

An Automatic Video Laryngoscope Archiving System with a Pilot Study of First Pass Rates for 20 Randomly Selected Archived Intubations

Presenting Author: Gabrielle Hoyer, M.S.

Co-authors: Alison Abitz, M.D., Gabrielle Hoyer, M.S., Sean Runnels, M.D.

Currently, the record of the intubation is recalled by the operator, translated into a procedure note, and recorded in the medical record. First pass rate is a common benchmark used in intubation quality assurance.¹ Self-reporting during airway procedures has been shown to be a low fidelity record of intubation events such as the number of intubation attempts.² Use of a video laryngoscope (VLS) for intubation always produces a high-fidelity video feed from camera to the screen used by the operator to perform the intubation. Currently, the VLS video feed is not routinely databased for strategic evaluation. We hypothesized that an automatic archiving system is capable of storing VLS intubations for later strategic evaluation, study, and quality assurance. And that first pass rates can be established using that archived high-fidelity data. We used the HDMI port (meant to connect a second display) of a Glideslope VLS to 'poach' a digital video stream during intubations. We designed software and hardware that automatically recorded the intubation and transmitted the recording to a video database in our workroom wirelessly when the glideslope was within connecting distance of our wireless router system. Once transferred the Intubations were stored in a database for retrieval at a later date. Once our database reached 200 intubations, 20 were randomly selected for evaluation of first pass intubation rate, the total number of attempts, and the number of individual thrusts at the vocal cords with each attempt, using either an endotracheal tube or a stylet. An intubation attempt was defined as the passing of an endotracheal tube into the trachea in one continuous video laryngoscope viewing. Each viewing was designated as an additional attempt. A thrust was defined as any individual movement of an endotracheal tube toward the vocal cords. An archiving system for VLS intubations can be set up for the storage of high-fidelity recordings of intubations. Once set up, this high-fidelity data can be processed to establish benchmarks for quality assurance as well as other research. In this case, first pass rates for a randomly selected subset of data was shown to be 1.18 attempts per intubation. With an average number of thrusts per intubation to be 2.5.

1. Park L, Zeng I, Brainard A. Systematic review and meta-analysis of first-pass success rates in emergency department intubation: Creating a benchmark for emergency airway care. *Emerg Med Australas*. 2017; 29(1):40-47. DOI:[10.1111/1742-6723.12704](https://doi.org/10.1111/1742-6723.12704)
2. Rinderknecht AS, Dyas JR, Kerrey BT, Geis GL, Ho MH, Mittiga MR. Studying the Safety and Performance of Rapid Sequence Intubation: Data Collection Method Matters. *Acad Emerg Med*. 2017; 24(4):411-421. DOI:[10.1111/acem.13145](https://doi.org/10.1111/acem.13145)