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In Reply:

We thank Xue *et al.* as well as Healy for their interest in our work and for the excellent questions regarding our randomized controlled study, "Comparative effectiveness of the C-MAC video laryngoscope *versus* direct laryngoscopy in the setting of the predicted difficult airway."[1]

Xue *et al.* raised concerns regarding the training level that the providers had with the two devices tested. All providers were proficient in direct laryngoscopy and had exposure to the tested video laryngoscope before the commencement of the randomized controlled study. We agree that it would be also reasonable to design a study that exactly quantifies the prestudy experience with a device. Our study design aimed at comparing the clinical effectiveness of the two different airway management tools in a defined clinical challenge ("predicted difficult airway"). It is very well possible that with more clinical experience using the video laryngoscope, the performance with the device could have been optimized further. Therefore, we find it remarkable that despite less clinical experience as compared with direct laryngoscopy, the intubation success on first attempt was better with the new video laryngoscope. The data of this study suggest that the learning curve for video laryngoscopy is steep and the implementation of the new technology will offer immediate measurable benefit for the provider.

Xue *et al.* raise concerns about the sample size. The study design was based on a careful power analysis regarding the primary outcome. We reported all secondary outcomes in order to provide the reader and potential researchers in the field with additional information about the study population and clinical environment. Accordingly, we did not explore conclusions around the relative performance of resident anesthesiologists, attending anesthesiologists, or certified nurse anesthetists.

Xue *et al.* raise concerns that intubation failure in the video laryngoscopy group occurred secondary to an omission of a stylet from the endotracheal tube while approaching intubation. Although not explicitly mentioned in the method section of the publication, providers were guided to use a styleted endotracheal tube for the initial attempt, and asked to remove it if a gum–elastic bougie was used. We expected that intubation failure would occur with the use of the video laryngoscope despite an optimized laryngeal view, because it has been described in the literature before.[2,3] Although this is likely a multifactorial problem and for some providers may be related to the level of experience with the technique, the failure in this study was not because of lack of stylet use. Future research is poised to determine the nature of video laryngoscopy failure in the setting of an adequate laryngeal view.

Healy expresses concerns about the definition of "difficult airway" in our study. He points to the heart of the problem when he calls the clinical practice of airway assessment at the bedside before anesthesia of limited predictive value. Yentis has contributed an outstanding dissection of the dilemma that our field is facing in this regard.[4] Although bedside tests may have a reasonable negative predictive value, providers have few tools to guide their care when these predictors do exist. For the most concerning airways, preserving spontaneous ventilation is appropriate, and we encourage the practitioners to maintain appropriate equipment and skills available for this very vulnerable patient population, as Healy suggests.

Healy also suggests that clinical research that aims at identifying the role of particular airway management solutions should take into consideration the outcome of multiple intubation attempts. The design of our study was guided by the goal to determine which of the two tested devices provides the best first-attempt success and therefore can be suggested to the practitioner as the most effective first choice to successfully intubate a patient with a suspected difficult airway according to the preanesthesia assessment. The result of the study now suggests using video laryngoscopy as the best first choice in such situations, and thereby has important clinical implications for the day-to-day practice in anesthesiology.

Healy also raised concerns that the study was not blinded for the providers. We see no alternative to this study design, as in other research that involves manual techniques. We determined objective criteria that demonstrated that the gum–elastic bougie and external laryngeal manipulation were less frequently applied when the case was randomized to the video laryngoscope system. A gum–elastic bougie facilitated eight endotracheal intubations in the video laryngoscopy group and 14 in the direct laryngoscopy group. We conclude from this data that the video laryngoscope requires less frequent use of airway adjuncts likely related to the improved laryngeal view achieved as demonstrated in our study.

Healy suggests studying the known difficult airway separately. We agree that more evidence would help to determine the optimal techniques for managing the known difficult airway. Although we support conducting randomized clini-

cal studies, we believe that this topic would benefit from carefully conducted retrospective data analysis as in most practices respective cases are rare.

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Tracheal Intubation Performed with GlideScope® Video Laryngoscope and Direct Laryngoscopy in Neonates and Infants

To the Editor:

Fiadjoe *et al.*[1] should be applauded for their efforts in comparing the performance of the GlideScope Cobalt® video laryngoscope (GCV) (Verathon Medical, Bothell, WA)‡ with the Miller laryngoscope (Heine, Dover, NH) for tracheal intubation in neonates and infants with a normal airway. Quite rightly, the primary outcomes of this study are intubation time and success rate with the two devices. However, there are several issues of the study that need to be clarified.

The authors did not indicate how many of the neonates aged younger than 1 month and the infants aged 1–12 months were included in each group. Is a size 1 Miller blade the best selection for all patients in the direct laryngoscopy group? In our experience, a size 0 Miller blade is more useful than a size 1 Miller blade in the neonates. In the GCV group, a size 2 blade of the GCV was selected. However, an important issue ignored by the authors is bodyweight range of patients. The GCV is a single-use version of the original GlideScope® video laryngoscope. The most important improvement in the GCV is the availability of a 10-mm blade, compared with 14.5 mm in original models.[2] As yet, there are five disposable blades of the GCV available. In the manufacturer's description, the blade choice of the GCV is based on bodyweight of patients. The recommended blade sizes are size 0 for patients weighing less than 1.5 kg, size 1 for patients weighing 1.5–3.6 kg, size 2 for patients weighing 1.8–10 kg, size 3 for patients weighing 10 kg, or adults, and size 4 for patients weighing 40 kg, or morbidly obese patients. Because each blade covers a wide bodyweight range and the infant's airway is typically 3 or 4 mm in diameter, the laryngoscopic view of the GCV may vary with the size of the blade.

The authors compared the percentage of glottic opening score obtained by the two devices, and demonstrated that the GCV yielded a better laryngoscopic view than the Miller laryngoscope. We were also very interested in the use of maneuvers to aid laryngoscopy in this study, especially for the use of optimum external laryngeal manipulation. It is generally recommend that optimum external laryngeal manipulation should be used with a poor laryngoscopic view in order to improve visualization with direct laryngoscopy.[3] Benumof and Cooper[4] demonstrated that optimum external laryngeal manipulation may improve the laryngoscopic view by at least one whole grade in adults. Smilarly, this maneuver has proved effective for direct laryngoscopy in pediatric patients.[5] In the clinical studies comparing performance of Glidescope® video laryngoscope with direct laryngoscope for tracheal intubation in pediatric patients with normal and difficult airways,[6,7] optimum external laryngeal manipulation has also been shown to provide improved laryngoscopic view. In methods, we do not feel that the authors clearly described if they had adopted an optimal-best attempt at laryngoscopy when evaluating the best views obtained with the two laryngoscopes.

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