Laryngoscopy Practices

2013 Survey Report
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Laryngoscopy in the U.S.
840,000 Unexpected Difficulties

The American Society of Anesthesiologists (ASA) recommends that clinicians evaluate patients in order to be prepared for difficult airways,¹ but not every difficult airway can be identified ahead of time.² How big of a problem are unanticipated difficult airways? Do factors like hospital size or hospital setting change the percentage of unanticipated difficult airways clinicians report encountering? And how well-equipped are hospitals for these unexpected problems?

To begin understanding the magnitude of the problem posed by unanticipated difficult airways, we surveyed 570 medical professionals in the U.S. (Figures 1-4)—46% CRNAs and 50% anesthesiologists (Figure 4). The median percentage of difficult laryngoscopies reported was 10%, with a little less than half (4%) unexpected difficult laryngoscopies (Figure 5). While 4% may sound like a low-incidence, this translates into more than 840,000 unanticipated difficult laryngoscopies in the U.S. each year.*

Based on the median number of intubations our respondents reported performing each week (Figure 6), suburban hospitals and large hospitals (>300 beds) are seeing the most of these unanticipated events, at approximately 328,000 (suburban hospitals) and approximately 330,000 (large hospitals).

Despite the high number of unanticipated difficult laryngoscopies, most individual operating rooms (ORs) do not have the latest equipment designed to deal with difficult airways. Instead, most share tools like video laryngoscopes, fiber-optic scopes, and light wands (Figure 7).

With the growing availability and reduction in cost of new technologies for managing difficult airways, clinicians may want to re-examine how ready and well-equipped they are for the unexpected.

*Based on an estimated 21M laryngoscopies performed annually.
Survey Methodology

We sent an email requesting participation in our survey on intubation practices and tool availability to 12,000 anesthesiologists and 10,000 CRNAs in the U.S. This survey was conducted as an online questionnaire. 808 respondents viewed our survey, 664 started our survey, and 570 answered the majority (70%) of the survey questions.

To find out if the reported percent of difficult airways or unexpected difficult airways was greater in specific populations, we tested for statistical significance using either a Wilcoxon rank sum test (comparison of only two groups) or a Kruskal-Wallis rank sum test (comparison of more than two groups). Groups were deemed not significantly different for p-value > 0.05.
Survey Findings

Demographics

Figure 1. Distribution of respondents by community setting

- Urban (n=332) 59%
- Suburban (n=172) 30%
- Rural, (n=63) 11%

Figure 2. Distribution of respondents by hospital size

- > 300 beds (n=330) 55%
- 101-300 beds (n=179) 30%
- 1–100 beds, (n=88) 15%

Figure 3. Distribution of respondents by anesthesiology team size

- > 41 people (n=263) 49%
- 26-40 people (n=108) 19%
- 1-10 people (n=108) 17%
- 11-25 people (n=101) 19%

Figure 4. Distribution of respondents by role

- CRNA (n=273) 50%
- Anesthesiologist/Chief Anesthesiologist (n=260) 46%
- Other, (n=10) 4%
Survey Findings

Prevalence of Difficult and Unanticipated Difficult Airways

Survey respondents were asked to report on the percentage of difficult and unanticipated difficult airways they estimate seeing each year (Figure 5). There was surprisingly very little difference in the reported incidence of difficult and unanticipated difficult airways across different demographics. The overall median percent of difficult airways reported is 10%, and unanticipated difficult airways is 4%.

CRNAs reported slightly more unanticipated difficult airways (5%) than MDs (3%, Figure 5A), and smaller hospitals reported slightly fewer difficult airways (6%) than medium- and large-sized hospitals (10%, Figure 5C).

With approximately 21 million laryngoscopies performed each year in the U.S., these percentages project to approximately 2.1 million difficult laryngoscopies and approximately 840,000 unanticipated difficult laryngoscopies each year.

![Figure 5: Median reported percent difficult and unanticipated difficult airways by role (A), community setting (B), and hospital size (C). The only significant differences are that CRNAs report more unanticipated difficult airways than MDs (5% versus 3%, p-value = 0.004967) and respondents from the smallest hospitals report fewer difficult airways than larger hospitals (6% from smallest hospitals compared to 10% from both medium- and large-sized hospitals, p-value = 0.001096).]
Survey Findings

Intubation Practices

The median reported number of intubations per week varies by role and hospital size, and somewhat by hospital setting (Figure 6). MDs report more intubations per week than CRNAs (Figure 6A). Respondents from rural hospitals report fewer intubations per week than respondents from both suburban and urban hospitals (Figure 6B), although the difference between suburban and urban hospitals is not significant at a 95% confidence level (p-value = 0.3417).

Lastly, respondents from small hospitals (1 to 100 beds) report fewer intubations than those from medium-sized hospitals (101 to 300 beds) and respondents from medium-sized hospitals report fewer intubations per week than respondents from large hospitals (over 300 beds, Figure 6C).

A. Median Reported Number of Intubations per Week by Role

B. Hospital Community Setting

C. Hospital Size

Figure 6. Median reported number of intubations per week by role (A), hospital community setting (B), and hospital size (C). (A) CRNA compared to MD p-value = 5.804e-15. (B) Rural compared to suburban p-value = 0.0005313, rural compared to urban p-value = 0.002037, suburban compared to urban p-value = 0.3417. (C) 1 to 100 bed hospitals compared to 101 to 300 beds, p-value = 0.0007342, 101 to 300 beds compared to over 300 beds p-value = 0.0007342.
Survey Findings

Availability of Tools in U.S. ORs

Despite a projected incidence of 840,000 unanticipated difficult airways yearly in the U.S., most ORs rely on shared equipment to manage these unavoidable surprises (Figure 7). While the majority of respondents reported that they had access to equipment like video laryngoscopes (92%), only 3% of respondents had video laryngoscopes in every OR in their facility (Figure 7).

Figure 7. Intubation equipment availability overall, n = 453. LMA = laryngeal mask airway, EDL = enhanced direct laryngoscope, ILM = intubating laryngeal mask, LW = light wand, RFO = rigid fiber-optic scope, VL = video laryngoscope, and FFO = flexible fiber optic scope.
Conclusion

Are Clinicians Ready for the Unexpected?

While there is current literature that discusses the effectiveness of different evaluation criteria for identifying and managing difficult airways,¹ there are few recent studies that explore the prevalence of this issue.³,⁴ To understand how much of an impact unanticipated difficult airways have on anesthesiology healthcare practitioners (HCPs), we conducted a survey, reaching out to 570 anesthesiology HCPs.

Our findings are consistent with a seemingly low level of unanticipated difficult airways, at a reported rate of 4% of yearly cases occurring fairly uniformly across different demographics. But considering that more than 21 million laryngoscopies are performed each year in the U.S., this low percentage translates into a large number of unanticipated difficult airways—a projected value of roughly 840,000 encountered each year.

When this number is coupled with our finding that most ORs share equipment designed to deal with difficult airways, we conclude that there are almost 1 million times each year when an anesthesiology team member encounters a difficult airway, for which the team member may be unprepared and/or may not have immediate access to proper equipment.

With the availability of newer technology designed to deal with difficult airways, clinicians may want to re-evaluate how ready and well-equipped they are for the unexpected when it comes to airway management.
References


