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A randomized comparison of the Truview videolaryngoscope with the Macintosh and Miller laryngoscopes when used by novices in pediatric manikins with normal and difficult airways

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Introduction

- Many clinicians have limited experience with laryngoscopy, especially in children, but are still expected to intubate when necessary.
- Therefore, testing novices may provide insight into optimal airway management for clinicians with limited laryngoscopy experience.
- Pediatric manikin studies show that the novice operator may have a better glottic view with videolaryngoscopy (VL), but not necessarily faster intubation times or higher success rates.[1]

Truview videolaryngoscope[2]

- The Truview is a newer VL with an optical lens system and angulated blade tip to provide a more anterior and improved glottic view without having to align oral, pharyngeal, and tracheal axes.[2]
- This study compared the Truview with Mac and Miller laryngoscopes in normal and difficult airway scenarios by novice operators, using time to successful intubation as a primary endpoint.

Methods

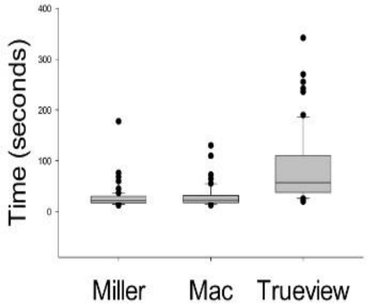
- A prospective randomized crossover study
- Participants were 60 medical students with no prior airway experience
- Participants received standardized airway management instruction
- Participants were randomized into sequences of the three airway devices to be used: Macintosh, Miller, and Truview
- Order of manikin scenarios was standardized:
  - #1: Normal airway, supine position
  - #2: Normal airway, left lateral position
  - #3: Cervical immobilization
  - #4: Airway obstruction (tongue swelling)
- Primary endpoint: time to successful intubation
- Secondary endpoints: number of attempts, subjective ease of use of device, quality of laryngeal view, number of optimization maneuvers

Gaumard One Year Airway Trainer[3]

Results

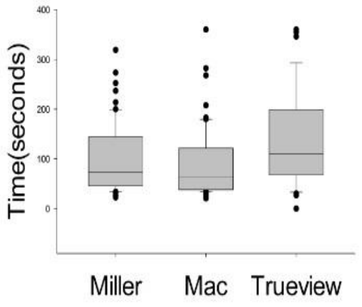
Scenario 1 (normal supine airway):
- Truview resulted in lower first attempt success (58%) vs Miller (98%) and Mac (90%)
- Intubation time was slowest with Truview

Fig 1: Time to intubate normal supine airway



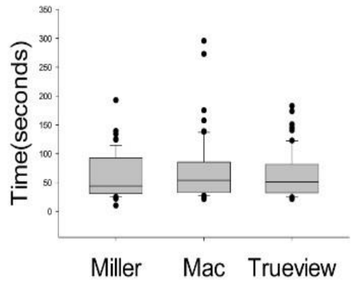
Scenario 2 (left lateral normal airway):
- First attempt success was similar across all devices
- Intubation time was slowest with Truview

Fig 2: Time to intubate left lateral normal airway



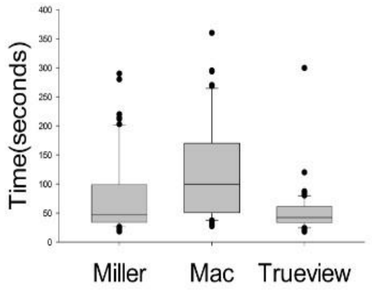
Scenario 3 (cervical immobilization):
- Devices were all comparable for time to intubation and number of attempts
- Truview provided the best grade of view and was rated subjectively as best view and easiest to use

Fig 3: Time to intubate cervical immobilization airway



Scenario 4 (airway obstruction):
- Truview provided higher first-attempt success (96.7%) vs Miller (68.3%) and Mac (50%)
- Truview provided fastest intubation times, fewest optimization maneuvers, and superior views of glottis

Fig 4: Time to intubate obstructed airway



Conclusion/Discussion

- In the normal airway manikin, novices were faster and had higher success rates with the Mac and Miller blades than with the Truview.
- In the airway obstruction manikin, novices performed better and faster with the Truview.
- These results support existing VL literature, suggesting that VL glottic views are excellent but do not always translate to faster intubation times.[4,5]
- However, there is some evidence that VL may be superior in difficult airway scenarios,[6] which our study also supports.
- Future investigations may involve:
  - Studying actual medical personnel who perform intubation infrequently but may still be required to do so in a clinical setting
  - Studying the retention of airway skills with each device at a later date
  - Studying the learning curves of various devices

References

1. Rabiner JE, Auerbach M, Avner JR, Daswani D, Khine H. Comparison of GlideScope Videolaryngoscopy to Direct Laryngoscopy for Intubation of a Pediatric Simulator by Novice Physicians. Emergency Medicine International. 2013; 2013: 407547.
2. Truphatek International Ltd.. Truview EVO2 Infant Videolaryngoscope, 2015. http://www.truphatek.com/product.php?ID=28 (accessed 1.30.15)
3. Gaumard Scientific. S312 1-Year Pediatric Airway Trainer, 2018. http://www.gaumard.com/s312 (accessed 2.28.2018)
4. Sun Y, Lu Y, Huang Y, Jiang H. Pediatric video laryngoscope versus direct laryngoscope: a meta-analysis of randomized controlled trials. Paediatric Anaesthesia. 2014; 24: 1056–65.
5. Singh R, Singh P, Vajifdar H. A comparison of Truview infant EVO2 laryngoscope with the Miller blade in neonates and infants. Paediatric Anaesthesia. 2009; 19: 338–42.
6. Kalbhenn J, Boelke AK, Steinmann D. Prospective model-based comparison of different laryngoscopes for difficult intubation in infants. Paediatric Anaesthesia. 2012; 22: 776–80.