Thunderstorm Asthma (What??)

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City of Miami & Key Biscayne Fire Rescue

MCI: Australia

EMS1.com News

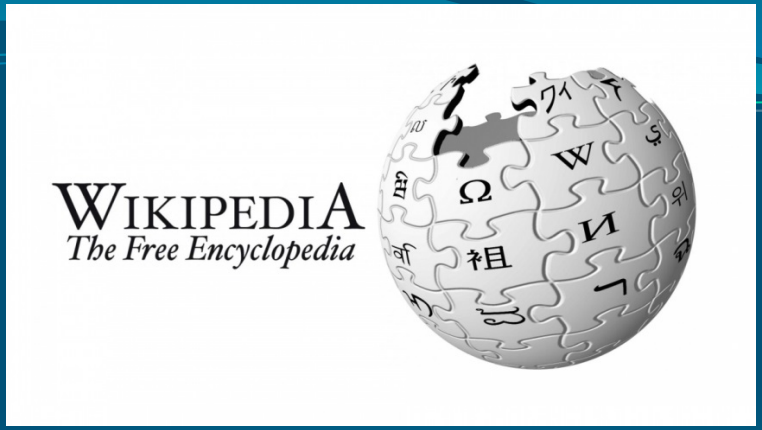
Rare 'thunderstorm asthma' kills 4 in Australia

Ambulance Victoria responded to more than 1,870 cases, which was six-times the usual workload for a Monday evening

Nov 23, 2016

Melbourne, Australia

- Population 4.4 million
- Hot sunny day in November then 6 pm thunderstorms
- Emergency call to 000 (911) every 4.5 seconds
- 8500 patients treated in < 24 hrs
- 9 died

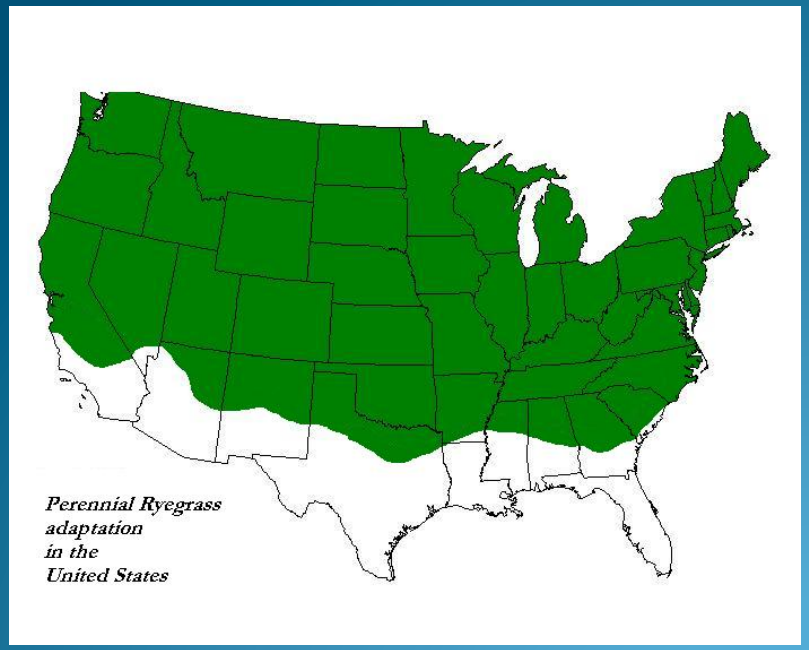


Thunderstorm asthma outbreaks

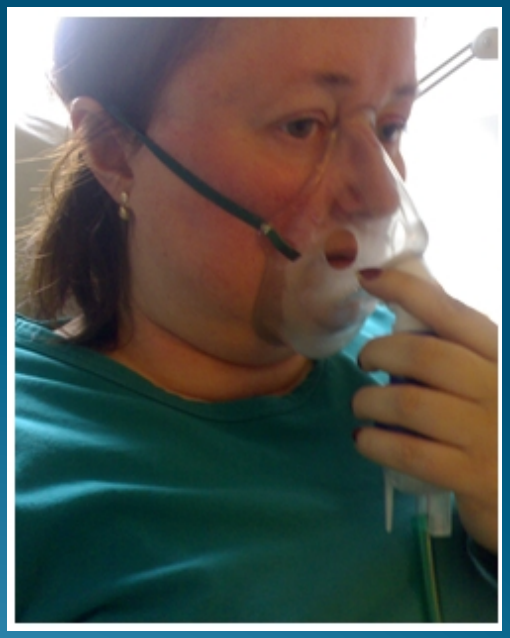
- Birmingham, England: 1983
- Melbourne, Australia: 1987, 1989, 2010
- London, England: 1994 with 640 ED visits (5 ICU)
- Italy: 2004 & 2010
- Iran: 2013
- Kuwait: Dec. 2016 with 844 ED visits (5 dead)

Perennial rye grass pollen:

- If water-logged, pollen ruptures into tiny particles & gets inhaled deep into lungs
- How common is hay fever/seasonal rhinitis?



EMS Treatment?

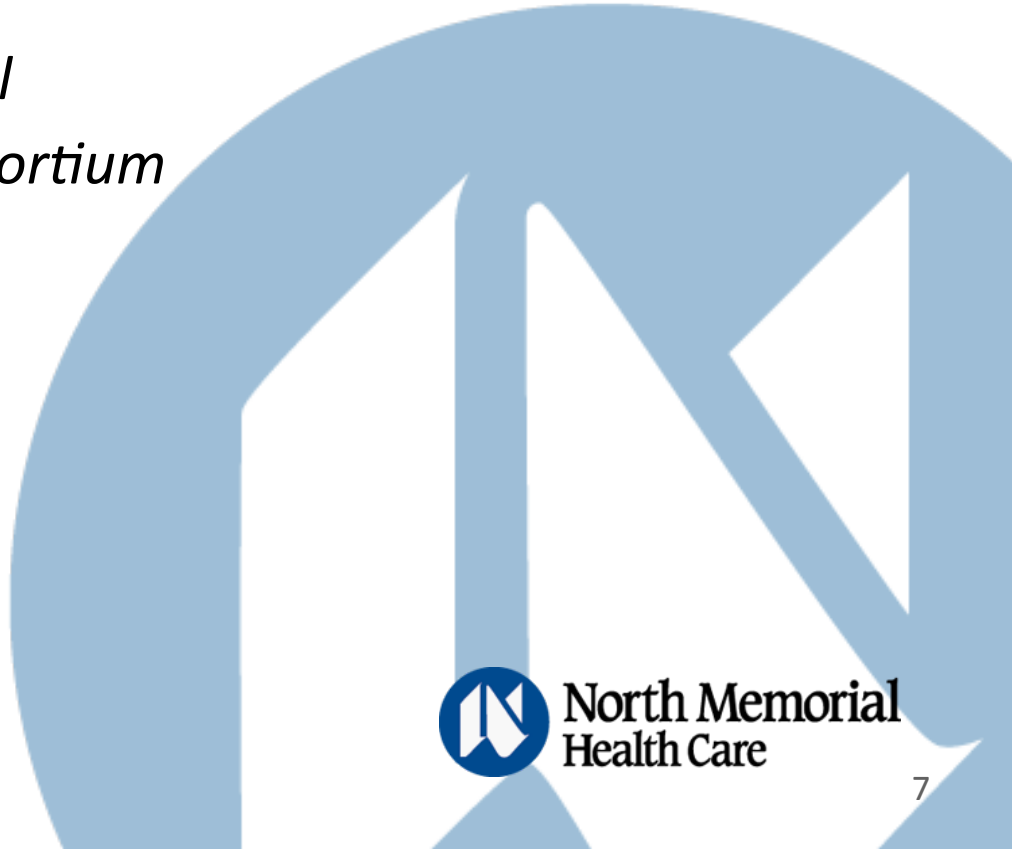


If you want to know more:

- Dabrera G, et al: Review: thunderstorm asthma: an overview of the evidence base and implications for public health advice. Q J Med 2013; 106:207-217
- D'amato G, et al: Thunderstorm-related asthma: what happens and why. Clin Exp Allergy 2016; 46: 209-6

Advanced Airway Reservations: What's the Best Supraglottic to Use?

Marc Conterato, MD, FACEP
Office of the Medical Director
NMAS and the HC EMS Council
Minnesota Resuscitation Consortium



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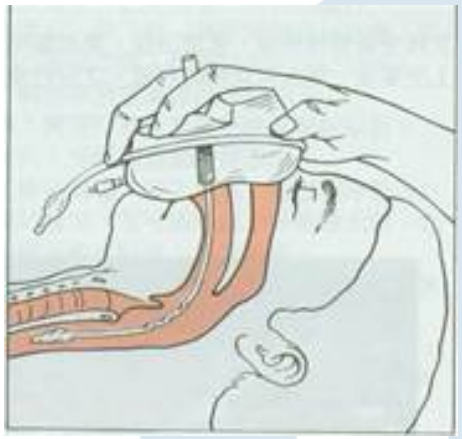
DISCLOSURE STATEMENT

- CME Speaker for ZOLL Circulation/Alsius Corp
- Specializing in Resuscitative Hypothermia and Emergency Medicine related issues
- Board Member, MN Resuscitation Consortium

The History of the SGA

- The esophageal obturator airway (EOA) was introduced for clinical use in 1973, and was the clinical forerunner of the modern SGA.
- While a revolutionary device, it had multiple hazards:
  - Tracheal intubation (commonest)
  - Esophageal perforation
  - Failure to pass tube
  - Failure to seal the mask
  - Obstruction to intubation



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The History of the SGA: The Laryngeal Mask Airway (LMA)

- Developed by British anesthesiologist Dr. Archie Brain in 1981. Marketed in Britain in 1988, the US in 1992.
- He felt the need for an airway that could be inserted easily, rapidly, and without any trauma even by the unskilled.

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Classification of SGAs

- First generation
  - These are defined as SGAs without a separate channel for the drainage of gastric contents.

- cLMA
- LMA Flexible
- LM Solus
- LM Portex Soft Seal*
- LM Aura Once*
- Cobra PLA*
- Laryngeal Tube (LTS)
- LMA Aura-I*
- Air-Q intubating LA*

Classification of SGAs

- Second generation
  - These are defined as SGAs with a separate channel for the drainage of gastric contents.
- ETC (Combitube)
- EasyTube
- LTS-D (King Airway)
- ProSeal LMA*
- Supreme LMA*
- SLIPA
- I-gel*
- AuraGain LM*

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OR use versus the pre-hospital setting

- OR patients usually have been fasted and premedicated prior to SGA placement; pre-hospital patients are not.
- OR patients usually do not require higher airway pressures for ventilation; pre-hospital patients may.
- OR patients usually do not have low-flow cardiovascular states; pre-hospital patients may (cardiac arrest, shock, etc).
- OR has the time to adequately prepare the patient (BVM ventilation, adequate positioning, etc.); pre-hospital providers may not.
- OR may have other rescue airway devices and procedures; we may not.

Characteristics of good pre-hospital SGAs

- Single use (disposable)
- Reliable ease of use
- Low complication rate
- High placement success rate
- Short elapsed time of placement (and verification)
- Airway sealing pressure (higher airway pressures)
- Ability to protect against gastric insufflation and regurgitation
- Ability to provide gastric decompression
- Protection against aspiration
- Minimize compression (or damage) to cervical structures
- Wide age/weight range
- Compatibility for intubation
- PRICE!!

SGA as primary airway versus rescue airway

- Primary airway

- In cardiac arrest
- In respiratory arrest
- In inaccessible patients
- In remote/austere environments

- Rescue airway

- In failed ETT placement
- In failure of DL/VL equipment
- In failed MAAM/RSI
- In significant facial/ mandibular trauma

Cuffed SGAs:
Oropharyrngeal-esophageal balloon devices

- ETC (Combitube)
- EasyTube
- Laryngeal Tube (LTS)
- LTS-D (King Airway)

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Cuffed versus Non-cuffed SGAs: LMA type devices

- Cuffed SGAs by their nature and design seal over the supra-glottic area by “enveloping” this area and also sealing (to certain degrees) the upper esophagus.
- Inflatable devices can provide higher airway sealing pressures, but at the price of compressing (or damaging) cervical structures.
- In addition, passive outflow from the cranial circulation can be impeded, causing increased venous pressure and passive venous congestion in the brain.

Cuffed versus Non-cuffed SGAs: LMA type devices

- cLMA+
- LMA Flexible
- LM Solus
- LM Portex Soft Seal*
- LM Aura Once*
- Cobra PLA*
- LMA Aura-I*
- Air-Q intubating LA*

- ProSeal LMA+
- Supreme LMA*
- I-gel*^
- SLIPA^

- <u>No Esophageal/gastric venting</u>

- <u>With Esophageal/gastric venting</u>

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Cuffed versus Non-cuffed SGAs: LMA type devices

- I-gel airway
  - Made from a medical grade thermoplastic elastomer that is designed to create a non-inflatable, anatomical seal of the pharyngeal, laryngeal and perilaryngeal structures.
  - Body heat from the patient activates the gel component of the airway, which expands to fill the void in the hypopharynx where the device rests.

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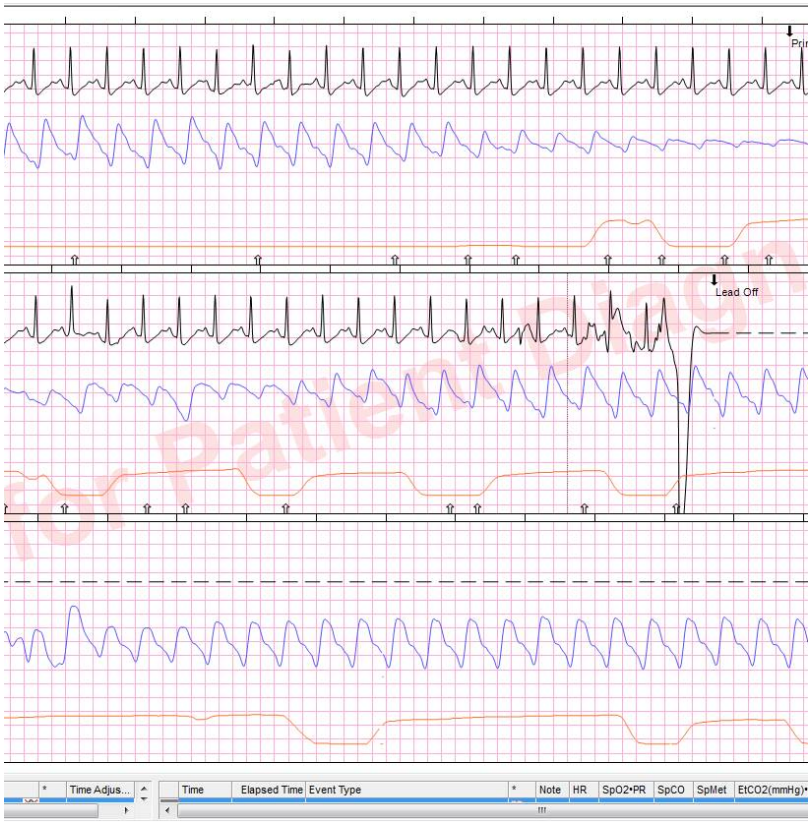
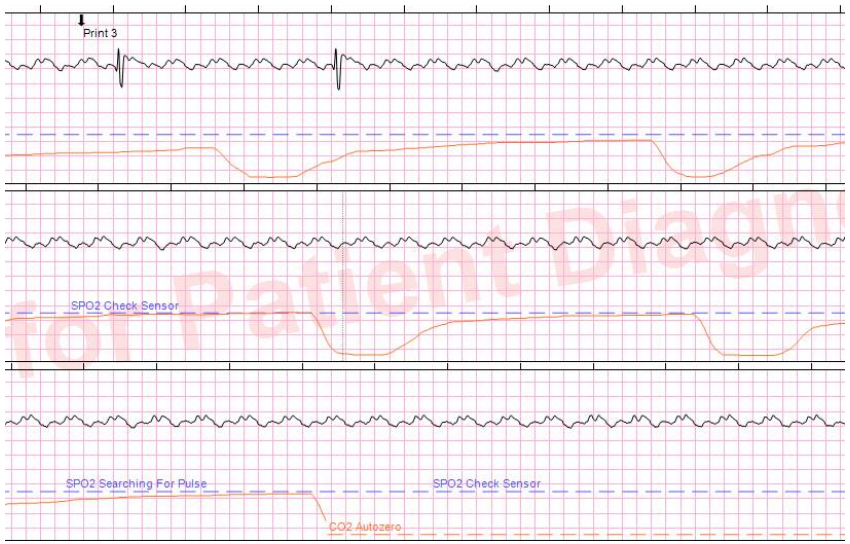
ETCO2 Waveform in I-gel versus ETT



I-gel



ETT

NMAS SGA Experience

- **<u>04/15-10/15/2015</u>**
- King airway: 184
- ET intubation: 617
- King airway placed in @ 23% of all airway interventions
- King Airway success rate: ***87.21%***

- **<u>10/15/2015- 8/30/2016</u>**
- King: 67
- I-gel: 401
- Intubation 1017
- I-gel airway placed in @ 27% of all airway interventions
- I-gel airway success rate: ***92.91%***

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CONCLUSIONS

- The SGA selected should have:
  - Reliable ease of use
  - Low complication rate
  - High first-passage success rate
  - The ability to protect against gastric insufflation/regurgitation
  - The ability to provide gastric decompression and protect against aspiration
  - Minimize compression (or damage) to cervical structures
  - Have a wide age/weight range
  - Capability for in-line intubation without device removal (if possible)

- Special Thanks to:
  Alex Trembley, NREMTP
  Field Training Officer,
  Quality Management
  Specialist