

# Comparison of Intubation Modalities in a Simulated Cardiac Arrest With Uninterrupted Chest Compressions



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## INTRODUCTION

### Background:

- Interruptions in chest compressions can negatively impact survival.
- Multiple endotracheal intubation (ETI) attempts and prolonged ETI attempts during CPR are associated with worse patient outcomes.
- Multiple airway adjuncts including video laryngoscopy and gum-elastic bougie have been advocated to help improve ETI success.
- Little evidence in the literature utilizing video laryngoscopy with a gum-elastic bougie for ETI.

## METHODS

- **Setting:** A community teaching hospital with an emergency medicine residency.
- **Design:** Randomized, crossover study comparing methods of ETI during uninterrupted CPR.
- **Methodology**  
 Convenience sample of emergency physicians performed ETI during a simulated cardiac arrest with continuous chest compression  
 Three ETI techniques in random order:  
 Glidescope Video Laryngoscopy (GVL)  
 Direct Laryngoscopy (DL)  
 Glidescope with bougie (GVL-B)  
 All providers were given a 1-hour training course on usage of GVL and GVL-B.  
 Primary outcome: Time taken to intubate (TTI) in seconds  
 Laryngoscope blade passed the lips until the first  
 Data were compared using non-parametric statistics, Mann-Whitney and Kruskal-Wallis.  
 Designed Kaplan-Meier estimates of TTI for each device

## STUDY SAMPLE

Emergency medicine attendings and residents, performing timed ETI's during chest compressions.

## FIGURES & TABLES

**Table 1** Demographics of participants (n=20)

Age—mean (SD), years	35.2 (7.8)
Sex—male, n (%)	11 (55%)
Handedness—right-handed, n (%)	17 (85%)
Experience n (%)	
PGY 1	4 (20%)
PGY2	3 (15%)
PGY3	5 (25%)
PGY4	1 (5%)
Attending	7 (35%)

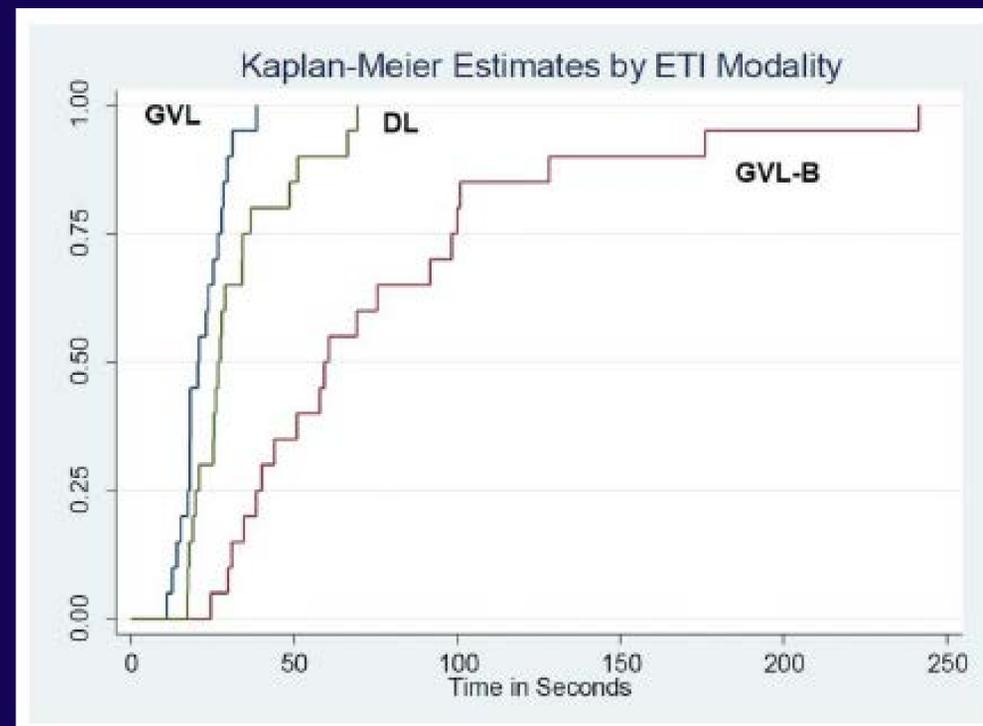
PGY, postgraduate year.

**Table 2** Median time to intubate in seconds by device comparing junior and senior providers

	Junior providers	Senior providers	p Value
DL (IQR)	34.2 (27.6, 51)	25.4 (18.9, 27.3)	0.03
GVL (IQR)	20.8 (17.9, 28.2)	20.4 (17.5, 26.6)	0.66
GVL-B (IQR)	98.2 (59.3, 128)	50.9 (34.5, 75.4)	0.09

DL, direct laryngoscopy; GVL, GlideScope; GVL-B, GlideScope with bougie.

**Figure 1** Kaplan–Meier estimates by endotracheal intubation (ETI) modality. DL, direct laryngoscopy; GVL, GlideScope; GVL-B, GlideScope with bougie.



## RESULTS

- Median TTI (IQR) in seconds over all devices was 28.5 s (20.6, 51).
- GVL had the lowest median TTI's in seconds for all providers (20.6, IQR 17.7, 27.1) followed by DL (27, IQR 20.3, 35.4) and GVL-B (60.1, IQR 39.1, 99) (p=0.0001).
- Both GVL and DL had similar steep curves leading to 100% successful intubation attempts while GVL-B took longer for all providers to successfully secure the airway.
- The GVL-B required the greatest TTI for both the junior and senior subgroups.

## LIMITATIONS

- Simulated airway mannequin
- Learning the GVL-B technique, artificially elevating the median times for this device
- Assumption that clinical outcomes will improve with shorter TTI's

## CONCLUSIONS

- In this simulated model cardiac arrest with uninterrupted chest compressions, GVL provided either equal or shorter median TTI's than either DL or GVL-B across providers with a range experience

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