Eagles 2011

PRESSURE TO SUCCEED:

DOES PREHOSPITAL CPAP AVOID DRUG FACILITATED INTUBATION

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Objectives

- To determine if the implementation of CPAP would result in a decrease in drug facilitated intubations
Out of Hospital Continuos Positive Airway Pressure Ventilation vs Usual Care in Acute Respiratory Failure: A Randomized Controlled Trial

- Thompson et al
- Annals Emerg Medicine 2008: 53(3)232-241
Inclusion Criteria

- **Inclusion**
  - Severe Respiratory Distress
  - Accessory muscle use
  - Respiration Rate $> 25$
  - Hypoxia

- **Exclusion**
  - Respiratory Arrest
  - RR $< 8$
  - Period's of apnea
# Results

<table>
<thead>
<tr>
<th></th>
<th>Intubated</th>
<th>Mortality</th>
</tr>
</thead>
<tbody>
<tr>
<td>Usual Care</td>
<td>17/34 (50%)</td>
<td>12/34 (35%)</td>
</tr>
<tr>
<td>CPAP</td>
<td>7/35 (20%)</td>
<td>5/35 (14%)</td>
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</tbody>
</table>
Houston CPAP Deployment

- CPAP Deployment
- April 1, 2007

- Persse JEMS 2007
### Houston CPAP Implementation Outcome

<table>
<thead>
<tr>
<th>Dates</th>
<th>Intubations</th>
<th>Relative Change</th>
</tr>
</thead>
<tbody>
<tr>
<td>April 1, 2005 to March 31, 2007</td>
<td>3279</td>
<td></td>
</tr>
<tr>
<td>April 2, 2007 to March 31, 2009</td>
<td>2719</td>
<td>-18%</td>
</tr>
</tbody>
</table>
Methods

- Multnomah County EMS AMR Database
  - All incidents where “drug assisted intubations” were used (succinylcholine, etomidate, vecuronium)
  - “Primary Impression” field was used to categorize the clinical presentation
Multnomah County EMS

- Population: 700,000
- ALS Fire first response
  - City of Portland, Gresham and Airport Fire Departments
- ALS transport (AMR Multnomah County)
- Approximately 180 paramedics authorized to use drug facilitated intubation
## Background

<table>
<thead>
<tr>
<th>Year</th>
<th>Item</th>
</tr>
</thead>
<tbody>
<tr>
<td>2001</td>
<td>Systemwide deployment of Drug Facilitated Intubation in Multnomah County</td>
</tr>
<tr>
<td>2003-2004</td>
<td>Mandatory use of waveform ETCO₂ on all EMS units in Multnomah County</td>
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<tr>
<td>2006</td>
<td>Switch to Etomidate from midazolam as induction agent</td>
</tr>
<tr>
<td>2008</td>
<td>CPAP deployed systemwide by ALS providers in Multnomah County</td>
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</table>
MCEMS CPAP Protocol

- Adult patients presenting with moderate to severe respiratory distress
  - Awake, alert and able to maintain airway
  - Signs and symptoms consistent with CHF / Pulmonary Edema or COPD
  - SBP > 100 mm Hg
  - Over the age of 12 years.
Multnomah County Respiratory Distress Protocol

- Oxygen
- Albuterol
  - Suspected CHF
    - NTG
    - Furosemide
    - CPAP
  - COPD
    - Albuterol
    - Ipratropium
    - Steroids (methylprednisolone / dexamethasone)
    - CPAP
CPAP Oximeter Before / After AMR 2008 Data

N = 143 mean change = 11.55

# pts - First Pulse Ox
# pts - Last Pulse Ox
CPAP: Respiratory Rate Before / After: AMR 2008 Data

# patients

Change in Respiratory Rates

N = 143, mean change = -4.76
Multnomah county EMS Incidents 2003 - 2010

Incidents Dispatched

YEAR

- 2003 | 2004 | 2005 | 2006 | 2007 | 2008 | 2009 | 2010

- 10,000
- 20,000
- 30,000
- 40,000
- 50,000
- 60,000
- 70,000
- 80,000
Drug Facilitated Intubations 2006 - 2010
Drug Facilitated Intubation: Clinical Presentations 2006-2010

- Neuro
- Respiratory
- Toxicology
- Trauma

- Neurological
- Cardiovascular
- Congestive Heart Failure
- Sum Cardiac Resuscitation
- Respiratory
- Airway Obstruction
- Sum Respiratory
- Toxicology Sum
- Trauma Total
CPAP with Congestive Heart Failure
CPAP : Combined COPD / CHF

- COPD
- Cardiovascular - Congestive Heart Failure
Conclusions

- Systemwide CPAP deployment in an EMS system which performs drug facilitated intubation appears to decrease the incidence of drug facilitated intubation in patients presenting with respiratory distress secondary to congestive heart failure and/or COPD.
- Effect appears to be the greatest with patients presenting with CHF.
The END