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2019 Air Medical Transport Conference Scientific Assembly Abstracts

The following pages feature the presentations accepted for the 2019 Air Medical Transport Conference in Atlanta, GA. The presentations are alphabetized by title; otherwise, they appear as provided by the Association of Air Medical Services. Contact AAMS at (703) 836-8732 for more information.

Effect of Suction Assisted Laryngoscopy Airway Decontamination (SALAD) Training on Intubation Quality Metrics

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Introduction: VCU Health Critical Care Transport Network paramedics and nurses staff three rotary-wing aircraft and one ground ambulance that provide scene response and interfacility transports throughout Virginia. Prehospital rapid sequence induction and intubation are among the highest risk procedures employed by these providers, particularly when the airway is massively contaminated with blood or vomit. A quality assurance review of attempted prehospital intubations determined issues with suction to be a key factor in those requiring more than one attempt. A targeted training session introducing Suction Assisted Laryngoscopy and Airway Decontamination (SALAD) was implemented and quality improvement data collected.
Methods: SALAD was introduced during scheduled quarterly training. In attendance were 15 nurses and 10 paramedics for a total of 25 participants. With no prior notice, training or cognitive priming each participant attempted intubation using videolaryngoscopy on a custom high fidelity training mannequin designed to emit 650 ml per minute of simulated vomit into the airway. Following their first attempt, participants were instructed on SALAD technique by an EMS-fellowship trained emergency physician. Participants then had another opportunity to intubate the mannequin using SALAD technique. Data was collected on number of attempts and time to successful intubation before and after training.
Results: Mean time to successful intubation improved from 68.28 seconds to 49.76 seconds (95% confidence interval [CI], -34.976 to -2.064; P = 0.0282). There was a trend toward improvement in mean number of intubation attempts overall from 1.12 per participant to 1.0 (CI, -0.0135 to 0.2535; P = <0.0001). Subgroup analysis, however, found there to be significant improvement for participants whose first attempt time was greater than 91 seconds, from a mean of 127.40 seconds to 53.80 seconds (CI, -116.674 to -30.526; P = 0.043) and 1.6 attempts per participant to 1.0 (CI, -1.165 to -0.0349; P = 0.0400) post intervention.
Conclusion: In a controlled environment, SALAD training improves both first pass success and total time to successful intubation. The greatest improvement was observed in the group with the most difficulty and longest time to intubation prior to the targeted educational intervention. This indicates that the introduction of an effective, standardized suction technique for massively contaminated airways can significantly improve quality metrics for intubation by prehospital providers. Further research is needed to determine skill retention and generalizability to an uncontrolled environment.

The Glucose Connection: Field Hyperglycemia as an Early Predictor of Hypotension in Trauma Patients

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Introduction: Trauma is the fourth leading cause of death overall for all ages and identifying a preemptive surrogate parameter that indicates impending shock would allow for optimization of prehospital care.Stress induced hyperglycemia (SIH) occurs secondary to critical illness or injury. Research indicates that SIH is a predictor of mortality in critically ill patients. Multiple studies have indicated a positive correlation between admission hyperglycemia and hypotension in trauma patients. The purpose of this retrospective chart review study is to evaluate the utility of prehospital point of care glucose as an independent predictor of hypotension in the adult trauma patient.
Methods: The primary study objective was to determine if point of care glucose measurement during prehospital transport is predictive of hypotension (systolic blood pressure < 90 mmHg) prior to arrival at the receiving trauma center. A total of 107 patients met inclusion criteria. The primary analysis was a receiver operating characteristics curve, (ROC curve) for the blood glucose diagnostic for predicting hypotension outcome with 95% confidence for the area under the curve and non-parametric comparison to 0.5. The optimal diagnostic cutoff point was determined using Youden's J and 95% confidence intervals for sensitivity and specificity.
Results: There were a total of 1623 trauma transports for the programs in 2018. Our final sample was 107 trauma patients. There were n=22 (20.6%) who had hypotensive systolic BP values (systolic BP < 90) upon arrival at the receiving facility. The ROC diagnostic determined that glucose >= 220 and had a 2.95 increased relative risk of hypotension if the patient's point of care glucose was >= 220. Patients with a glucose >= 220, the systolic blood pressure decreased an average of 13.5 mm Hg. A glucose < 220 demonstrated an increased systolic blood pressure of 0.26 mmHg.

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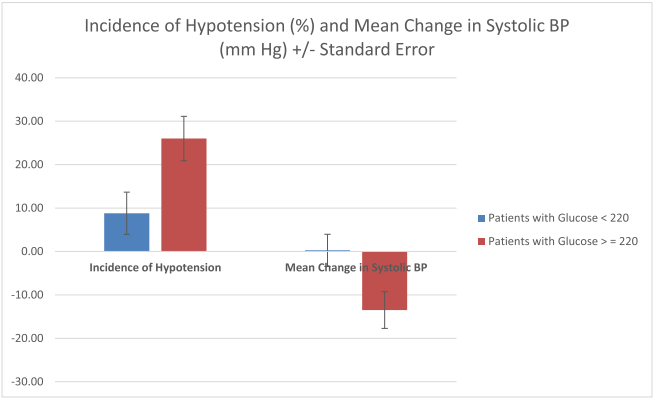
Conclusion: In prehospital trauma patients, point of care glucose measurements greater than 220 predicted a nearly threefold increase in hypotension prior to arrival at the trauma center. Prehospital point of care glucose measurements are simple, rapid, and inexpensive and may help to identify those patients requiring aggressive resuscitation prior to arrival to the receiving trauma facility.



Improving Transport Safety by Limiting Driver Duty Hours Utilizing Simulation to Optimize Team Schedules

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Introduction: Creating and sustaining a safe transport environment is crucial to the medical transport industry. Fatigue is a well-described safety risk for pilots and commercial drivers. The aviation industry has developed strict guidelines to reduce such risks. Currently, similar guidelines do not apply to EMS drivers. To improve safety we applied the same commercial truck driver duty hour limits to EMS drivers. To minimize the impact this had on our team availability we developed a computer-based simulation to optimize our team schedules.
Methods: The Nationwide Childrens Hospital Critical Care department implemented a plan/do/study/act (PDSA) cycle to address policy and process changes to decrease driver duty hours to 14 hours. We first implemented a policy for drivers to decline trips that would put them over their 14-hour duty limit. We then provided guidelines to standardize the decision making process. We worked with a research team from Ohio University to assist in addressing scheduling needs. The research team designed a simulation model to represent the volume, modes, origins, and destinations of our historic critical care transport data.
Results: We decreased the number of trips that exceeded the driver duty limits from six in 2017 to zero in 2018 after implementing the new policy and tools. The simulation data many schedule combinations to consider. Some of these schedule combinations were not during 'normal working hours'. Therefore, we selected the top five scheduling options that maximized team performance and were not drastically different from our current day/night schedule. We looked at scheduling drivers separately from team members and there was no measurable improvement so we did not pursue this scheduling option further.
Conclusion: Safety must always be our top priority in transport for our patients and crew. Implementing a driver duty hour policy was an important step in address safety issues related to driver fatigue when the risk is highest at the end of a long shift. Implementing a simulation tool allowed us to test scheduling combinations that would allow us to minimize times our team would be required to work over there expected shift and maximize the availability of our team.

The SHOCK of Sepsis

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Introduction: This poster presentation discusses facts and statistics regarding sepsis, as well as the importance of early recognition including signs and symptoms, and the importance of early treatment for decreased mortality in the pediatric population
Methods: The poster highlights several statistics regarding sepsis in the pediatric population. The poster also stresses the importance of early recognition and predisposition of sepsis. Early treatment is of utmost importance to decrease mortality in the pediatric population.
Results: The attendee will be able to understand that early recognition and treatment is of the utmost importance in decreasing the mortality in pediatric population. The attendee will also be able to identify several predisposition factors that may contribute to the development of sepsis.
Conclusion: In conclusion, the attendee will have a better understanding of the signs and symptoms of sepsis, the importance of early recognition and timely treatment to decrease the mortality due to sepsis in the pediatric population.

A Systematic Approach to Ventilator Management for the Pediatric Patient during Air Medical Transport

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Objective: A checklist was developed to improve the ventilator management of pediatric patients for AeroCare. Aims: Reduce the percentage of patients outside recommended parameters (no bag-valve mask use, SpO2 level > 90%, and EtCO2 level >35 and <50 mmHg) from 41.3% to 20% within seven months.
Methods: The checklist was developed based on recommended guidelines. After checklist orientation, its effectiveness was analyzed via chart review for patients meeting inclusion criteria (> 5 kg and < 18 years) from July 2018 to January 2019. Parameters identified in the aim statement were used to evaluate effectiveness. Post-transport, a Likert survey concerning the value of the checklist was distributed.
Results: Significant improvements in pediatric ventilator management were noted when teams used the checklist. The rate outside of aim parameters was reduced significantly from 41.3% (N = 92, June 2012 to May 2018 pre-intervention) to 10% (N = 20, July 2018 to January 2019 post-intervention) after the improvement action was implemented (X2= 7.01, p = .008). The 5-point Likert survey results (N = 38, 4.68 +/- .57) supported teams' improved comfort post-checklist implementation.
Conclusion: The checklist improved ventilator management proficiency of pediatric patients and the comfort level of AeroCare teams providing the care.