Determinaton of a Learning Curve for the Pediatric Glidescope in Airway Management Novices – A Mannequin Study

Evan Mathew MD 1, Craig Birnent MD 1, Fazael Anhail MD 1, James Boris MD 1

University of Connecticut Department of Anesthesiology 1, Connecticut Children’s Medical Center Department of Anesthesiology 1, Yale New Haven Hospital Department of Emergency Medicine 1

ABSTRACT

BACKGROUND: Evidence suggests videolaryngoscopes (VL) are superior to direct laryngoscopes (DL) in management of adult difficult airways. Experienced practitioners advocate using VL in pediatric difficult airways, though this has not been borne out as a proven superior approach. In novices, pediatric VL may have a higher failure rate than DL and require greater time to intubation. 

OBJECTIVE: Delineate separate learning curves for infant VL and intubation in novices.

METHODS: IRB exemption was obtained. Volunteer airway novices were housestaff (HO) from anesthesiology (3), pediatrics (6), and emergency medicine (6). HO were timed performing repeated tasks of airway management on a Laerdal infant airway mannequin using a pediatric Glidescope VL with size 0 blade and applied 3.0 uncuffed tracheal tube (ETT). Participants performed 6 successive laryngoscopies to obtain an adequate glottic view. They then maintained a static glottic view while passing the ETT 4 successive times into the trachea. Finally 3 combined laryngoscopy and intubations were performed, with attention to the timing of each component.

RESULTS: Laryngoscopy and intubation learning curves showed initial rapid improvement and then flattened (Fig 1). The mean time of 1st laryngoscopy was 5.5 seconds, the 2nd was 5.7s, and 3rd was 2.6s – this reached statistical significance by student’s t-test (p<0.05). The learning curve of isolated intubation flattened after the second attempt; the mean time of 1st intubation was 14.8s and 2nd attempt was 7.1s (p<0.05). In combined laryngoscopy and intubation, mean total intubation times were 9.8s, 12.6s, and 7.8s and did not deviate statistically further improvement.

CONCLUSIONS: Our experience with novice HO shows infant VL in normal airway is a quickly acquired skill in physicians of all backgrounds. Similar to adult data it appears that the learning curve of infant laryngoscopy flattens after three attempts. Though the AAP Neonatal Resuscitation Program guidelines recommend a 20s limit to the process of intubation, there is evidence that it is too brief for average resuscitators to succeed – many need 30s. Our data show HO coached through videolaryngoscopy are able to intubate well within the 20s guideline. Limitations of the study is the mannequin, which is imperfect in simulation. Further study should be done to evaluate the longevity of skill after a single session, and viability of clinical translation.

REFERENCES:
2. Aesthesiology 2012;116(3):622-8