The Journal of Emergency Medicine, Vol. 48, No. 5, pp. 613–619, 2015

0736-4679/$ - see front matter

ELSEVIER

http://dx.doi.org/10.1016/j.jemermed.2014.12.029

Education

DO EMERGENCY MEDICINE RESIDENTS RECEIVE APPROPRIATE VIDEO LARYNGOSCOPY TRAINING? A SURVEY TO COMPARE THE UTILIZATION OF VIDEO LARYNGOSCOPY DEVICES IN EMERGENCY MEDICINE RESIDENCY PROGRAMS AND COMMUNITY EMERGENCY DEPARTMENTS

Anand Kumar Swaminathan, MD, MPH, Rachel Berkowitz, MD, Annalee Baker, MD, and Meghan Spyres, MD

Department of Emergency Medicine, New York University School of Medicine/Bellevue Hospital, New York, New York
Reprint Address: Anand Kumar Swaminathan, MD, MPH, Department of Emergency Medicine, New York University School of Medicine/Bellevue Hospital, 462 1st Ave., OBV-A341, New York, NY 10016

☐ **Abstract—Background: Video laryngoscopy (VL) has emerged as a critical tool in the "difficult airway" armamentarium of emergency physicians. The resultant increase in the types of available VL devices has made Emergency Medicine Residency (EMR) training in VL increasingly challenging. Additionally, the prevalence of VL devices in the community is unknown. Because Emergency Medicine (EM) residents go on to work in diverse settings, many in non-EMR emergency departments (EDs), it is preferable that they receive training on the airway modalities they will encounter in practice. Objective: To compare the prevalence and type of VL devices in EMR programs to non-EMR EDs. Methods: This was a survey study conducted from July 2012 to October 2012 of Accreditation Council for Graduate Medical Education-accredited, MD EMR programs in the United States and non-EMR EDs in New York State. A chi-squared test was performed to determine whether the difference in VL prevalence was significant. Results: There were 158 EMR programs and 132 non-EMR EDs surveyed; 97.8% of EMR and 84.3% of non-EMR EDs reported having some form of VL in their departments. The difference in proportion of EMR vs. non-EMR EDs that have VL was $\chi^2 = 13$ ($p < 0.001$). The Glidescope® device (Verathon Medical, Bothell, WA) was present in 87.7% of EMR programs and 79.3% of non-EMR EDs. Conclusions: The majority of EMR programs trained residents in VL. The Glidescope device was used most frequently. Non-EMR EDs in New York State had a lower presence of VL devices, with the Glidescope device again being the most common. These results demonstrate that VL is pervasive in both practice environments.** © 2015 Elsevier Inc.

☐ **Keywords—airway; video laryngoscopy; direct laryngoscopy; Glidescope; resident education**

INTRODUCTION

Direct laryngoscopy (DL) represents the conventional approach to intubation in the emergency department (ED). For many years, Emergency Medicine Residency (EMR) programs have focused resident airway training on developing DL skills. Over the last decade, various video laryngoscopy (VL) devices have emerged and are being used with increasing frequency in both EMR programs and non-EMR EDs (1–7). Whereas DL requires alignment of the pharyngeal, laryngeal, and tracheal

The work contained in this paper was presented at the Society of Academic Emergency Medicine (SAEM) Mid Atlantic Regional Conference on February 2, 2013 in Washington, DC; the SAEM NorthEast Regional Conference on April 3, 2013 in Providence, RI; the SAEM National Conference on May 17, 2013 in Atlanta, GA; and the Council of Residency Directors Conference on March 7, 2013 in Denver, CO.

This study was approved by the NYU Institutional Review Board.

Received: 17 May 2014; Final submission received: 30 October 2014;
Accepted: 21 December 2014

axes for proper endotracheal tube placement, VL does not. VL devices incorporate a video camera on the undersurface of the blade that transmits an image to a video monitor, providing the operator and observers an indirect view of the glottic opening. Additionally, there are a number of distinct commercially available VL devices with unique technical features.

All VL devices are not created equal. Many of the devices use different optics, blade angles, laryngoscope handles, and monitors. A full discussion of the differences between these devices is beyond the scope of this article and can be found in prior publications (8). These key design differences require the operator to employ different techniques to achieve an optimal glottic view (9). As a result, EMR programs must tailor airway training toward the VL devices available in their EDs. EMR programs also have a duty to train their residents to use DL, as VL may not always be present in the EDs they work in after graduation. The majority of emergency medicine graduates will practice in non-EMR EDs. Knowledge of the prevalence and type of VL in non-EMR EDs (in addition to EMR EDs) can aid in developing an appropriate airway-training curriculum. To our knowledge, no study has reported this information.

MATERIALS AND METHODS

Study Design

This was a survey study. The survey design was selected because it was the most efficient way to discover the information in question. United States EMR programs and New York State non-EMR EDs were surveyed separately. EMR programs were identified from the list of Accreditation Council for Graduate Medical Education (ACGME)-accredited EMR programs across the country. To survey EMR programs, an Internet-based survey through SurveyMonkey (SurveyMonkey Inc., Palo Alto, CA) was distributed to EMR directors and assistant residency directors. Multiple sites within an EMR were accounted for and included only once in the study. An electronic link was sent via e-mail to all 158 ACGME-accredited EMR programs nationwide. The survey was open for completion from July 1, 2012 to October 1, 2012.

Non-EMR EDs were defined as those in which no EM residents worked. To survey New York State nonacademic EDs, we generated a list of non-EMR EDs from New York State Department of Health data. EDs were then contacted directly by a study investigator for phone interviews. Non-EMR EDs were interviewed by phone because we were unable to find reliable e-mail addresses through which to contact these facilities. Phone interviews took place between August 24, 2013 and October 30, 2013.

Participation in this study was not incentivized or compensated. This study protocol was approved under exempt status by our institution's institutional review board.

Survey Instrument

Two separate surveys were created by study investigators, which consisted of an assistant program director and three senior EM residents. The survey was designed to answer three distinct questions surrounding the use of VL in EMR and non-EMR EDs. The SurveyMonkey tool used for EMRs and the phone survey used for non-EMR EDs contained the same core questions. The non-EMR directed phone survey included one initial question to confirm the absence of an EMR training program at that hospital. The non-EMR ED survey is shown in Figure 1.

The EMR survey included several supplemental questions to determine postgraduate year training levels and satellite locations receiving residents to prevent duplicates (Figure 2). The study was piloted among several EM physicians at our institution.

Key Outcome Measures

The primary purpose of this survey study was to identify the presence or absence and type of video laryngoscopes in EMR programs across the country and non-EMR EDs in New York State. The secondary endpoints of this study were to investigate the percentage of EMR programs with dedicated video laryngoscopy training curricula, and the presence of video laryngoscopy quality assurance (QA).

Data Analysis

A chi-squared test was used to determine whether the difference in presence of video laryngoscopy amongst EMR and non-EMR programs was significant. Statistical significance was defined as $p < 0.05$. Sample size calculation was not performed.

RESULTS

At the time of the study, there were 158 ACGME-accredited EMR programs in the United States. All were surveyed, and 138 (87.3%) responded. A list of 132 non-EMR EDs was generated from the New York State Department of Health database. All were surveyed and 121 (91.7%) participated.

Of the 138 EMR responders, 135 (97.8%) reported having some form of VL in their EDs. Among non-EMR ED responders, 102 of the 121 (84.3%) reported having VL. The difference in proportion of EMR vs. non-EMR EDs that have VL was $\chi^2 = 13$ ($p < 0.001$).