

Paramedic – Evidence Based Medicine (P-EBP) Program

Paramedic CAT (Critically Appraised Topic) Worksheet

Title: In prehospital patients undergoing endotracheal intubation by EMS, does the use of a bougie on first attempts lead to improved survival when compared with the use of a stylet and ET tube.

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Clinical Scenario: “You arrive at a patient in respiratory failure who you have determined requires emergency intubation. You have the option of either using a stylet and ET tube or bougie for your first pass attempt. Knowing that attempts at intubation beyond the first are associated with poorer patient outcomes, which tool do you choose to give this patient the best chance at survival?”

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

Population: Out of hospital, non-Cardiac Arrest patients undergoing sedation facilitated intubation.

Intervention: First-pass attempts at intubation with a bougie.

Comparison: First-pass attempts at Intubation with a stylet and ET tube.

Outcome: Mortality.

Search Strategy:

"Intubation, Intratracheal"[Mesh] AND "Emergency Medical Services"[Mesh] AND (stylet[All Fields] OR bougie[All Fields] OR (Endotracheal[All Fields] AND tube[All Fields] AND introducer[All Fields]))

Search Outcome:

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Relevant Papers:

AUTHOR, DATE	POPULATION: SAMPLE CHARACTERISTICS	DESIGN (LOE)	OUTCOMES	RESULTS	STRENGTHS/ WEAKNESSES
Driver B. 2018	757 Emergency Department patients aged 18 years and over undergoing emergency endotracheal intubation	This is a randomized controlled trial with a Level 1 level of evidence.	<p>1st attempt intubation success (all pts)</p> <p>1st attempt intubation success (at least 1 difficult airway characteristic)</p> <p>1st attempt intubation success without hypoxemia</p> <p>1st attempt duration</p>	<p>98% success in bougie group (95%CI: 96% to 99%) vs. 87% success in ETT+stylet group (95%CI: 83% to 90%)</p> <p>96% success in bougie group (95%CI: 93% to 99%) vs. 82% success in ETT+stylet group (95%CI: 76% to 88%)</p> <p>85% in bougie group (95%CI: 81% to 89%) vs. 77% in ETT+stylet group (72% to 81%)</p> <p>39s in bougie group (29s to 52s) vs. 40s in ETT+stylet group (27s to 63s)</p>	<p>Strengths: Large sample size. Almost all subjects followed up with. Study followed PICO. RCT. Reported CIs.</p> <p>Weaknesses: Population was in ED, not prehospital Population was almost entirely given a neuromuscular blockade, rather than sedation facilitated Only a single ED centre studied.</p>
Driver B. 2017	543 Emergency Department patients aged 18 years and over undergoing Emergency	Retrospective, Observational study with a Level 2 level of evidence.	1st attempt intubation	95% in bougie group (95%CI: 93% to 97%) vs. 86% in ETT+stylet group (95%CI: 79% to 93%)	Strengths: Large sample size. Study followed PICO.



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	Endotracheal Intubation		1st attempt duration	40s in bougie group (95%CI: 39s to 42s) vs. 27s in ETT+stylet group (95%CI: 25s to 29s)	<p>Reported CIs.</p> <p>Weaknesses: Observational study.</p> <p>Reason for bougie use was not indicated.</p> <p>Missing data from video review.</p> <p>Population was in ED, not prehospital.</p> <p>Population was almost entirely given a neuromuscular blockade, rather than sedation facilitated</p> <p>Only a single ED centre studied.</p>
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Comments: A randomized prehospital trial would provide more evidence for or against bougie use for paramedics.

Consider: One may consider not changing practice based on this evidence because the studies do not specifically include prehospital providers and do not include patients undergoing sedation facilitated intubation as opposed to RSI. However, one may consider changing practice because the high-quality RCT provided suggests that a bougie first approach provides higher first-pass success rates with no significant difference in hypoxemia or intubation attempt time.



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Clinical Bottom Line: Using a bougie for all first-pass endotracheal intubation attempts improves success rates over an endotracheal tube and stylet and therefore leads to better patient outcomes.

References:

Driver BE, Prekker ME, Klein LR, et al. (2018). Effect of Use of a Bougie vs Endotracheal Tube and Stylet on First-Attempt Intubation Success Among Patients With Difficult Airways Undergoing Emergency Intubation: A Randomized Clinical Trial. JAMA. 319(21):2179-2189.

Driver B, Dodd K, Klein LR, et al. (2017). The Bougie and First-Pass Success in the Emergency Department. Ann Emerg Med. 70(4):473-478.e1.



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