CRITICAL REVIEW FORM:
THERAPY ARTICLES

Resident: **Date:**
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Citation:
Driver BE et al., **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. 2018 Jun 5;319(21):2179-**2189.**

Study Objective:
To compare first attempt intubation success facilitated by bougie vs the endotracheal tube and stylet

Study Methodology: Single-center randomized controlled ED trial at Hennepin County Medical Center in Minneapolis, MN. of consecutive patients undergoing ED intubation with a Macintosh blade on first attempt. Following intubation, patient characteristics including any difficult airway features (i.e., body fluids obscuring the laryngeal view, airway obstruction or edema, obesity, short neck, small mandible, large tongue, facial trauma, or cervical spine immobilization**)** were noted.

Primary outcome: first-attempt intubation success rate among patients with at least 1 difficult airway characteristic.

Secondary outcomes were hypoxemia, first-attempt duration, and esophageal intubation.

GUIDE	COMMENTS
I. Are the results valid?	
A. Did experimental and control groups begin the study with a similar prognosis	Yes, both difficult airway characteristics were evenly distributed between the two groups. (table 1)
1. Were patients randomized?	Yes, randomly assigned in permuted blocks of 2,4,6,8,10 in a 1:1 ratio before the start of the trial to undergo initial intubation attempt facilitated by bougie or endotracheal tube+stylet (2 strata to divide evenly those with obesity or cervical immobilization)
2. Was randomization concealed (blinded)? In other words, was it possible to subvert the randomization process to ensure that a patient would be "randomized" to a particular group?	Randomization was concealed up until moment of intubation (numbered, opaque envelopes) although there were inherent difficulties with blinding of intubation device

3. Were patients analyzed in the groups to which they were randomized?	Yes, the authors used an intention-to-treat model. they were analyzed for difficult airway characteristics (post-randomization subgroup analysis). All patients were analyzed in the group to which they were randomized.
4. Were patients in the treatment and control groups similar with respect to known prognostic factors?	Yes, tables 1 & 2 demonstrate good balance between patient characteristics. Obesity and c-spine immobilization were controlled by randomization
5. Were patients aware of group allocation?	No. Unconscious.
6. Were clinicians aware of group allocation?	Yes. Not possible to blind.
7. Were outcome assessors aware of group allocation?	Yes. They helped record post-intubation data.
8. Was follow-up complete?	Yes, to assess for complications related to intubation
What are the results ?	
1. How large was the treatment effect?	In patients with at least 1 difficult airway characteristic, first pass success rate was higher in the bougie (96%) vs. endotracheal tube/stylet (82%) Absolute risk reduction of 14%. NNT 1/ARR = 7 Among all patients, first-pass success was higher in the bougie group (98%) compared to the endotracheal tube + stylet group (87%): difference 8%, 95% CI 4 to 12%. There was no significant difference in the duration of the first intubation attempt between the bougie and endotracheal tube + stylet groups
2. How precise was the estimate of the treatment effect? (CI's?)	95% CI, 8%-20%

III **How can I apply the results to patient care?**	
1. Were the study patients similar to my patient?	**Yes, mean age 46 (young trauma patients, older cardiac arrests) and obesity (BMI at least 30) in 34% total patients. About 20% were trauma patients.**
2. Were all clinically important outcomes considered?	**Yes. First pass success, hypoxemia, duration** Not cost or economic analysis reported.
3. Are the likely treatment benefits worth the potential harm and costs?	**Yes, low cost difference outweighed by benefits of increased first pass success seems reasonable.**

Limitations:
Single institution with history of routine bougie use (experience plays a role), less generalizable

Difficult airway characteristics were based on subjective assessment before and during intubation (variable interpretation)

Could not stratify randomization by difficult airway characteristics because not all could be ascertained before intubation

Hyperangulated laryngoscope intubations were excluded (not generalizable in that sense), which would likely actually favor bougie

No difference in duration between groups when comparing all patients (slightly faster for bougie group when comparing those with difficult airway characteristics)

Clinical Bottom Line:

Based on this single-centered study, using a bougie may increase first pass success in patients with at least one difficult airway characteristic. The use of bougie in this patient population may advantage patients with faster time of intubation and lower incidence of hypoxemia.