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**Concept and design:** Adhikari, Spong.

**Acquisition, analysis, or interpretation of data:** All authors.

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## COMMENT & RESPONSE

### Use of a Bougie vs Endotracheal Tube With Stylet and Successful Intubation on the First Attempt Among Critically Ill Patients Undergoing Tracheal Intubation

**To the Editor** A recent randomized trial<sup>1</sup> comparing success rates in tracheal intubation with bougie vs endotracheal tube with

stylet found no difference in outcomes. This negative result raises several questions about which other measures might be helpful when intubating critically ill patients.

First, although the study was designed to evaluate bougie vs stylet techniques, the sensitivity analyses and supplemental data reveal other key insights. Use of video laryngoscopy was associated with a higher first-attempt success rate than direct laryngoscopy in both the bougie and the stylet groups. Inadequate glottic view accounted for 17 of 23 instances in which patients did not receive the intended intervention.<sup>1</sup> Prior studies have indicated that difficulty, multiple attempts, or delay during tracheal intubation underpin many cases of airway misadventure,<sup>2</sup> and systematic review indicates that video laryngoscopy improves ease and success of tracheal intubation, particularly if there is anatomical difficulty.<sup>3</sup> The present study<sup>1</sup> reinforces the vital importance of glottic visualization and the value of video laryngoscopy.

Second, the data from this study<sup>1</sup> also highlight the complexity of airway management and how context-dependent results may be. Although prior studies have suggested that bougie use might improve outcomes of patients with difficult airways, use of a bougie failed to improve first-attempt success in this study—even in patients with difficult airway characteristics or those whose larynx was incompletely visualized.<sup>1</sup> Key caveats are that urgent intubations and individuals with abnormal anatomy were excluded from enrollment in this study.<sup>1</sup> When a clinician encounters a difficult airway, which often requires urgent management, evidence-based algorithms are critical.<sup>4</sup> Furthermore, although not emphasized in this study, detection of exhaled carbon dioxide by waveform capnography remains the gold standard for confirming correct tracheal tube placement.

Third, teamwork during intubation is critical. Multidisciplinary teams are associated with improved first-attempt success rates and increased speed in securing difficult airways.<sup>5</sup> Although intubation requires procedural skill, successfully securing an airway is not a purely technical endeavor; it is predicated on a multipronged approach that includes effective team activation, coordinated response to events, and cooperation among physicians, nurses, respiratory therapists, and other health care professionals. We commend the authors on this valuable study<sup>1</sup> that challenges clinicians to identify opportunities to improve intubation outcomes and note that improvements require both optimal use of evidence-based tools and expert application of nontechnical skills.

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**To the Editor** The BOUGIE trial<sup>1</sup> showed that rates of successful first-attempt intubations with use of a bougie vs endotracheal tube with stylet were comparable during tracheal intubation for critically ill adults. However, we believe that the difference between the suitability of various laryngoscopes used with a bougie or a stylet could have affected the study results.

Table 2 in the article shows that 3 types of video laryngoscopes were used in this trial, and of all intubations, approximately 50% were performed with Storz C-MAC, 15% with McGrath MAC, and 7% with Glidescope. Although video laryngoscopes are beneficial for laryngeal visualization, tube delivery to the glottis is often difficult because of the non-alignment of oral, pharyngeal, and laryngeal axes, which forces the tube tip to pass around an acute angle to enter the larynx. However, since the Storz video laryngoscopes, including C-MAC and its antecedent (V-MAC), use the same Macintosh laryngoscope blade as direct laryngoscopy, they can decrease the need for stylet use.<sup>2</sup> On the other hand, McGrath MAC and Glidescope are inserted in the midline and advanced over the tongue, requiring stylet use.<sup>2</sup>

A previous randomized study showed that among patients with normal airways, Storz V-MAC had a higher first-pass successful intubation rate and a lower requirement for stylet use than McGrath MAC or Glidescope.<sup>2</sup> In another randomized study of tracheal intubation for patients with obesity, 76% of the McGrath MAC group and 60% of the Glidescope group required stylet use, compared with only 10% of the Storz V-MAC group.<sup>3</sup> Because the tongue tends to block smooth passage of a bougie, a bougie is not useful during indirect laryngoscopy with hyperangulated blades. The McGrath blade has a more significant anterior bend compared with the standard Macintosh blade and requires a tra-

cheal tube with stylet.<sup>4</sup> Moreover, the instruction manual for the McGrath MAC X-blade, which is used for difficult intubations, does not recommend bougie use.

In the BEAM trial,<sup>5</sup> which investigated the use of a bougie vs endotracheal tube and stylet on first-attempt intubation success among patients with difficult airways undergoing emergency intubation, more than 95% of intubations were performed with Storz C-MAC, which can be used with either a bougie or a stylet. We are therefore concerned about the higher percentage of stylet-favored video laryngoscopes (McGrath MAC and Glidescope) used during intubation in the BOUGIE trial.

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**In Reply** We agree with Dr Brenner and colleagues that the safe performance of emergency tracheal intubation involves both technical aspects (eg, glottic visualization) and non-technical aspects (eg, protocols, teamwork).<sup>1</sup> Multicenter randomized clinical trials should rigorously examine the drugs (eg, choice of induction agent), devices (eg, video laryngoscopes), techniques (eg, use of positive pressure ventilation for preoxygenation), and processes (eg, operator training and teamwork) used in emergency tracheal intubation to improve care and outcomes for critically ill adults.

Dr Kida and colleagues inquire about use of a stylet with different laryngoscope blade shapes. Historically, use of a stylet varied by region and operator training, with some operators believing that stylets were unnecessary and potentially harmful. However, a recent large trial demonstrated that use of a stylet safely increased the likelihood of successful intubation.<sup>2</sup> Therefore, operators using a standard-geometry

laryngoscope blade (ie, Macintosh or Miller) should use a stylet or a bougie for all intubation attempts, and operators using a hyperangulated laryngoscope blade should use a rigid stylet.<sup>3</sup>

The studies referenced by Kida and colleagues involved the hyperangulated Glidescope Ranger or hyperangulated McGrath Series 5, which are hyperangulated laryngoscope blades designed to be used with a rigid stylet.<sup>3</sup> The BOUGIE trial<sup>4</sup> excluded intubations using such hyperangulated blades. Only intubations using standard-geometry blades (in this trial, Storz C-MAC Macintosh, Glidescope MAC, and McGrath MAC blades) were eligible for use in our study.<sup>4</sup> Although these 3 video laryngoscope blades differ slightly in shape and ability to create a straight path for tube or bougie passage, they are sufficiently comparable that the concerns raised by Kida and colleagues are not relevant to our trial.

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## Selection, Effectiveness, and Adverse Effects of Contraception

**To the Editor** A recent Review<sup>1</sup> discussed the importance of an evidence-based approach and careful consideration of various factors when selecting optimal contraception. The authors identified oral contraceptive pills as the most commonly used reversible contraceptive and discussed some aspects of effectiveness and risks of these medications. Regarding cardiovascular risks, while the authors listed untreated hypertension as a contraindication for combined hormonal contraceptives (CHCs), they did not discuss that CHCs are US Medical Eligibility Criteria for Contraceptive Use (MEC) category 3 or 4 regardless of blood pressure control. These recommendations from the Centers for Disease Control and Prevention classify CHCs as a method for which

the risks mostly or entirely outweigh potential benefits for all women with hypertension. In addition, prior studies have shown that individuals with hypertension taking CHCs are at higher risk of acute myocardial infarction than those with hypertension who do not use CHCs.<sup>2</sup> Furthermore, women taking CHCs without hypertension at baseline had a higher risk of developing hypertension compared with women who never used CHCs in 4 years of follow-up.<sup>3</sup> Additionally, 2 cross-sectional studies showed that women with hypertension who used CHCs had higher systolic and diastolic blood pressure compared with those who did not use CHCs.<sup>2</sup> In contrast, progestin-only pills and long-acting contraceptive methods, which are MEC category 1 or 2, provide a safe alternative for women with hypertension, regardless of blood pressure control. Long-acting progestin-only or copper intrauterine devices and subdermal implants are also more effective contraceptives than CHCs, with less than 1 pregnancy per 100 individuals per year.<sup>1</sup>

Unintended pregnancy remains high (45%) in the US, making contraceptive shared decision-making important for women with hypertension.<sup>4</sup> Preventing unintended pregnancy allows time to switch to pregnancy-appropriate antihypertensive medication and avoids unnecessary adverse maternal and fetal outcomes.<sup>5</sup> Women with hypertension have high incidences of preeclampsia (26%), preterm birth (28%), and perinatal death (4%).<sup>5</sup> Therefore, we believe that the association between hypertension and CHCs, which raise blood pressure and increase risk of cardiovascular disease, should be stressed beyond stating that women with untreated hypertension are ineligible for CHCs. When selecting optimal contraceptive methods for a woman with hypertension, weighing the cardiovascular risks of CHCs should be a priority, especially because other safe and effective contraceptive methods are available.

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