

**Pediatric Intubation 2012**  
**Can we do it safely?**

Darren Braude, MD, EMT-P  
Professor of Emergency Medicine and Anesthesiology  
EMS Section Chief and Fellowship/Consortium Director  
National Medical Director, *The Difficult Airway Course: EMS*  
Author, *Rapid Sequence Intubation & Rapid Sequence Airway*,  
2<sup>nd</sup> Edition: *an Airway911 Guide*

---

---

---

---

---

---

---

---

**What does it take?**

- Education
- QA
- Emphasize alternatives
- One attempt only
- Advanced imaging technology
- Transport ventilators
- Capnography
- Only during transport
- Consider limiting skill to select group
- Consider “mother may I”
- Consider RSI

---

---

---

---

---

---

---

---

**Education**

- Initial
- On-going
  
- Live tubes?
- HPS?

---

---

---

---

---

---

---

---

**Learning Curves for Bag-and-mask Ventilation and Orotracheal Intubation**

*An Application of the Cumulative Sum Method*

Ryu Komatsu, M.D.,\* Yusuke Kasuya, M.D.,\* Hisanori Yogo, M.D.,\* Daniel L. Sessler, M.D.,† Edward Mascha, Ph.D.,‡ Dongsheng Yang, M.S.,§ Makoto Ozaki, M.D.||

Anesthesiology 2010; 112:1529-31

**What This Article Tells Us That Is New**

- ◆ In 15 inexperienced interns in specialties other than anesthesia, 14 achieved an 80% success rate after a median of 25 bag-and-mask ventilation procedures
- ◆ Only 9 of 15 interns achieved an 80% success rate for endotracheal intubation, and these did so after a median of 35 procedures

---

---

---

---

---

---

---

---

---

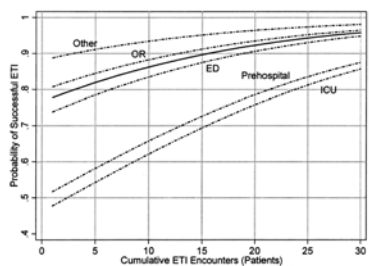
---

---

---

**DEFINING THE "LEARNING CURVE" FOR PARAMEDIC STUDENT ENDOTRACHEAL INTUBATION**

Henry E. Wang, MD, MPH, Samuel R. Seitz, MEd, RN, NREMT-P, David Hostler, PhD, NREMT-P, Donald M. Yealy, MD  
PREHOSPITAL EMERGENCY CARE 2005;9:156-162




---

---

---

---

---

---

---

---

---

---

---

---

**CoAEMSP**

The paramedic student should be successful in a combination of live intubations, high definition simulations, low fidelity simulations, and cadaver labs in all age brackets. High definition simulation, defined by SIM Man, Meti Man, etc., is highly recommended but optional. Low fidelity simulation is defined by traditional simulation heads, such as Laredal, etc. **Paramedic students should have exposure to diverse environments, including but not limited to hospital units (e.g. operating rooms, emergency departments, intensive care units), ambulatory centers, and out of hospital settings (e.g. ambulance, field, home) and laboratories (floor, varied noise levels, varied lighting conditions).** The paramedic student should have no fewer than 50 attempts at airway management across all age levels, with a 90% success rate utilizing endotracheal intubation models in their last 10 attempts. The paramedic student needs to be 100% successful in the management of their last 20 attempts at airway management. The majority of airway attempts should be emphasized with live intubations, realistic simulation labs, or both. As with all other required skills, terminal competency needs to be validated by the program medical director's signature.

---

---

---

---

---

---

---

---

---

---


---

---



### Pediatric EGDs

- LMA-Unique
  - Time to retire
- LMA-Supreme
- AirQ
  - Regular
  - Self-pressurizing
- iGel
  - No gastric vent size 1.0
- +/- King
  - Down to 12 kg/3 ft
  - No gastric vent < 4 feet
- +/- EasyTube
  - Down to 3 feet tall




---

---

---

---

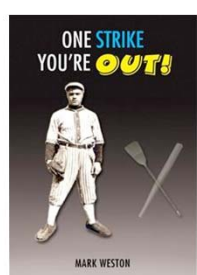
---

---

---

---

### One attempt only



- Make it a good one!
- With CPR in progress

---

---

---

---

---

---

---

---

#### Association Between Repeated Intubation Attempts and Adverse Events in Emergency Departments: An Analysis of a Multicenter Prospective Observational Study

Kohei Hasegawa, MD, Kazuaki Shigemitsu, MD, Yusuke Hagiwara, MD, MPH, Takuyo Chiba, MD, Hiroko Watase, MD, Calvin A. Brown III, MD, David F. M. Brown, MD, for the Japanese Emergency Medicine Research Alliance Investigators

[Ann Emerg Med. 2012;60:749-754.]

**Results:** Of 2,616 patients, 290 (11%) required greater than or equal to 3 intubation attempts. Compared with patients requiring 2 or fewer intubation attempts, patients undergoing multiple attempts exhibited a higher adverse event rate (35% versus 9%). After adjusting for age, sex, principal indication, method, medication, and operator characteristics, intubations requiring multiple attempts were associated with an increased odds of adverse events (odds ratio 4.5; 95% confidence interval 3.4 to 6.1).

---

---

---

---

---

---

---

---

### Advanced Imaging Technology

- Impact unclear
- Has its own learning curve
- Not "The Answer"



---

---

---

---

---

---

---

---

### Transport Vents

- Critical to avoid over-ventilation
- Should be mandatory for all prehospital ETI
- Not all models will ventilate pediatrics



---

---

---

---

---

---

---

---

### Capnography

- Critical to confirm tube
  - Initially
  - On-going
- Critical to avoid over-ventilation
  - Titrate to normal ETCO2



---

---

---

---

---

---

---

---

### Perform ETI in transport



- Do not delay on scene
- BVMV and possibly EGD only prior to transport

---

---

---

---

---

---

---

---

### Limit Peds ETI to Selected Providers?

- Pro
  - Easier skill maintenance
  - Easier quality control
- Con
  - Can they be everywhere?
  - Two standards of care



---

---

---

---

---

---

---

---

### “Mother, may I?”



- Pro
  - More control
  - Limit procedure to those most likely to benefit
- Con
  - Delays
  - Technology issues
  - Inconsistent MD advice
  - Going back in time?

---

---

---

---

---

---

---

---

### Consider RSI/RSA

- Many states and systems exclude pediatrics
- Counter-intuitive but pediatric patients that need RSI may be a more salvageable group
- Potential for more control of factors already discussed
- Very limited data on prehospital peds RSI
  - Evidence in adults mixed to poor

---

---

---

---

---

---

---

---

### What does it take?

- Education
- QA
- Emphasize alternatives
- One attempt only
- Advanced imaging technology
- Transport ventilators
- Capnography
- Only during transport
- Consider limiting skill to select group
- Consider “mother may I”
- Consider RSI

---

---

---

---

---

---

---

---

### Take Home Points

- We need to be honest with ourselves
  - Can we really do all these things?
  - How many of us feel comfortable with peds ETI?
    - Not fair to our providers when we have other options
- No pediatric ETI for most services
- Consider maintaining for select providers
  - Maybe with RSI/RSA
- Maintain DL for FBs

---

---

---

---

---

---

---

---