

# GlideScope Video Laryngoscopy versus Direct Laryngoscopy for Emergency Department Intubations

Danielle Campagne, MD, Timothy F. Platts-Mills, MD, Gregory W. Hendey, MD, Brian Chinnock, MD, Brandy Snowden, MPH  
UCSF Fresno Department of Emergency Medicine, Fresno, CA



## Objectives

To compare the first attempt success rate using GlideScope® video laryngoscopy and direct laryngoscopy in an Emergency Department (ED) setting.

## Methods

This is a prospective observational study of adult patients undergoing intubation in the ED of a Level I trauma center with an emergency medicine residency. Patients were consecutively enrolled between August of 2006 and February of 2008. Data collected included indication for intubation, patient characteristics, device used, success with first attempt, time to successful intubation, intubation failure, and initial and lowest oxygen saturation levels. An attempt was defined as the introduction of either laryngoscope into the mouth. Failure was defined as an esophageal intubation, changing to a different device or physician, or inability to place the endotracheal tube after 3 attempts.

## Results

We enrolled 280 patients of whom video laryngoscopy was used for the initial intubation attempt in 63 (22%) and direct laryngoscopy was used in 217 (78%). Reasons for intubation included: AMS (64%), respiratory distress (47%), facial trauma (9%), and immobilization for imaging (9%). Overall, 233 (83%) intubations were successful on the first attempt, 26 (9%) failures occurred, and one patient received a cricothyrotomy. The first attempt success rate was 51 of 63 (81%, 95% CI 70 - 89%) for video laryngoscopy vs. 182 of 217 (84%, 95% CI 79 - 88%) for direct laryngoscopy. Median time to successful intubation was 42 seconds for video laryngoscopy vs. 30 seconds for direct laryngoscopy ( $p < 0.01$ ).

Table 1. Patient characteristics

Characteristics	Video Laryngoscopy (n=63)	Direct Laryngoscopy (n=217)
Mean age, years (range)	51 (18-80)	50 (18-100)
Mean weight, kg (range)	74 (45-114)	77 (40-220)
Medical Patients (%)	46 (73)	137 (63)
Trauma Patients (%)	17 (27)	80 (37)
Reason for Intubation		
Altered Mental Status (%)	42 (67)	137 (63)
Respiratory Failure (%)	32 (51)	95 (44)
Facial Trauma (%)	6 (10)	18 (8)
Immobilize for imaging (%)	7 (11)	17 (8)
Complicating Characteristics		
C-spine Precautions (%)	18 (29)	90 (32)
Cardiac Arrest (%)	3 (5)	28 (13)
Obesity (%)	2 (3)	13 (6)

Table 2. Outcome measurements

Characteristics	Video Laryngoscopy (n=63)	Direct Laryngoscopy (n=217)
First Attempt Success Rate, No. (% , 95% CI)	51 (81%, 70-89)	182 (84%, 79-88)
Failure Rate, No. (% , 95% CI)	9 (14%, 7-25)	17 (8%, 5-12)
Median Time to Successful Intubation, sec.	42	30
Mean initial pulse oximetry, % (95% CI)	97 (95-99)	96 (95-97)
Mean lowest pulse oximetry, % (95% CI)	89 (84-94)	91 (89-93)

## Conclusions

Rates of successful intubation on first attempt were similar between video and direct laryngoscopy, but intubation using video laryngoscopy took more time to complete.

## Limitations

As an observational study, choice of device for intubation was left to the provider. Although patient characteristics were similar for the two groups (Table 1), such similarities do not exclude the possibility of selection bias. There was a trend toward preferential use of direct laryngoscopy in cases of cardiac arrest, probably due to its more immediate availability.

Initial intubations were all performed by emergency medicine residents who had varying levels of experience in airway management. Most of the residents had limited experience using video laryngoscopy, but had at least 50 intubations with direct laryngoscopy. As such, this study does not provide an equal comparison of video vs. direct laryngoscopy. It does, however, provide a perspective on the effectiveness of video laryngoscopy when introduced into an ED.

Our study focused on the GlideScope as a primary airway device rather than as a rescue technique. Further study is needed to determine the role of the GlideScope as an airway adjunct or rescue device.