonadotrophin levels. Order sets were revised with tests eliminated from the routine panels that were not felt to routinely contribute to patient care. The new guidelines were communicated to nursing staff in a series of educational sessions, and the revised guidelines were posted at nursing stations. Physician ordering practice was not changed. A pre-post evaluation compared the period 1 December 2014 - 30 November 2015 with 1 December 2015 - 30 November 2016. Clinical outcomes and patient wait times were not evaluated. **Results:** The use of tests in these categories decreased 32% between the two periods, at a net saving of \$210,246. The largest savings came from total protein (73% decrease), Creatine kinase (68%), chloride (64%), glucose (49%), and albumin (47%). Sodium/Potassium testing decreased by only 13%. The only increase in test ordering recorded was AST (3% increase). **Conclusion:** Simply changing symptom driven order sets resulted in significant savings to the system. In the era of Choosing wisely regular review of lab order sets is indicated. Further study is needed to assess the effect of these changes on patient flow and on clinical outcome.

**Keywords:** Choosing Wisely, emergency laboratory testing