Impact of the Implementation of a Critically Ill Patient Bundle of Care on the Performance of Key Medical Intervention for Respiratory Distress Patients in the Field

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INTRODUCTION

- Bundles of care have been advocated as a process based system to improve patient care and outcomes using evidenced based guidelines.
- In hospital care bundles have been developed for critical care conditions such as Sepsis.
- Prehospital data shows better patient outcomes when critical ALS interventions are accomplished in the field (1)

Objective: To assess the effectiveness of the implementation of a Prehospital "Crashing Patient" Critical Intervention Bundle of Care on the performance of key prehospital interventions for patients presenting with respiratory distress.

Hypothesis: The implementation of a Prehospital "Crashing Patient" Critical Care Bundle would improve execution of core ALS interventions for patients presenting with respiratory distress and decrease the incidence of post EMS contact cardiac arrest for these patients.

METHODS

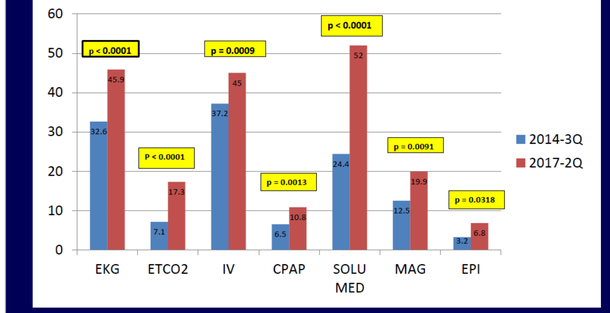
- Urban all ALS municipal (third service) EMS system.
- 63, 000+ responses per year
- Crashing Patients Program fully implemented in 2014 with a variety of continuing educational methods
- Retrospective review of electronic PCRs (EMS Charts ®) coded as "Respiratory Distress" from July 2014 – June 2017)
- Core interventions measured for all cases. For patients receiving a Albuterol® or Atrovent®, administration of Solu-Medrol ®, Magnesium & 1:1000 Epinephrine were measured

Disclosures

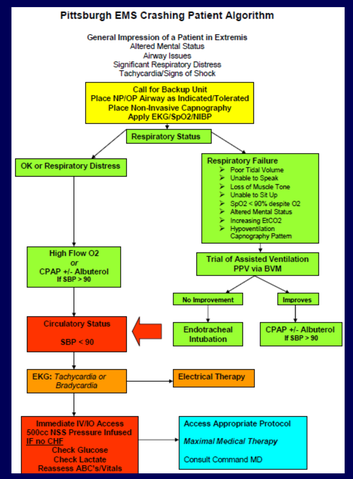
None

TABLES & RESULTS

Graph 1: Core Interventions for Bronchospasm 3rd Quarter 2014 – 2nd Quarter 2017



Pittsburgh EMS Crashing Patient Algorithm



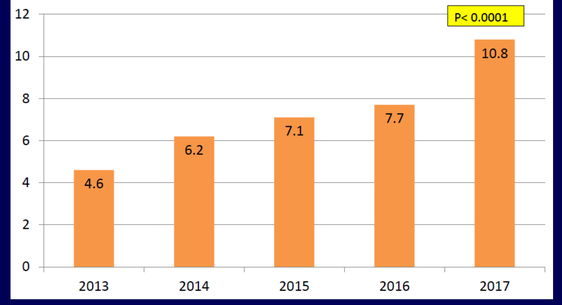
BRONCHOSPASM - ASTHMA

MILD/EARLY	MODERATE	SEVERE
• SpO2, ETCO2, BP, EKG • DuoNeb • Repeat albuterol as needed • IV access • Monitor for improvement or worsening	• SpO2, ETCO2, BP, EKG • DuoNeb • Repeat albuterol as needed • IV access • IV SoluMedrol 125mg • Monitor for improvement/worsening • Transition to CPAP if needed • Move to severe column if needed	• SpO2, ETCO2, BP, EKG • Early CPAP • BVM if AMS • Continuous bronchodilators • Early IM Epinephrine 0.3mg 1:1000 • IV access • IV SoluMedrol 125mg • IV Magnesium 2g over 10min • Ventilate/intubate if no improvement or worsening

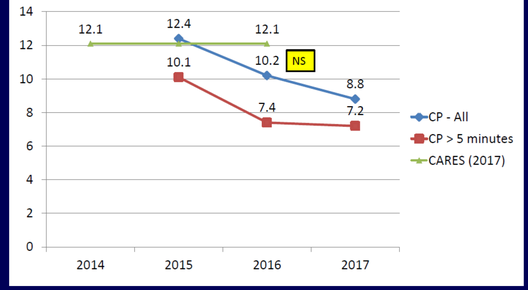
COPD EXACERBATION STRATEGY

MILD	MODERATE	SEVERE
• SpO2, ETCO2, BP, EKG • DuoNeb • Repeat albuterol as needed • IV access • Monitor for improvement/worsening	• SpO2, ETCO2, BP, EKG • DuoNeb • Repeat albuterol as needed • IV access • IV SoluMedrol 125mg • Monitor for improvement/worsening • Transition to CPAP if needed • Move to severe column if needed	• SpO2, ETCO2, BP, EKG • Early CPAP • BVM if AMS • Continuous bronchodilators • IV access • IV SoluMedrol 125mg • IV Magnesium 2g over 10min • Ventilate/intubate if no improvement or worsening • Severe Sx for pts that are headed toward intubation. Consult MD

Graph 2: Percentage of Respiratory Distress Patients Treated with CPAP



Graph 3: Post EMS Contact Cardiac Arrest Cases (% of Total Arrests)



Significant increases in all core performance measures for bronchospasm

- Significant increase in the use of CPAP over time: from every 22nd patient to every 9th
- Decrease in the overall incidence of post EMS Contact Cardiac Arrest over time and compared to the incidence reported in CARES, however this was not statistically significant.(2)

CONCLUSIONS

Implementation of a Prehospital Critical Care "Crashing Patient" Care Bundle resulted in:

- Significant increases in application of EKG & EtCO2 monitoring
- Significant increase in obtaining IV access
- Significant increase in use of CPAP
- Significant increases in is administration of Solu-Medrol ®, Magnesium & 1:1000 to patients in bronchospasm
- A reduction in the incidence of post EMS contact cardiac arrest, however this was non-significant

Critical Care Patient Care Bundles may have significant utility to improve patient care and safety in the prehospital setting

LIMITATIONS

- Retrospective data review that did not take into account the initial severity of patient presentation
- No data on effect on patient outcome outside of incidence of post EMS contact cardiac arrest

FUTURE DIRECTIONS

- Data analysis based on severity of initial patient presentation
- Effects of interventions on specific patient outcome parameters

REFERENCES

1. "Advanced Life Support for Out –of-Hospital Respiratory Distress", Stiell et al., *The New England Journal of Medicine.* Web 2 July 2016.
1. "2016Presumed Cardiac National Summary Report." *CARES*. N.p., 14 Apr. 2016. Web. 5 Sept. 2017.