

Time for the Department of Defense to Field Video Laryngoscopy Across the Battlespace

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The *New England Journal of Medicine* recently published a prospective, randomized controlled trial by Prekker et al., “Video versus direct laryngoscopy for tracheal intubation of critically ill adults,” funded by the Defense Health Agency.¹ Patients presenting to emergency departments and intensive care units requiring emergent tracheal intubation were randomly assigned to either video laryngoscopy (VL) or direct laryngoscopy (DL) on the first attempt. The trial stopped early after a pre-planned interim analysis demonstrated clear superiority of VL over DL for first-pass success (final results [n=1,417]: 85.1% VL vs. 70.8% DL, $p < .001$). The accompanying invited editorial suggests that VL should be available in all treatment areas with intubation capability.² This is not the first clinical trial to assess these two emergency airway management interventions, but it does represent the largest and most robust to date.^{3,4}

According to the North Atlantic Treaty Organization (NATO) definitions, most data show that tracheal intubation is the most common airway intervention in the Role 1 phase of care (including temporary, forward-staged aid station settings), far outpacing cricothyrotomy and extraglottic airway placement (as we previously reported).⁵⁻⁸ While it is not feasible to randomly assign combat casualties to immediate versus delayed intubation, the authors’ best available data demonstrated higher mortality among those undergoing intubation in the Battalion Aid Station (BAS) Role 1 setting; our finding persisted when adjusting for confounders, including mechanism of injury and injury severity score.⁹⁻¹¹ The authors could not determine the success rates of Role 1 endotracheal intubation or if there was a requirement to transition to supraglottic airway for failed endotracheal intubation attempts. These previous studies suggest that if we implement an intervention to improve outcomes for casualties requiring airway interventions, the BAS Role 1 setting offers the greatest opportunity for improving patient outcomes, given the critical nature and need for early intervention. Further, the authors’ recent assessment of trends suggests that they have not materially affected outcomes among casualties requiring prehospital intubation in nearly two decades of combat.¹²

Currently, the Medic Enhancement Set (MES) for the BAS Role 1 does not include VL technology. Neither do Brigade and Area Support Medical Companies (BSMC, ASMC) comprising Role 2 facilities for maneuver forces. The MES for Forward Resuscitative Surgical Detachments in the Army includes video laryngoscopes as Associated Support Items of Equipment. However, these items remain strictly as developmental line-item numbers. To the authors’ knowledge, there has yet to be an established timeline for full procurement and fielding across the Force. Current modified tables of organization and equipment (MTOE) for contemporary Role 3 organizations (e.g., Field Hospitals) are in the same situation. Historical VL device materiel solutions (e.g., GlideScope) are no longer serviceable by the manufacturer; as the technology malfunctions, no replacement exists. Even if we identify a solution to replace the aging GlideScope devices, that only solves the challenge for Role 3, which already has assigned residency-trained emergency medicine physicians, anesthesiologists, and certified registered nurse anesthetists (as the authors and others have described).^{5,13}

Role 1 field and semi-fixed facility staffing pose distinct challenges that increase the need for VL capability. The providers and configuration of the Role 1 aid station vary based on the service, unit, mission, and operational environment. A Role 1 aid station typically has one medical officer leading the team. This guideline may be modified, leaving only enlisted medical personnel trained at the level of an emergency medical technician. The training of the medical officer varies, ranging from a newly trained physician assistant to general medical officers (one-year general internship post-graduate) or a non-emergency medicine residency-trained physician (family medicine or pediatrics trained). The common thread within these staffing models is a lack of medical officers with advanced airway training. The American College of Graduate Medical Education (ACGME) requires that emergency medicine residents have at least 35 successful intubations to graduate; however, data suggest that 50 is a reasonable volume for competency (as noted by others and authors in a recent opinion).^{14,15} ACGME does not have direct requirements for sustainment training,

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which is another challenge. Such training volumes are not feasible in a pre-deployment, just-in-time training model, and deploying medical officers to these roles with inadequate training is unacceptable. Indeed, first-pass success with VL is superior to that with DL at all levels of training, but the difference is more pronounced among operators with less intubation experience.¹⁶ This finding was even more pronounced when assessing relatively novice intubators, which is relevant to the early resuscitative trauma mission for the deployed Military Healthcare System. Novice intubators (<25 reported intubations) using VL had similar first-pass success to experienced intubators (>200 intubations) using DL in the Prekker study.¹ In other words, VL technology can close the gap between novice and experienced intubators. The need for materiel solutions to optimize airway management among less experienced medical officers will only accelerate if the U.S. military enters large-scale combat operations (LSCO), given the physician supply and demand mismatch to the massive number of patients that would occur (as the authors previously described).¹⁷

VL technology represents a prudent stop-gap measure that the U.S. military must implement before the next conflict occurs to ensure adequate contracting, logistical support, and fielding. The Prekker study noted a number needed to treat (NNT) of seven, meaning that for every seven patients undergoing intubation with a VL device, one will derive benefit. We can apply this NNT to real-world data. For example, lack of first-pass success substantially increases the risk of hypoxic and other cardiovascular events; a recent systematic review found that nearly one in three emergency intubations are at risk for such events.¹⁸ The authors' recent study assessing Role 1 interventions from 2007 to 2019 found that of the 25,849 casualties, 1,147 were intubated prehospital.¹⁹ Using the NNT, 164 casualties would have derived direct benefit from VL intervention. The number is likely far greater, given the ongoing challenges with prehospital data capture that the authors have previously described.^{20,21} A data-driven approach to medical planning supporting current irregular warfare missions and future LSCO missions leaves no question: the Department of Defense needs to prioritize the fielding video laryngoscopy for acute airway intubations.

Author Contributions

SGS performed the initial drafting and the revisions. The remaining authors provided critical revisions and key subject matter expertise. All authors contributed substantially to this editorial. All authors read and approved the final manuscript.

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