

Comparison of Perceived to Actual Time of Prehospital Intubation by Paramedics

Daniel Shou, B.S.¹, Eric Garfinkel, D.O.^{1,2}, Ruben Troncoso, M.D.^{1,2}, Becca Scharf, M.S.²
Asa Margolis, D.O.^{1,2}, Matt Levy, D.O.^{1,2}

¹Department of Emergency Medicine, Johns Hopkins University School of Medicine, Baltimore, USA
²Office of the Medical Director, Howard County Department of Fire and Rescue Services, Marriottsville, USA



Introduction

- Endotracheal intubation (ETI) is an essential skill to manage a patient with an unstable airway or ineffective breathing.
- ETI can quickly become harmful if laryngoscopy time is prolonged¹.
- Even expert clinicians can suffer from cognitive errors during ETI that can lead to prolonged apnea time and poor patient outcomes^{2,3}.
- Prehospital ETI usually involves patients in extremis or in cardiac arrest for which there is minimal literature regarding safe procedure time.

Objective

- Determine the situational awareness of paramedics during prehospital ETI by examining the perceived vs actual total laryngoscopy time (TLT).

Methods

- Retrospective review consisting of prehospital intubations conducted from January 5th, 2021 to March 21st, 2022.

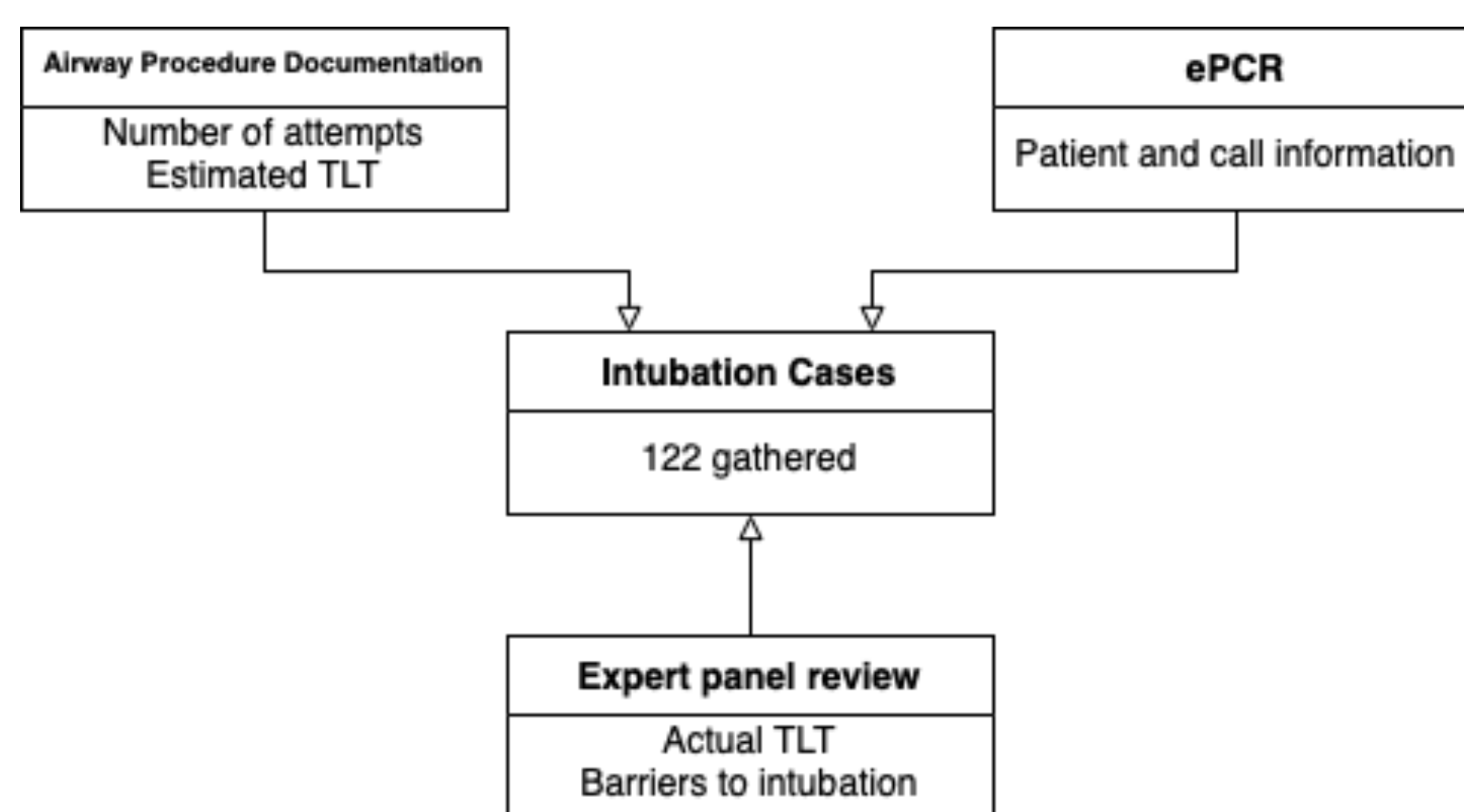


Figure 1. A schematic illustrating information that was collected as part of each intubation case.

- Primary outcome was the difference between actual TLT and perceived TLT.
- Secondary outcomes were any relationships between high time difference and patient age, paramedic years of experience, perceived presence of difficult anatomy, excess secretions, and the use of RSI.

Results

- The unadjusted mean and median differences between actual and perceived TLT were 22 seconds and 19 seconds, respectively.
- After excluding outliers, the mean and median differences between actual and perceived TLT were both approximately 18 seconds.
- There were no specific intubation characteristics that were associated with high time differences between actual and perceived TLT.

Table 1: Comparison of mean and median actual TLT versus perceived TLT among all included intubations (n=112) and excluding outliers (n=103).

	Actual TLT	Perceived TLT	Difference	p-value
All Intubations				
Mean	50.0 sec	27.8 sec	22.2 sec	< 0.001
(95% CI)	(43.7 - 56.3 sec)	(24.6 - 31.0 sec)	(15.5 - 28.9 sec)	
Median	43.0 sec	20.0 sec	18.5 sec	< 0.001
[IQR]	[31.0 - 57.5 sec]	[15.0 - 30.0 sec]	[6 - 30 sec]	
Excluding Outliers				
Mean	44.6 sec	26.8 sec	17.9 sec	< 0.001
(95% CI)	(41.2 - 48.1 sec)	(23.7 - 29.8 sec)	(14.5 - 21.2 sec)	
Median	43.0 sec	20.0 sec	18.0 sec	< 0.001
[IQR]	[31.0 - 56.0 sec]	[15.0 - 30.0 sec]	[6 - 29 sec]	

Table 2: Univariate logistic regression of intubation characteristics associated with having high time distortion excluding outliers (n = 103).

Intubation Characteristics	OR (95% CI)	p-value
Patient Age	0.98 (0.96-1.01)	0.145
Paramedic Years of Experience	0.94 (0.88-1.00)	0.061
Difficult Anatomy	0.39 (0.04-3.25)	0.381
Excess Secretions	0.38 (0.12-1.22)	0.106
Rapid Sequence Intubation	1.24 (0.35-4.31)	0.739

Discussion

- Acquisition and maintenance of situational awareness is difficult, particularly in highly dynamic environments.
- Paramedics seem to encounter an unconscious time dilation during ETI in which they perceive that less time has elapsed than what passes.
- This may suggest decreased situational awareness, which can result in an unintentionally prolonged apnea time and poorer patient outcomes, particularly in patients with an unknown down time.
- Presence of time dilation may also suggest lowered awareness of the clinical environment.

Implications

- Paramedic training and body of literature currently emphasizes first pass success as the benchmark of a successful intubation.
- The large emphasis on first pass success may lead to first pass fixation at the expense of a prolonged apnea time.
- The definition of a successful intubation may necessitate a shift from first pass success to total intubation time that is further reinforced during clinician training and practice.

Limitations

- Data was only collected from a single department, limited generalizability to other departments / systems.
- Observational study which can only determine correlation of time differences. Definite causation of these differences cannot be determined with absolute certainty.

Acknowledgements

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