

# Paramedic - Evidence Based Medicine (P-EBP) Program

## Paramedic CAT (Critically Appraised Topic) Worksheet

**Title:** The use of video laryngoscopy versus direct laryngoscopy by paramedics in the pre-hospital setting

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**Clinical Scenario:** You are on-scene with an adult patient in respiratory failure requiring intubation. Your airway assessment shows a decent chance of success and there are limited secretions in the airway. You open the intubation kit and have a choice to make: direct laryngoscopy or video laryngoscopy? Which will offer the greatest chance for first pass success?

### **PICO (Population – Intervention – Comparison – Outcome) Question:**

For patients undergoing prehospital intubation, does the use of video laryngoscopy (VL) versus direct laryngoscopy (DL) lead to greater first pass success rates?

### **Search Strategy:**

((adult AND prehospital OR pre-hospital OR "out of hospital" OR OOH AND intubation OR "endotracheal intubation" AND paramedic OR EMT OR EMS)) AND ("video laryngoscopy" OR videolaryngoscopy OR VL OR "King vision" OR glidescope OR mcgrath)) AND ("Direct laryngoscopy" OR DL OR "direct laryngoscope" OR macintosh)) AND ("First pass success" OR successful)

**Search Outcome:** 6



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## Relevant Papers:

AUTHOR, DATE	POPULATION: SAMPLE CHARACTERISTICS	DESIGN (LOE)	OUTCOMES	RESULTS	STRENGTHS/ WEAKNESSES
Savino B. 2017	8 studies comparing VL to DL in the prehospital setting	Meta-analysis	Overall success rates First-pass success rates	<p>Pooled estimates for overall success and first-pass success using VL versus DL were not reported due to high heterogeneity (<math>I^2 &gt; 90\%</math>).</p> <p>Studies using physician intubators showed a much lower rate of success with VL compared to DL (RR=0.05, 95% CI = 0.01-0.18), while studies using non-physicians had a higher rate of overall success with VL versus DL (RR = 2.28, 95% CI = 1.00-5.20).</p> <p>Studies using physician intubators had lower first pass success with VL compared to DL (RR = 0.32, 95% CI = 0.23-0.44), while non-physicians had a higher first pass success rate with VL compared to</p>	<p>Strengths: Specific to prehospital setting</p> <p>Separated physician and non-physician intubators</p> <p>Weaknesses: Extensive heterogeneity across the studies likely due to varied study designs, varying types of video devices between studies and a potential difference in definition of an intubation attempt between studies.</p>



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				DL (RR = 1.83, 95% CI = 1.18-2.84).	
Jarvis J. 2015	514 patients undergoing prehospital intubation for any indication	Retrospective observational analysis	Success per attempt  Overall success  First-pass success	<p>VL had an overall success rate of 91.5% compared with 64.9% for DL (<math>p &lt; 0.01</math>)</p> <p>VL had a 71.2% success rate per attempt compared to 44.4% for DL (<math>p &lt; 0.01</math>)</p> <p>VL had a first-pass success rate of 74.2% compared to 43.8% for DL (<math>p &lt; 0.01</math>)</p>	<p>Strengths: Specific to paramedics intubating prehospitally</p> <p>Patient demographics and indications for intubation were similar between the patient groups for VL and DL.</p> <p>Average number of intubations performed annually per paramedic in study likely similar to local area.</p> <p>Weaknesses: Paramedics received ongoing training with VL after implementation but received no additional training for DL</p>



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					<p>The change in how intubations were reported by paramedics may have introduced a Hawthorne effect</p> <p>Retrospective PCR analysis presents limitations to generalizability</p>

**Comments:** While there may be some support that the implementation of video laryngoscopy for paramedics may improve first-pass success rates on intubation, prospective randomized control trials should be completed and factors such as continued education and training should be controlled. Another factor that may be important and were not considered in either study includes time to successful intubation.

**Consider:** It is unclear based on these studies whether the implementation of continual training with direct laryngoscopy would improve overall success rates and first-pass success rates to same level of success as VL.

**Clinical Bottom Line:** Prospective randomized control trials that control for education and ongoing training between VL and DL should be completed before a change in practice is considered.



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## **References:**

Jarvis, J. L., McClure, S. F., & Johns, D. (2015). EMS Intubation Improves with King Vision Video Laryngoscopy. *Prehospital Emergency Care*, 19(4), 482-489. doi:10.3109/10903127.2015.1005259

Savino, P. B., Reichelderfer, S., Mercer, M. P., Wang, R. C., & Sporer, K. A., (2017). Direct Versus Video Laryngoscopy for Prehospital Intubation: A Systematic Review and Meta-analysis. *Academic Emergency Medicine*, 24(8), 1018-1026. doi:10.1111/acem.13193

