First-Attempt Success Between Anatomically and Physiologically Difficult Airways in the National Emergency Airway Registry

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BACKGROUND: In the emergency department (ED), certain anatomical and physiological airway characteristics may predispose patients to tracheal intubation complications and poor outcomes. We hypothesized that both anatomically difficult airways (ADAs) and physiologically difficult airways (PDAs) would have lower first-attempt success than airways with neither in a cohort of ED intubations.

METHODS: We performed a retrospective, observational study using the National Emergency Airway Registry (NEAR) to examine the association between anticipated difficult airways (ADA, PDA, and combined ADA and PDA) vs those without difficult airway findings (neither ADA nor PDA) with first-attempt success. We included adult (age \geq 14 years) ED intubations performed with sedation and paralysis from January 1, 2016 to December 31, 2018 using either direct or video laryngoscopy. We excluded patients in cardiac arrest. The primary outcome was first-attempt success, while secondary outcomes included first-attempt success without adverse events, peri-intubation cardiac arrest, and the total number of airway attempts. Mixed-effects models were used to obtain adjusted estimates and confidence intervals (CIs) for each outcome. Fixed effects included the presence of a difficult airway type (independent variable) and covariates including laryngoscopy device type, intubator postgraduate year, trauma indication, and patient age as well as the site as a random effect. Multiplicative interaction between ADAs and PDAs was assessed using the likelihood ratio (LR) test.

RESULTS: Of the 19,071 subjects intubated during the study period, 13,938 were included in the study. Compared to those without difficult airway findings (neither ADA nor PDA), the adjusted odds ratios (aORs) for first-attempt success were 0.53 (95% CI, 0.40–0.68) for ADAs alone, 0.96 (0.68–1.36) for PDAs alone, and 0.44 (0.34–0.56) for both. The aORs for first-attempt success without adverse events were 0.72 (95% CI, 0.59–0.89) for ADAs alone, 0.79 (0.62–1.01) for PDAs alone, and 0.44 (0.37–0.54) for both. There was no evidence that the interaction between ADAs and PDAs for first-attempt success with or without adverse events was different from additive (ie, not synergistic/multiplicative or antagonistic).

CONCLUSIONS: Compared to no difficult airway characteristics, ADAs were inversely associated with first-attempt success, while PDAs were not. Both ADAs and PDAs, as well as their interaction, were inversely associated with first-attempt success without adverse events. (Anesth Analg 2024;138:1249–59)

KEY POINTS

- **Question:** Are both anatomically and physiologically difficult airways associated with firstattempt success during emergent tracheal intubation in the emergency department?
- Findings: Patients with anatomically difficult airways had lower first-attempt success, while those with physiologically difficult airways did not; however, patients meeting the definition of either or both difficult airway types had lower first-attempt success without adverse events.
- **Meaning:** Anatomically and physiologically difficult airways were associated with worse tracheal intubation outcomes in the emergency department.

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The authors declare no conflicts of interest.

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linicians encounter multiple challenges during emergency airway management.¹ In addition • to equipment-, environment-, and team-based factors, certain patient characteristics are associated with challenging airway management and are used to define the "difficult airway."2 Difficult airway characteristics may impact 1 or more components of emergency airway management, including oxygenation and ventilation, laryngoscopy, and tracheal intubation.^{1,2} These characteristics are traditionally anatomical, such as a high Mallampati class (eg, class 4), reduced mouth opening, and reduced thyromental distance.^{1,3} However, while anatomical characteristics signify the risk of airway management complications,⁴ preintubation physiological characteristics such as hypotension and hypoxemia are also associated with airway management complications in acute care settings.5-7

The association between physiological characteristics and poor intubation outcomes highlights a particular challenge in emergency airway management, the "physiologically difficult airway" (PDA).^{2,8,9} While prior work has associated physiological characteristics such as preintubation hypotension and hypoxemia with severe peri-intubation complications such as cardiac arrest,^{5,6,10–12} little work has been performed on the relationship and interaction between anatomical and physiological factors on intubation complications in the emergency department (ED).⁷ A retrospective, single-site study of 1513 ED intubations by Pacheco et al⁷ estimated that first-attempt success without adverse events decreased by 10.3% with anatomically difficult airways (ADAs), 10.7% with PDAs, and 21.4% with combined ADAs and PDAs compared to patients without any difficult airway characteristics.

However, aside from being single-site, the Pacheco et al⁷ study had some limitations. First, the study was limited by its single composite outcome in the adjusted analysis - first-attempt success without adverse events.7 While this outcome addresses both the success and safety of intubation, it is unclear how ADAs and PDAs contribute to the components of this outcome. For example, although in theory, PDAs might increase adverse effects without reducing first-attempt success alone, physiological characteristics like the inability to adequately preoxygenate could compromise first-attempt success. This compromise may result from reducing safe-apnea time thereby impairing glottic visualization, which may be a mechanism for reducing first-attempt success.^{13,14} Therefore, in this example, it is unclear if PDAs had lower first-attempt success without adverse events by contributing to adverse events or reduced firstattempt success.7 Furthermore, obesity was evaluated solely as an ADA characteristic despite evidence that it reduces safe-apnea time (physiological mechanism)^{13,15} in addition to increasing difficult laryngoscopy (anatomical mechanism).¹⁶

Our objective, determined a priori, was to examine the difference in first-attempt success between anticipated difficult airways (ADAs alone, PDAs alone, and combined ADAs and PDAs) and those without difficult airway characteristics (neither ADAs nor PDAs) using a multicenter registry of ED intubations. We hypothesized that both difficult airway types would be inversely associated with first-attempt success.

METHODS

Study Design and Setting

We retrospectively analyzed the National Emergency Airway Registry (NEAR). The most current iteration of NEAR contains intubation data from 25 academic and community EDs and has been described previously.¹⁷ Before participating, ethical approval was obtained from each site's respective institutional review boards and the requirement for written informed consent was waived.

Data Collection

Clinicians submitted intubation data using online forms (StudyTRAX; version 3.47.0011; ScienceTRAX). Study personnel excluded data from sites that submitted completed forms for <90% of intubations performed. Data included intubations performed between January 1, 2016 and December 31, 2018.

Study Population

We included subjects ≥14 years of age undergoing orotracheal intubation with rapid sequence intubation (ie, with both sedation and paralysis) with direct or video laryngoscopy. We excluded cases in cardiac arrest at the time of the first intubation attempt, which would confound the evaluation of peri-intubation cardiac arrest as a secondary outcome. First-attempt intubations using intubating laryngeal mask airways, bronchoscopes, digital intubation, and nonorotracheal routes (ie, nasal and surgical airways) were excluded, since these are infrequently performed in the ED and often indicative of atypical circumstances, such as the use of the nasal route for bronchoscopyassisted intubation.^{18,19} Pediatric cases were excluded, since blood pressure is age-specific, and preintubation systolic blood pressure was collected categorically in the registry with adult-specific cutoffs (Supplemental Digital Content, Supplemental Table 1, http://links. lww.com/AA/E699).

Variables

We collected patient characteristics, intubator characteristics, intubator assessments/findings, and intubation management variables. Patient characteristics included patient age, body habitus, and sex. Clinician

characteristics included postgraduate training level. Intubator assessments/ findings included intubation indications (eg, trauma, shock), difficult airway tests (ie, Mallampati class, mouth opening, thyromental distance), difficult airway findings (ie, reduced neck mobility, blood in the airway, airway obstruction, angioedema), facial trauma, neck trauma, preintubation hypoxemia, preintubation hypotension, and intubator impression of difficulty. Intubation management variables included apneic oxygenation, bougie use on the first attempt, external laryngeal manipulation (ie, BURP - backward, upward, rightward, and posterior pressure), preoxygenation time, paralytic medication, induction medication, vasopressor use on the first attempt, preoxygenation device, and laryngoscopy device, direct (DL) or video (VL) laryngoscopy. Additional details on variable coding are presented in the supplement (Supplemental Digital Content, Supplemental Table 1, http://links.lww.com/AA/ E699).

We defined difficult airway type, the independent variable, using mechanistic theory. Variables defining ADAs and PDAs were considered if available in NEAR, may contribute to difficult intubation or poor intubation outcomes, and apparent before induction (Table 1). For example, airway obstruction may obscure laryngeal views; therefore, airway obstruction may make intubation anatomically difficult. However, preintubation hypoxemia may increase the risk of postinduction hypoxemia limiting safe-apnea time; therefore, preintubation hypoxemia may make the intubation physiologically difficult. Therefore, we reported difficult airway types as those with no difficult airway findings, ADAs alone, PDAs alone, or findings of both ADAs and PDAs. Additional details on the coding of variables used for the difficult airway definitions are presented in the supplement (Supplemental Digital Content, Supplemental Table 1, http://links.lww.com/AA/E699).

Since obesity may mechanistically impair laryngeal views and safe-apnea time,^{13,15,16} we classified all obese patients as combined ADA and PDA. To support this decision, we performed a mediation analysis. A mediation analysis explores the indirect effect of a mediator between the independent variable of interest and the dependent variable, within the causal pathway.^{20,21} In contrast, confounders affect the independent and dependent variables from outside the causal pathway.²¹ Therefore, we performed a mediation analysis to inspect whether the effect of obesity/ morbid obesity on first-attempt success might be mediated via poor glottic view (anatomic mediator) and/or postinduction hypoxemia (physiological mediator), which supported our decision to use obesity/ morbid obesity as both an ADA and PDA characteristic (Table 1). Additional details on the mediation analysis are presented in the supplement.

Outcomes

Since first-attempt success is a commonly selected end point for ED intubation studies and repeat attempts are associated with severe complications including peri-intubation cardiac arrest,²²⁻²⁶ we chose first-attempt success *a priori* as the primary outcome. We considered first-attempt success without adverse events as a primary outcome; however, postinduction hypoxemia and hypotension may have been due to persistent preintubation hypoxemia and hypotension rather than a consequence of the intubation. This concern was due to the absolute definitions of these adverse effect variables in the registry where an Spo₂ of <90% and a systolic blood pressure <100mm Hg after induction qualified as postinduction hypoxemia and hypotension (Supplemental Digital Content, Supplemental Table 1, http://links.lww. com/AA/E699). Due to this potential bias, we chose first-attempt success as the primary outcome rather than first-attempt success without adverse effects.

Secondary outcomes included first-attempt success without adverse events (adverse events included peri-intubation vomiting, esophageal intubation, bradydysrhythmia, cardiac arrest, oxygen saturation <90% or drop of 10%, systolic blood pressure <100 mm Hg, and tachydysrhythmia), poor glottic view (ie, Cormack-Lehane grads 3 or 4), peri-intubation cardiac arrest (not limited to during the first attempt), a rescue surgical airway attempt (not limited to during the first attempt), the total number of airway attempts, and first-attempt peri-intubation adverse events (listed above) at the first attempt.

Table 1. Difficult Airway Definitions	
Anatomically difficult airway	Physiologically difficult airway
At least one of the following:	At least one of the following:
 Indication of airway obstruction or angioedema 	 Preinduction hypoxemia <90% oxygen saturation
Reduced neck mobility	 Preinduction hypotension <100 mm Hg systolic blood pressure
• Mallampati >2	 Peri-intubation vasopressor medication administration at the first attempt
 Mouth opening <3 fingers 	 Shock indication for intubation
 Thyromental distance <3 fingers 	Obese or morbidly obese
Facial or neck trauma	
Blood in the airway	
Obese or morbidly obese	

June 2024 • Volume 138 • Number 6 www.anesthesia-analgesia.org 1251 Copyright © 2024 International Anesthesia Research Society. Unauthorized reproduction of this article is prohibited. defined as occurring during or immediately after a tracheal intubation attempt. The supplement presents additional details on the coding of outcomes (Supplemental Digital Content, Supplemental Table 1, http://links.lww.com/AA/E699).

Statistical Analysis

We reported our findings in accordance with the Strengthening the Reporting of Observational Studies in Epidemiology recommendations.²⁷ We measured variables and unadjusted outcomes between difficult airway types with descriptive statistics. Adjusted estimates for primary and select secondary outcomes were estimated using multiple variable mixedeffects regression models (logistic and Poisson). We use mixed-effects models to account for clustering at the site level by modeling site as a random effect. Fixed effects included the presence of a difficult airway type (independent variable) and covariates including laryngoscopy device type, intubator postgraduate year, trauma indication, and patient age. Sensitivity analyses examined first-attempt success with the same model but with the following alterations: after multiple imputation of the study dataset (Supplemental Digital Content, Supplemental Table 2, http://links.lww.com/AA/E699), after excluding laryngoscopy device type from the model and selecting only direct or video laryngoscopy cases, and after including interaction terms between difficult airway type and laryngoscopy device type. Nonparametric bootstrapping methods were used to calculate adjusted estimates and confidence intervals (CIs), since they do not assume normality of the data.28,29 Additional modeling details are presented in the supplement.

Lastly, we performed an interaction analysis to examine the potential interaction between ADAs and PDAs with first-attempt success and first-attempt success without adverse events. We tested for the interaction on both multiplicative and additive scales using regression-based methods including the likelihood ratio test. Additional details on the interaction models and analyses are presented in the supplement. We performed the analysis using R (Version 4.2.1 2022-06-23, R Foundation for Statistical Computing, Vienna, Austria) with packages reported in the supplement (Supplemental Digital Content, Supplemental Figure 1, http://links.lww.com/AA/E699).

Sample Size

No prior work has examined the difference in firstattempt success between ADAs, PDAs, and combined ADAs and PDAs compared to those with neither ADAs nor PDAs. However, since obesity is common in NEAR, associated with reduced first-attempt success, and a component of our ADA and PDA definitions (Table 1),^{30,31} we used first-attempt success between lean and overweight patients to perform a sample size calculation.³¹ In a study of 6889 patients from the Japanese Emergency Airway Network, first-attempt success was 70.9% in lean patients vs 66.4% in overweight patients.³¹ Although small, we felt this difference in first-attempt success would be clinically significant given the association between multiple attempts and poor intubation outcomes.^{24–26} Therefore, to achieve 80% power at a significance level of 0.05, this study would need 1667 patients per group to detect a similar difference.

RESULTS

Participants

Of the 19,071 subjects intubated during the study period, 13,938 were included in the study cohort after exclusions (Figure 1).

Descriptive Data

Subjects were classified by difficult airway type, and 1867 had neither ADAs nor PDAs, 3664 had ADAs alone, 1304 had PDAs alone, and 7103 had findings of both ADAs and PDAs (Figure 1). The median patient age in years and interquartile ranges for each difficult airway group were 50.00 [32.00–64.00], 48.00 [30.00–63.00], 56.90 [40.00–70.00], and 55.00 [39.00–67.00], respectively (Table 2). Most subjects were intubated by resident physicians in their third postgraduate training year (Table 3).

Mediation Analysis

The effect of obesity/ morbid obesity on first-attempt success was partially mediated via postinduction hypoxemia with an indirect effect of adjusted odds ratio (aOR) 0.992 (95% CI, 0.985-0.998) and a remaining direct effect of aOR 0.986 (95% CI, 0.981-0.999) (Supplemental Digital Content, Supplemental Figure 2, http://links.lww.com/AA/E699). The effect of obesity/ morbid obesity on first-attempt success was partially mediated via poor glottic view with an indirect effect of aOR 0.990 (95% CI, 0.983-0.996) and a remaining direct effect of aOR 0.984 (95% CI, 0.980-0.998) (Supplemental Digital Content, Supplemental Figure 3, http://links.lww.com/AA/E699). Model outputs used for the mediation analysis are presented in the supplement (Supplemental Digital Content, Supplemental Table 3, http://links.lww.com/AA/ E699). Therefore, obesity/ morbid obesity was included as a characteristic for both ADAs and PDAs.

Unadjusted Outcome Data

First-attempt success occurred in 1750 of 1867 (93.7%) with neither ADAs nor PDAs, 3268 of 3664 (89.2%) with ADAs, 1212 of 1304 (92.9%) with PDAs, and 6209 of 7103 (87.4%) with both ADAs and PDAs.

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Figure 1. Study flow diagram displaying included and excluded subjects. ADA indicates anatomically difficult airways; DL, direct laryngoscopy; PDA, physiologically difficult airways; RSI, rapid sequence intubation; VL, video laryngoscopy.

Peri-intubation cardiac arrest on any attempt occurred in 7 of 1867 (0.4%) with neither ADAs nor PDAs, 13 of 3664 (0.4%) with ADAs, 19 of 1304 (1.5%) with PDAs, and 107 of 7103 (1.5%) with both ADAs and PDAs (Table 4).

Adjusted And Sensitivity Analyses

Compared to those without difficult airway findings (neither ADAs nor PDAs), the aORs for firstattempt success were 0.53 (95% CI, 0.40-0.68) for ADAs, 0.96 (0.68–1.36) for PDAs, and 0.44 (0.34–0.56) for both (Figure 2, Supplemental Digital Content, Supplemental Table 4, http://links.lww.com/ AA/E699), where an aOR of less than 1 indicates a decreased odds of first-attempt success. Comparable results were obtained for first-attempt success despite adding interaction terms between the difficult airway type and laryngoscopy device (ie, DL or VL). These results remained similar and robust after multiple imputation of missing values and performing the analysis in parallel with only DL and VL cases (Supplemental Digital Content, Supplemental Figure 4, Supplemental Table 4, http://links.lww. com/AA/E699).

With the neither ADA nor PDA group as the reference, the aORs for first-attempt success without adverse events were 0.72 (95% CI, 0.59–0.89) for ADAs alone, 0.79 (0.62–1.01) for PDAs alone, and 0.44 (0.37–0.54) for both (Figure 2, Supplemental Digital Content, Supplemental Table 4, http://links. lww.com/AA/E699). The adjusted estimates for total attempts compared to the reference group were 0.06 (95% CI, 0.04–0.08) for ADAs alone, 0.01 (–0.02 to 0.03) for PDAs alone, and 0.08 (0.06–0.10) for both (Figure 2, Supplemental Table 4, http://links.lww.com/AA/ E699). Lastly, compared to the neither ADA nor PDA group, aORs for peri-intubation cardiac arrest on any attempt were 1.35 (95% CI, 0.30–23.70) for ADAs alone, 7.71 (2.39–130.94) for PDAs alone, and 8.75 (3.66–152.72) for both (Figure 2, Supplemental Table 4, http://links.lww.com/AA/E699).

Interaction Analysis

In the full interaction model (with ADA-by-PDA interaction term) for first-attempt success, the aORs were 0.58 (95% CI, 0.46-0.72) for ADA versus no ADA, 1.00 (0.76–1.38) for PDA versus no PDA, and 0.84 (0.60-1.14) for the ADA and PDA interaction, indicating no multiplicative interaction, likelihood ratio test P = .275 (Supplemental Digital Content, Supplemental Tables 5 and 6, http://links.lww. com/AA/E699). In the full interaction model for first-attempt success without adverse events, the aORs were 0.78 (0.66-0.92) for ADA versus no ADA, 0.84 (0.68-1.02) for PDA versus no PDA, and 0.72 (0.58–0.91) for the ADA and PDA interaction, indicating a less than multiplicative interaction, likelihood ratio test P = .005 (Supplemental Digital Content, Supplemental Tables 5 and 6, http://links. lww.com/AA/E699). In summary, there was no evidence that the interaction for either analysis (ie, with or without adverse events) was different from additive, since the confidence intervals for 2 measures of additivity both included zero (Supplemental Digital Content, Supplemental Table 6, http://links.lww. com/AA/E699).

DISCUSSION

We found ADAs were adversely associated with firstattempt success and total number of airway attempts, while PDAs were not (Figure 2, Supplemental Digital Content, Supplemental Table 4, http://links.lww. com/AA/E699). In contrast, PDAs were associated with peri-intubation cardiac arrest, while ADAs

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Table 2. Patient Characteristics and Intubator Assessments

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Monipul price0.00.00.00.00.00.07.4.4.0.1Fernale pulcter, n.(s)13.0.7.1152.7.8.7474.6.6.350.1.1Fernale pulcter, n.(s)0.0.00.0.0.02.0.0.12.0.0.1Tunnaie indication for instantion, n.(b)13.27.1.12.520.(3.5.2.11.6.6.9.02.52.8.1Titue indication for instantion, n.(b)13.27.1.12.50.(3.5.2.11.6.6.9.06.5.0.1Nakang0.0.0.14.0.0.10.0.0.06.5.0.110.0.1Nakang0.0.0.14.0.0.10.0.0.06.5.0.1Nakang0.0.0.110.0.10.0.0.16.5.0.1Nakang0.0.0.115.0.0.10.0.0.12.50.1Nakang0.0.0.115.0.0.110.0.0.112.0.2.1Nakang0.0.0.115.0.0.110.0.0.112.0.2.1Nakang0.0.0.115.0.0.110.0.0.112.0.2.1Nakang0.0.0.115.0.0.110.0.0.112.0.2.1Nakang0.0.0.115.0.0.110.0.0.112.0.2.1Nakang0.0.0.115.0.0.110.0.0.112.0.2.1Nakang0.0.0.115.0.0.110.0.0.112.0.2.1Nakang0.0.0.115.0.0.110.0.0.112.0.2.1Nakang0.0.0.115.0.0.110.0.110.0.112.0.2.1Nakang0.0.0.115.0.0.110.0.110.0.112.0.2.1Nakang0.0.0.115.0.0.110.0.110.0.112.0.2.1Nakang0.0.0.110.0.110.0.1 <td>Obese</td> <td>0 (0.0)</td> <td>0 (0.0)</td> <td>0 (0.0)</td> <td>3706 (52.2)</td>	Obese	0 (0.0)	0 (0.0)	0 (0.0)	3706 (52.2)
Mean Penale adtent, b8(0,7)10(0,7)9(0,6)9(0,6)283,03,04Mean Mean Mean 	Morbidly obese (BMI >40)	0 (0.0)	0 (0.0)	0 (0.0)	714 (10.1)
Family constraint of a set of a	Missing	13 (0.7)	14 (0.4)	8 (0.6)	5 (0.1)
bes058 (36.2)1052 (28.7)474 (36.3)2583 (36.4)Meaning (0)01.0.001.0.0216 (8.9)1358 (25.8)Taura indication for intuition, n(%)32.2 (7.1)239 (35.2)136 (8.9)1358 (25.8)Pice taura, n (%)32.3 (0.0.0)36.2 (0.0.0)36.2 (0.0.0)66 (3.8)Shoci indication for intuition, n(%)0.0.00.0.0235 (12.8)65 (22.8)Bioch indication finithation, n(%)0.0.0136 (3.6)0.0.023 (12.8)Bioch indication finithation, n(%)146 (3.6)0.0.020.7 (28.3)Masing0.0.0156 (6.6)0.0.020.7 (28.3)Masing (0.0.0)165 (6.6)0.0.020.7 (28.3)Masing (0.0.0)165 (6.6)0.0.020.7 (28.3)Masing (0.0.0)165 (6.6)0.0.020.7 (28.3)Masing (0.0.0)160 (13.0)0.0.020.1 (27.1)Angelenkin, n(%)160 (13.0)160 (13.0)70.0Casa 1160 (10.0)26 (28.4)160 (12.3)Casa 30.0.026 (28.4)0.0.0420 (62.2)Not assessed136 (16.3)100.3)70.010.4Mating (0)160 (14.0)17.1 (13.1)87.1 (28.1)Masing (0)160 (14.3)160 (13.0)420 (12.7)Casa 40.0.026 (28.1)160 (28.1)Mating (0)160 (14.0)70.023.0 (13.0)Mating (0)160 (14.0)17.1 (13.1)87.1 (28.1)Masing (0)160 (13.0)160 (13.0)160 (12	Female patient, n (%)				
Misnig!0.0.0.0.0.0.0.0.0.0.0.0.2.0.0.1Theore inclusion (not books)1.32 (7.3)1.32 (3.2)1.16 (8.0)8.5 (2.5)Face trauma, n(%)0.0.0.6.65 (3.8)0.0.0.6.6.1.3)Stock indication for instabuton, n(%)0.0.0.0.0.0.2.5 (1.5)6.56 (3.8)Stock indication for instabuton, n(%)0.0.0.1.67 (3.5)9.0.0.2.60 (3.5)Stock indication for instabuton, n(%)0.0.0.1.66 (3.6)0.0.0.2.00 (2.3)Making5.1 (2.7)1.2 (0.3)9.0.0.2.00 (2.3)Alway distriction, n(%)1.56 (6.6)0.0.0.2.0 (2.3)Missing0.1 (2.1)3.0 (1.3)3.0 (3.1)1.2 (0.2)Alway distriction, n(%)1.56 (5.6)0.0.0.2.0 (2.1)Missing0.0.0.2.0 (0.6)2.0 (0.1)2.0 (2.1)Missing0.0.0.3.0 (3.1)1.2 (0.2)1.5 (1.2)Alway distriction, n(%)1.5 (2.5)0.6 (3.4)0.0.02.0 (2.1)Missing0.0.0.3.6 (3.4)0.0.04.0 (2.2)Casa 30.0.0.3.0 (2.6)0.0.03.0 (2.1)Casa 40.0.0.1.5 (2.4,1)0.6 (3.4)2.5 (3.5)Missing3.4 (1.8)1.5 (2.4,2)0.0.0.3.0 (3.1)Mouto company, n %)1.5 (3.5,1)1.5 (2.4,4)4.0 (3.0,1)3.0 (3.1)Mouto company, n %)1.5 (3.5,1)1.5 (2.4,4)4.0 (3.0,1)3.0 (3.1)Mouto company, n %)1.5 (3.5,1)1.5 (2.4,4)	Yes	658 (35.2)	1052 (28.7)	474 (36.3)	2583 (36.4)
Tiauma Indication for Hubation, n(%)129 (.21)129 (.82, .2)116 (.8.9)1888 (.8.9)Nee trauma, n(%)0.00,505 (.4.3, .3.1)0.00,774 (.4.2., .2.1)Nestama, n(%)0.00,66 (.3.6)0.00,66 (.3.6)Stock indication for initiation, n(%)0.00,66 (.3.6)0.00,2007 (.8.5, .3.1)Nestama, n(%)0.00,1167 (.31.9)0.00,2007 (.8.5, .3.1)Nestama, n(%)0.00,156 (.6.6)0.00,207 (.8.5, .3.1)Nestama, n(%)0.00,50 (.6.6)0.00,20 (.0.2)Nestama, n(%)0.00,50 (.6.6)0.00,20 (.2.0, .3.1)Nestama, n(%)0.00,50 (.6.6)0.00,20 (.2.0, .3.1)Nestama, n(%)0.00,20 (.0.1)121 (.2.1)57 (.8.0)Nestama, n(%)0.00,20 (.0.1)121 (.2.1)57 (.8.0)Nestama, n(%)0.00,20 (.0.1)121 (.2.1)107 (.1.2, .1.1)Nestama, n(%)0.00,20 (.0.1)121 (.2.1)101 (.2.1)Nestama, n(%)0.00,20 (.2.1)101 (.2.1)121 (.2.1)Nestama, n(%)0.00,30 (.2.1)121 (.2.1)121 (.2.1)Nestama, n(%)0.00,30 (.2.1)121 (.2.1)121 (.2.1)Nestama, n(%)0.00,30 (.2.1)120 (.2.1)121 (.2.1)Nestama, n(%)0.00,30 (.2.1)120 (.2.1)120 (.2.1)Nestama, n(%)0.00,30 (.2.1)120 (.2.1)120 (.2.1)Nestama, n(%)100,100, </td <td>Missing</td> <td>0 (0.0)</td> <td>0 (0.0)</td> <td>0 (0.0)</td> <td>2 (0.0)</td>	Missing	0 (0.0)	0 (0.0)	0 (0.0)	2 (0.0)
Series0.0.0.1656 (3.8.8.)0.0.0.0774 (42.2.)Messing0.2.3.0.2.3.0.0.0.10.0.0.0<	Trauma indication for intubation, n (%)	132 (7.1)	1290 (35.2)	116 (8.9)	1836 (25.8)
Wes0 (0.0)558 (4.8)0 (0.0)774 (4.2.2)Messing3 (2.3)3 (2.6)1 (0.1)Neck trauma, n(%)0 (0.0)46 (3.6)0 (0.0)66 (3.5)Stock indication for intubation, n(%)0 (0.0)235 (1.9.8)66 (1.2.5)Bindy mays, n (%)1 167 (31.9)0 (0.0)2007 (28.3)Messing0 (0.0)1 56 (6.6)0 (0.0)207 (28.3)Massing20 (1.2.1)1 56 (6.6)0 (0.0)207 (28.3)Angoedeena, n (%)0 (0.0)156 (6.6)0 (0.0)20 (2.0.2)Angoedeena, n (%)0 (0.0)20 (2.1.2)160 (1.2.3)57 (1.6.0)Class 120 (1.2.1)400 (3.4.1)171 (13.1)571 (8.0.0)Class 30 (0.0)362 (49.0)0 (0.0)902 (12.7)Class 40 (0.0)362 (49.0)0 (0.0)902 (12.7)Class 30 (0.0)362 (49.0)0 (0.0)902 (12.7)Class 40 (0.0)362 (49.0)0 (0.0)902 (12.7)Messing34 (1.8.1)150 (58.8)966 (74.1)426 (0.4)Messing30 (1.6.3)10 (0.3)7 (0.5)20 (0.4)Morent-Serie Inform163 (3.1)160 (38.0)0 (0.0)130 (12.9)Morent-Serie Inform163 (3.1)160 (38.0)10.0130 (4.1)Messing0 (0.0)164 (4.4.3)0 (0.0)130 (4.1)Morent-Serie Inform116 (1.8.1)10 (1.8.1)130 (1.4.1)Morent-Serie Inform10 (0.1)164 (4.1.3)	Face trauma, n (%)				
Missing3 [2,3)3 [0,2)3 [2,6)1 (0,1)Bock fausan, r(5)0 (0,0)0 (0,0)235 (19,8)66 (13,5)Shock indication for imbalance, r(6)157 (21,2)210,3)9 (0,0)2007 (28,3)Missing51 (2,7)1 (2,0,3)0 (0,0)207 (28,3)Alrwy dostruction, r(6)156 (6,6)0 (0,0)307 (5,8)Missing0 (2,0,0)2 (0,3)3 (0,3,3)12 (0,2)Alrwy dostruction, r(6)0 (0,0)2 (0,1)3 (0,3,3)12 (0,2)Maliong (1, 6)'0 (0,0)2 (0,4)171 (13,1)571 (8,0)Class 10 (0,0)20 (0,8)0 (0,0)42 (12,3)Class 30 (0,0)26 (2,4)0 (0,0)42 (2,7)Class 40 (0,0)126 (3,4)0 (0,0)420 (12,7)Class 40 (0,0)12 (2,4)10 (3,2)10 (3,2)Mosting (1, 6)'138 (13,4)152 (43,4)450 (34,4)250 (15,6)Mosting (1, 6)'138 (13,4)152 (43,4)440 (2,1)145 (13,9)Not assessed138 (13,4)152 (43,4)440 (3,4)250 (15,6)Not assessed138 (13,4)152 (43,4)440 (14,6)130 (14,6)Mosting (1, 6)'140 (13,2)160 (13,1)160 (14,6)130 (14,6)Not assessed138 (13,6),4140 (13,2)160 (14,6)130 (14,6)Not assessed143 (12,9)10 (14,6)10 (14,6)10 (14,6)Mosting (14, 6)160 (14,6)10 (14,6)10 (14,6)10 (14,6) <trr><</trr>	Yes	0 (0.0)	565 (43.8)	0 (0.0)	774 (42.2)
Neck transm, n(%)0 (0,0)40 (3.6)0 (0,0)66 (1.25)Block indication for intubation, n(%)0 (0,0)1.67 (31.9)0 (0,0)2.007 (28.3)Missing15 (2.7)1.167 (31.9)0 (0,0)2.007 (28.3)Missing0 (0,0)1.56 (6.6)0 (0,0)3.02 (3.1)Missing0 (0,0)1.00 (3.0)1.2 (0.2)Angioadema, n(%)0 (0,0)2.00 (3.1)1.03 (3.1)1.2 (0.2)Angioadema, n(%)0 (0,0)3.02 (3.1)1.01 (3.1)5.71 (8.6)Class 11.96 (1.5)5.01 (4.2)1.01 (1.3)5.71 (8.6)Class 30 (0,0)3.22 (9.9)0 (0,0)9.22 (1.7)Class 40 (0,0)3.22 (9.9)0 (0,0)4.40 (6.2)Net assessed1.390 (74.5)2.56 (8.8)9.66 (74.1)4.27 (10.4)Net assessed1.331 (8.4)1.00 (3.1)1.00 (3.1)1.00 (3.1)Norma)4 finger length0 (0,0)6.02 (8.0)0.003.10 (9.4)Net assessed1.331 (8.4)1.400 (8.2)9.02 (3.1)3.10 (9.4)Net assessed1.133 (18.4)1.400 (8.1)0.10 (1.1)1.20 (3.1)Net assessed1.133 (18.4)1.100 (1.1)1.10 (1.1)1.100 (1.1)Net assessed1.133 (18.4)1	Missing	3 (2.3)	3 (0.2)	3 (2.6)	1 (0.1)
<tbody< tr="">Shock mediation for mutuation, n.m.0 (0,0)0 (0,0)25 (12.9)00.0)20 (12.5)Yes0 (0,0)1167 (31.9)0 (0,0)24 (0.3)Missing5 (2.7)12 (0.3)9 (0.7)24 (0.3)Arrwy destruction, n (%)7777Yes0 (0,0)25 (0.5)0 (0,0)22 (0.4)10.0)22 (0.2)Arrwy destruction, n (%)0 (0,0)20 (0.3)17 (1.3.1)17 (1.6.0)10.0)22 (0.4)Close 129 (1.2.3)57 (1.6.3)57 (1.6.3)57 (1.6.3)57 (1.6.3)10.0)22 (0.4)Adjectedman, n (%)0 (0,0)26 (3.4.4)0 (0.0)40 (6.2)40 (0.4)4287 (00.4)Close 30 (0,0)26 (3.4.1)10 (0.3)7 (0.5)31 (0.4)Mort assessed1380 (7.4.5)159 (24.4.1)449 (24.4.1)2380 (25.6)Mort assessed1383 (63.4)1400 (38.2)0 (0.0)1416 (19.9)Mort assessed1183 (63.4)1400 (38.2)0 (0.0)139 (32.9)Mort assessed1183 (63.4)1400 (38.2)0 (0.0)139 (1.6.3)<th< td=""><td>Neck trauma, n (%)</td><td>0 (0.0)</td><td>46 (3.6)</td><td>0 (0.0)</td><td>66 (3.6)</td></th<></tbody<>	Neck trauma, n (%)	0 (0.0)	46 (3.6)	0 (0.0)	66 (3.6)
pictorypictorypictorypictorypictorypictoryMissing51,27,712,03,79(0,7)2,007,28,3Missing01,0,0156,66,10,0,032,0,31Missing01,0,020,0,800,0,022,0,4Missing01,0,020,0,800,0,022,0,4Missing01,0,020,0,800,0,022,0,4Missing01,0,022,0,111,1,1,1,151,1,60,1Class 1196,0,122,0,410,0,022,0,4Class 30,0,022,0,90,0,022,1,2,1Class 40,0,026,2,9,10,0,024,1,1,80,1Class 50,0,026,2,9,10,0,0440,6,2,1Missing0,0,026,1,4,140,2,4,4,142,2,1,4,1,4,1,4,1,4,1,4,1,4,4,1,4,4,4,4	Shock indication for intubation, n (%)	0 (0.0)	0 (0.0)	235 (19.8)	656 (12.5)
nes0,00,0100 (2.5.)0,00,024 (0.3)Missing51,27.12 (0.3)90.07.124 (0.3)Arrow distruction, n (8)00,00,0307 (5.5)Missing20 (0.2)30.01.3 (0.3)12 (0.2)Anguedema, n(%)0 (0.0)20 (0.8)0 (0.0)22 (0.4)Maliengut, n(%)020 (0.8)101 (1.3.1)571 (8.0)Class 1247 (1.3.2)590 (1.2.3.)872 (1.2.3)Class 20 (0.0)26 (3.4)0 (0.0)400 (6.2)Class 40 (0.0)256 (5.8.1)560 (7.4.1)4287 (60.4)Missing0 (0.0)256 (5.8.1)560 (7.4.1)430 (3.0.5.6)Neutrio pening, n(%)255 (58.5.1)560 (7.4.1)230 (0.5.0)210 (4.1.1)Neutrio pening, n(%)20 (0.3)210 (0.0)1416 (19.9)Neutrio pening, n(%)20 (0.3)210 (0.0)1416 (19.9)Neutrio pening, n(%)20 (0.3)20 (0.0)1416 (19.9)Neutrio pening, n(%)20 (0.3)20 (0.0)1416 (19.9)Neutrio pening, n(%)20 (0.3)20 (0.0)1416 (19.9)Neutrio pening of difficut, n(%)23 (1.5.1)20 (0.5)23 (0.4)Neutrio pening of difficut, n(%)23 (1.5.1)20 (0.5)23 (1.4.1)Neing0 (0.0)139 (3.5.1)10 (0.6)137 (4.6.5)Nissing0 (0.0)139 (1.5.1)10 (1.5.1)10 (1.5.1)Nissing0 (0.0)139 (1.5.1)10 (1.5.1)10 (1.5.1)Nissing	Bloody airway, n (%)	0 (0 0)	1167 (21.0)	0 (0 0)	2007 (28.2)
missing 0.1 (2.1) 10 (0.0) 9 (0.7) 24 (0.3) Newsy Obstruction, n (8) 156 (6.6) 0 (0.0) 20 (0.8) 0 (0.0) 22 (0.4) Angiocedems, n (%) 0 (0.0) 20 (0.8) 0 (0.0) 22 (0.4) Angiocedems, n (%) 0 (0.0) 20 (0.8) 0 (0.0) 872 (1.2.3) Class 1 247 (1.3.2) 50 (1.4.2) 156 (12.3.3) 872 (12.3) Class 3 0 (0.0) 226 (3.4) 160 (12.3.3) 872 (12.3) Class 4 0 (0.0) 126 (5.6.8) 966 (7.4.1.3) 4267 (60.4) Messing 34 (1.8) 10 (0.3) 7 (0.5) 31 (0.4) Messing 34 (1.8) 10 (0.3) 7 (0.5) 329 (44.1) Messing 138 (5.4.1) 140 (3.8.2) 848 (65.0.0) 3129 (44.1) Not assessed 1183 (63.4.1) 140 (0.3.2) 848 (65.0.0) 3129 (44.1) Missing 43 (2.3.3) 9 (0.7) 40 (0.5) 12 (0.3) Not assessed 10 (8.1.3) 144 (4.4.9) 10 (0.8) 371 (4.4.6	tes Missing	0 (0.0)	12 (0 2)	0 (0.0)	2007 (28.3)
Number156 (6.6)0 (0.0)907 (5.8)Missing20 (1.2)3 (0.1)3 (0.3)12 (0.2)Mallemeter, N(%)0 (0.0)22 (0.4)21 (0.2)Mallemeter, N(%)100 (0.0)22 (0.4)21 (0.5)Class 1247 (13.2)490 (13.4)171 (13.1)571 (8.0)Class 2156 (10.5)520 (14.2)160 (12.3)872 (12.3)Class 30 (0.0)362 (9.0)0 (0.0)962 (12.7)Class 40 (0.0)26 (14.2)165 (12.3)430 (6.2)Nota sensed1390 (74.5)2156 (58.3)9 (66 (74.1)437 (60.4)Missing34 (1.8)10 (0.3)7 (0.5)31 (0.4)Nota sensed1389 (63.4)100 (3.2)484 (65.0)122 (41.1)Nota sensed138 (63.4)1400 (38.2)484 (65.0)122 (41.1)Missing24 (1.5)120 (3.2)484 (65.0)122 (41.1)Missing10 (0.3)23 (32.9)10.0)1416 (19.9)Nota sensed138 (63.4)1400 (38.2)484 (65.0)129 (41.1)Missing10 (0.3)23 (32.9)10.0)121 (44.6)Missing10 (0.1)120 (2.0)141 (4.9)10.0)121 (44.6)Missing10 (0.2)131 (36.0)10 (0.8)137 (1.9)131 (36.0)10 (3.1)Missing10 (0.0)131 (136.0)10 (0.1)130 (1.7)130 (1.7)130 (1.7)Pingers26 (15.3)47 (10.1)10 (0.8)137 (1.9)136 (1.7)10 (0.0)	Airway obstruction n (%)	51 (2.7)	12 (0.3)	9(0.7)	24 (0.3)
Initiang Oxtoo Solution Solution Solution Missing 20 (1.2) 3 (0.1) 3 (0.3) 12 (0.2) Angionedma, n (%) 0 (0.0) 20 (0.6) 0 (0.0) 22 (0.4) Class 1 247 (13.2) 490 (13.4) 171 (13.1) 671 (6.0) Class 3 0 (0.0) 328 (9.9) 0 (0.0) 420 (12.3) Class 4 0 (0.0) 126 (5.8) 96 (7.1.0) 420 (6.2) Not assessed 1330 (7.1.5) 1552 (45.4) 96 (7.1.0) 420 (3.6) Nott assessed 1330 (7.1.5) 152 (4.4) 449 (34.4) 253 (35.6) Nott assessed 1183 (63.4) 1400 (38.2) 948 (65.0) 1219 (4.1) Nott assessed 1183 (63.4) 1400 (38.2) 948 (65.0) 1219 (4.1) Nissing 24 (2.5) 12 (0.3) 129 (4.1) 120 (3.6) Nissing 43 (2.3) 9 (0.7) 40 (0.6) 127 (1.9) Nissing 108 (5.8) 76 (26.6) 14 (4.0) 10 (3.17 (1.9) Nissing	Vec	0 (0 0)	156 (6.6)	0 (0 0)	307 (5.8)
Angeodem And And And And Mailemedia, n (%) 0 (0.0) 20 (0.8) 0 (0.0) 22 (0.4) Mailemedia, n (%) 490 (13.4) 171 (13.1) 571 (8.0) Class 1 196 (0.0) 32 (0.9) 0 (0.0) 902 (12.7) Class 4 0 (0.0) 126 (3.9) 0 (0.0) 440 (6.2) Not assessed 139 (74.5) 1256 (58.9) 966 (74.1) 427 (16.0) Maining 34 (1.8) 10 (0.3) 7 (0.5) 31 (0.4) Noth assessed 158 (3.4) 1400 (38.2) 448 (65.0) 1446 (19.9) Not assessed 158 (5.1) 1592 (43.4) 449 (34.4) 2530 (35.6) Not assessed 158 (5.4) 1400 (38.2) 448 (65.0) 1446 (19.9) Not assessed 158 (5.4) 1400 (38.2) 448 (65.0) 129 (44.1) Missing 0 (0.0) 166 (5.1) 160 (5.1) 239 (5.2) 140 (5.2) Not assessed 0 (0.0) 136 (2.3) 44 (6.0) 100 (3.2) 128 (6.3)	Missing	20 (1 2)	3 (0 1)	3 (0.3)	12 (0 2)
Mediampati, no. Local Local Local Class 1 247 (13.2) 490 (13.4) 171 (13.1) 571 (8.0) Class 3 0 (0.0) 362 (9.9) 0 (0.0) 402 (12.7) Class 3 0 (0.0) 126 (5.3,4) 0 (0.0) 402 (12.7) Not assessed 1390 (74.5) 1216 (58.8) 96 (74.1) 4287 (60.4) Musing 34 (1.8) 10 (0.3) 7 (0.5) 31 (0.4) Musing 34 (1.8) 10 (0.3) 449 (34.4) 2530 (35.6) Reduced—1-2 Inger lengths 656 (35.1) 1592 (43.4) 449 (34.4) 2530 (35.6) Not assessed 1183 (63.4) 1400 (38.2) 848 (65.0) 3129 (44.1) Missing 216 (1.5) 12 (0.3) 7 (0.5) 28 (0.4) Reduced neck mobility, n (%) ''' ''' 3236 (32.9) Missing 43 (2.3) 9 (0.2) 6 (0.5) 19 (0.3) Indiator impression of difficut, n (%) ''' ''' ''' Yes 0 (0.0) 154 (4.4.9) 0 (Angioedema, n (%)	0 (0.0)	20 (0.8)	0 (0.0)	22 (0.4)
Class 1 247 (13.2) 490 (13.4) 171 (13.1) 571 (8.0) Class 2 196 (10.5) 520 (14.2) 160 (12.3) 872 (12.3) Class 3 0 (0.0) 126 (3.9) 0 (0.0) 440 (6.2) Class 4 0 (0.0) 126 (3.9) 0 (0.0) 440 (6.2) Masing 34 (1.8) 10 (0.3) 7 (0.5) 31 (0.4) Mouth opening, n (%)	Mallampati. n (%)	- ()		- ()	(***)
Class 2196 (10.5)520 (14.2)160 (12.3)872 (12.3)Class 30 (0.0)362 (9.9)0 (0.0)902 (12.7)Class 40 (0.0)126 (3.4)0 (0.0)4287 (60.4)Not assessed1390 (74.5)2166 (58.8)96 (74.1)4287 (60.4)Masing0 (1.6)150 (1.6)76 (1.6)310.(A)Not modening, n (%)550 (15.1)1502 (15.4)439 (14.4)310.(A)Not assessed0 (0.0)660 (18.0)0.001416 (19.9)Not assessed1183 (63.4)1400 (38.2)484 (65.0)3129 (44.1)Missing28 (1.5)16.44 (44.9)0 (0.0)233 (52.9)Reduced neck mobility, n (%)10.0233 (52.9)3136 (3.9)Not assessed16.090.010.4 (8.0)317 (14.6)Industry90.016.44 (4.9)0 (0.0)233 (52.9)Industry91.090.010.0 (8.1)317 (19.1)Industry91.091.090.0233 (52.9)Nasing0.0.0134 (12.2)104 (18.0)137 (19.1)3 fingers0.0.0134 (12.2)104 (18.0)137 (19.1)3 fingers0.0.0134 (13.9)0.0.01380 (25.1)Not assessed135 (82.2)110.310.0 (1.6)136 (1.6)Not assessed130 (28.1)110 (10.0)136 (1.6)10.10 (1.6)Not assessed10.010.010.010.0 (1.6)10.0 (1.6)Not assessed10.010.010.0 (1.6)	Class 1	247 (13.2)	490 (13.4)	171 (13.1)	571 (8.0)
Class 30 (0,0)362 (9,9)0 (0,0)902 (1,7)Class 40 (0,0)126 (3.4)0 (0,0)440 (6.2)Mota sessed30 (1,8)10 (0.3)7 (0.5)31 (0.4)Motth opening, n (%)552 (43.4)49 (34.4)253 (35.6)Reduced3-2 finger lengths65 (35.1)1592 (43.4)49 (34.4)253 (35.6)Nota sessed1183 (63.4)1400 (38.2)84 (65.0)312 (94.1)Missing20 (1,5)12 (0,3)70.6)236 (32.9)Missing0 (0,0)644 (44.9)0 (0.0)236 (32.9)Reduced net mobility, n (%)1290.2)90.0236 (32.9)Intustor12.390.2)90.01236 (2.9)Missing164.2, (3.9)90.0290.01236 (2.9)Intustor12.390.6590.7)90.01314 (4.6)Missing164.2, (3.9)90.0290.7)40.0890.01Integra10 (0,0)1319 (36.0)90.01137 (1.9)137 (1.9)Integra0 (0,0)1319 (36.0)104 (1.9)130 (2.5)100.0)Integra10 (0,0)1319 (36.0)90 (1.0)310 (35.6)Not assessed153 (82.2)153 (18.2)161 (2.7)101 (0.0)Integra(0.0)144 (3.9)00.01130 (35.6)Not assessed153 (82.2)150 (4.6)90 (1.0)30 (5.5)Not assessed153 (82.2)154 (4.2)154 (4.1)150 (5.6)Not assessed153 (82.2)<	Class 2	196 (10.5)	520 (14.2)	160 (12.3)	872 (12.3)
Class 40 (0.0)126 (3.4)0 (0.0)44 (0.6.2)Not assessed330 (74.5)2156 (58.8)966 (74.1)4287 (60.4)Massing34 (1.8)10 (0.3)7 (0.5)31 (0.4)Normal3t finger lengths656 (35.1)1592 (43.4)493 (4.4)253 (35.6)Reduced1.2 finger lengths0 (0.0)650 (18.0)0 (0.0)3129 (44.1)Not assessed1183 (63.4)1400 (38.2)848 (65.0)3129 (44.1)Missing216.1512 (0.3)7 (0.5)28 (0.4)Reduced-netk mobility, n (%)12 (0.3)0 (0.0)23 (32.9)Nissing0 (0.0)164 (44.9)0 (0.0)23 (32.9)Missing108 (5.8)976 (26.6)104 (8.0)317 (1.4,6)Missing108 (5.8)976 (26.6)104 (8.0)317 (1.4,6)Missing108 (5.8)37 (1.0)104 (8.0)137 (1.9)2 fingers108 (5.8)448 (1.2.2)194 (1.4.9)120 (5.7)3 fingers0 (0.0)134 (36.0)0 (0.0)1708 (2.0)3 fingers0 (0.0)134 (36.0)0 (0.0)1708 (2.0)4 fingers0 (0.0)134 (3.2)194 (1.4.9)3810 (5.6)Not assessed153 (82.2)153 (82.1)194 (1.4.9)3810 (5.6)Not assessed150 (28.4)600 (18.0)275 (21.1)1397 (1.9)1 fingers0 (0.0)10.010.0130 (3.6)1 fingers0 (0.1)134 (3.1)140 (2.0)3810 (5.3)1 fingers10	Class 3	0 (0.0)	362 (9.9)	0 (0.0)	902 (12.7)
Nataseesed1390 (74.5)2156 (58.9)96 (67.4.1)4327 (60.4)Missing34 (1.8)10 (0.3)7 (0.5)31 (0.4)Mouth opening, n (%) </td <td>Class 4</td> <td>0 (0.0)</td> <td>126 (3.4)</td> <td>0 (0.0)</td> <td>440 (6.2)</td>	Class 4	0 (0.0)	126 (3.4)	0 (0.0)	440 (6.2)
Missing94 (1.8)10 (0.3)7 (0.5)31 (0.4)Normal-3 finger lengths656 (35.1)159 (43.4)449 (34.4)2530 (35.6)Reduced-1-2 finger lengths158 (63.4)1600 (38.2)848 (65.0)312.9 (4.1)Not assessed138 (63.4)100 (03.2)848 (65.0)312.9 (4.1)Missing28 (1.5)164 (44.9)0.0.0236 (3.2.9)Reduced neck mobility, n(%)164 (44.9)0.0.0236 (3.2.9)Nissing0.0.0164 (44.9)0.0.0236 (3.2.9)Inbustor164 (44.9)0.0.0236 (3.2.9)Nissing0.10.0164 (44.9)0.0.0236 (3.2.9)Inbustor10.80.0.0236 (3.2.9)20.0.3Nissing0.10.0164 (44.9)0.0.0236 (3.2.9)Inbustor108 (5.8)976 (26.6)104 (8.0)317 (1.46.1)Nissing108 (5.8)976 (26.6)104 (8.0)377 (1.46.1)Ingers10.65154 (2.2.9)139 (36.0)100.01708 (24.0)A fingers0.0.010.0100.0108 (2.6)100.0Not assessed10.010.010.0108 (2.6)100.0Not assessed153 (2.2.2.1)107 (1.6)109 (1.6)100.0Not assessed130 (28.4)60 (18.0)275 (1.1)1397 (1.9,1)Not assessed130 (28.4)60 (18.0)176 (3.1)130 (3.0,3)Not assessed130 (10.8)134 (3.2.1)140 (1.0)136 (3.0)Not assessed <td< td=""><td>Not assessed</td><td>1390 (74.5)</td><td>2156 (58.8)</td><td>966 (74.1)</td><td>4287 (60.4)</td></td<>	Not assessed	1390 (74.5)	2156 (58.8)	966 (74.1)	4287 (60.4)
Mournal—3+ finger lengths656 (35.1)1552 (43.4)449 (34.4)2530 (35.6)Reduced—1-2 finger lengths0 (0.0)660 (18.0)0 (0.0)1416 (19.9)Nat sasessed1183 (63.4)1400 (38.2)848 (65.0)3129 (44.1)Missing81 (15.0)120 (0.3)7 (0.5)2336 (32.9)Reduced neck mobility. n (%)0 (0.0)0 (0.0)2336 (32.9)Intuisor impression of difficult, n (%)0 (0.0)0 (0.0)3171 (44.6)Missing0 (2.0)0 (0.7)40 (0.6)Thy816 (5.8)70 (26.6)104 (8.0)3171 (14.6)Missing0 (0.0)105 (25.0)100 (8.0)317 (1.9)1 fingers0 (0.5)37 (1.0)100 (8.0)137 (1.9)2 fingers286 (15.3)448 (12.2)104 (14.9)1236 (17.4)3 fingers0 (0.0)1319 (36.0)0 (0.0)137 (1.9)4 + fingers0 (0.0)1319 (36.0)0 (0.0)130 (53.6)Missing0 (0.0)110.399 (0.7)3810 (53.6)10 photections, n (%)110.0025 (21.1)1397 (19.7)Noredose mental status change530 (28.4)660 (18.0)275 (21.1)1397 (19.7)0 editors, n (%)120 (90)166 (12.7)1010.0)0 editors, n (%)166 (22.7)1010.0)380 (5.3)10 hold230 (13.1)140 (22.9)360 (3.1)360 (3.1)0 editors, n (%)155 (11.9)356 (51.5)110 (10.0)10 hold150 (10.1)156 (11.9) <td>Missing</td> <td>34 (1.8)</td> <td>10 (0.3)</td> <td>7 (0.5)</td> <td>31 (0.4)</td>	Missing	34 (1.8)	10 (0.3)	7 (0.5)	31 (0.4)
Nomal-3+ finger lengths656 (35.1)1592 (43.4)449 (34.4)2530 (35.6)Reduced-1-2 finger lengths(0.0)606 (18.0)0.00.01416 (19.9)Not assessed1183 (63.4)12 (0.3)7 (0.5)28 (0.4)Missing0 (0.0)12 (0.3)7 (0.5)28 (0.4)Reduced neck mobility. n (%)12 (0.3)0 (0.0)2356 (32.9)Intubator impression of difficut, n (%)1644 (44.9)0 (0.0)2356 (32.9)Intubator impression of difficut, n (%)10 (0.5)0 (0.7)40 (0.6)Intubator impression of difficut, n (%)10 (0.6)1317 (14.6)1 finger108 (5.8)976 (26.6)104 (8.0)137 (1.9)2 fingers108 (5.8)448 (12.2)194 (14.9)123 (17.4)3 fingers0 (0.0)319 (36.0)0 (0.0)1708 (24.0)4 + fingers0 (0.0)1319 (36.0)0 (0.0)1708 (24.0)Not assessed1535 (82.2)1705 (46.5)1091 (83.7)3810 (53.6)Missing0 (0.0)153 (82.2)1705 (46.5)1091 (83.7)3107 (1.7)10 Indectors, n (%)153 (22.1)103 (20.1)139 (30.1)310 (35.6)Nonverdose mental status change530 (28.4)660 (18.0)75 (21.1)337 (19.7)0 vertose153 (22.2)153 (21.2)156 (21.9)365 (51.5)10 Indectors, n (%)156 (1.9)356 (51.5)151 (1.9)356 (51.5)Piertottor thorowmale, n (%)156 (1.9)356 (1.5)156 (1.9)368 (51.5) <tr< td=""><td>Mouth opening, n (%)</td><td></td><td></td><td></td><td></td></tr<>	Mouth opening, n (%)				
Reduced—1-2 finger lengths 0 (0.0) 660 (8.0) 0 (0.0) 1416 (19.9) Not assesd 1838 (63.4) 1400 (38.2) 7 (0.5) 28 (0.4) Reduced neck mobility. n (%) 7 (0.5) 28 (0.4) 2336 (32.9) Wes 0 (0.0) 6 (0.5) 2336 (32.9) 336 (32.9) Missing 43 (2.3) 9 (0.2) 6 (0.5) 317 (146.6) Intubact impression of difficut, n (%) 7 9 (0.5) 104 (8.0) 317 (1.46.6) Not assess 54 (2.9) 20 (0.5) 9 (0.7) 40 (0.6) Intubact. n (%) 137 (1.9) 137 (1.9) 137 (1.9) Ingers 9 (0.0) 314 (3.6) 0 (0.0) 139 (36.0) 100.0 139 (36.0) Ingers 0 (0.0) 134 (36.0) 0 (0.0) 130 (35.0) 130 (30.0) 130 (30.0) 130 (30.0) 130 (30.0) 130 (30.0) 130 (30.0) 130 (30.0) 130 (30.0) 130 (30.0) 130 (30.0) 130 (30.0) 130 (30.0) 130 (30.0) 130 (30.0) 130 (30.0) 130 (30.0) 130 (30.0)	Normal—3+ finger lengths	656 (35.1)	1592 (43.4)	449 (34.4)	2530 (35.6)
Not sesses of Missing1188 (3.4)1400 (38.2)848 (6.5)3129 (44.1)Missing28 (1.5)12 (0.3)7 (0.5)28 (0.4)Reduced neck mobility. n (%)1644 (44.9)0 (0.0)336 (32.9)Missing0 (0.0)164 (44.9)0 (0.5)19 (0.3)Intubator impression of difficut, n (%)9 (0.2)0 (0.5)171 (44.6)Missing108 (5.8)976 (26.6)104 (8.0)3171 (44.6)Missing0 (0.5)20 (0.5)0 (0.7)40 (0.6)Tyromental distance, n (%)149 (1.4)149 (1.4)126 (1.7.4)1 finger9 (0.5)37 (1.0)10 (0.8)137 (1.9)2 fingers0 (0.0)144 (3.9)0 (0.0)1268 (1.5.3)Not assesed153 (82.2)110 (3.6)139 (18.7)32 (0.5)Not assesed153 (82.2)110 (3.1)9 (0.7)32 (0.5)Norverdose mental status change530 (28.4)660 (18.0)275 (21.1)1397 (19.7)Norverdose mental status change530 (28.4)252 (14.3)166 (12.7)101 (0.0)Seizure20 (1.1)292 (13.7)12 (0.9)380 (5.3)Head injury with hemorrhage16 (0.9)292 (13.7)12 (0.9)380 (5.3)Pieriductur20 (1.1)292 (13.4)156 (1.1)522 (7.3)Norverdose mental status change50 (38.7)138 (4.1)14 (2.9)36 (5.5)Pieriductur20 (1.1)292 (1.5)156 (1.2)52 (1.3)Seizure0 (0.0)<	Reduced—1–2 finger lengths	0 (0.0)	660 (18.0)	0 (0.0)	1416 (19.9)
Missing 28 (1.5) 12 (0.3) 7 (0.5) 28 (0.4) Reduced neck mobility, n(%) 363 (32.9) 0 (0.0) 2336 (32.9) Missing 0 (0.0) 1644 (44.9) 0 (0.0) 2336 (32.9) Missing 0 (0.0) 0 (0.0) 10 (0.5) 104 (8.0) 3171 (44.6) Missing 108 (5.8) 976 (26.6) 104 (8.0) 3171 (44.6) Missing 0 (2.9) 20 (0.5) 9 (0.7) 40 (0.6) Thyromental distance, n(%) 110 (8.8) 1371 (44.6) 2 fingers 106 (5.3) 484 (12.2) 194 (14.9) 1236 (17.4) 3 fingers 0 (0.0) 1319 (36.0) (0.0) 180 (25.0) Not assessed 0 (0.0) 1319 (36.0) 0 (0.0) 3810 (53.6) Missing 3 (12.0) 100 (10.8) 32 (0.5) 100 (24.0) Not assessed 3 (12.0) 100 (10.0) 32 (0.5) 100 (10.0) 32 (0.5) Verdiactions, n (%) 100 (10.0) 25 (1.1) 1397 (10.0)	Not assessed	1183 (63.4)	1400 (38.2)	848 (65.0)	3129 (44.1)
Reduct mobility, n (%) 928 00.0 1644 (44.9) 0.0.0 236 (32.9) Missing 43 (2.3) 9 (0.2) 6 (0.5) 19 (0.3) Intubar impression of difficult, n (%) 7 6 0.0.0 104 (8.0) 317 (44.6) Missing 108 (5.2) 20 (0.5) 9 (0.7) 40 (0.6) Tyrometal distance, n (%) 1 1 100.05 137 (1.9) J fingers 9 (0.0) 319 (36.0) 0 (0.0) 130 (2.5) Not assessed 0 (0.0) 144 (3.9) 0 (0.0) 180 (2.5) Not assessed 1535 (82.2) 1705 (46.5) 0.91 (0.8) 319 (3.6.0) Vot assessed 1530 (28.4) 660 (18.0) 275 (21.1) 1397 (19.7) Orecrose 414 (22.2) 523 (14.3) 166 (12.7) 710 (10.0) Seizure 001 (10.8) 392 (0.7) 12 (0.9) 462 (6.8) Other 68 (63.7) 134 (3.2) 135 (6.2,1) 365 (6.1,2) Indinjury with hemorrhage 16 (0.9) <th< td=""><td>Missing</td><td>28 (1.5)</td><td>12 (0.3)</td><td>7 (0.5)</td><td>28 (0.4)</td></th<>	Missing	28 (1.5)	12 (0.3)	7 (0.5)	28 (0.4)
res 0.0.0 1644 (44.9.) 0.(0.0) 2336 (32.9) Missing 43 (2.3) 9 (0.2) 6 (0.5) 19 (0.3) Intubator impression of difficult, n (%) 19 (0.3) Yes 08 (5.8) 9 (0.2) 9 (0.7) 40 (0.6) Thyromental distance, n (%) 9 (0.7) 40 (0.6) 137 (1.9) 2 fingers 9 (0.5) 37 (1.0) 100 (0.8) 137 (1.9) 3 fingers 0 (0.0) 1319 (36.0) 0 (0.0) 1208 (24.0) 4 + fingers 0 (0.0) 134 (3.9) 0 (0.0) 1208 (24.0) 4 + fingers 0 (0.0) 134 (3.9) 0 (0.0) 1208 (24.0) 4 + fingers 0 (0.0) 144 (3.9) 0 (0.0) 1208 (24.0) Missing 37 (2.0) 140 (3.9) 0 (0.0) 120 (2.5) Norverdose mental strus change 50 (28.4) 660 (18.0) 275 (21.1) 3197 (19.7) Overdose 14 (22.2) 523 (14.3) 166 (12.7) 100 (10.0) Seizure 00 (1.10.8) 27	Reduced neck mobility, n (%)	0 (0 0)		2 (2 2)	0000 (00 0)
missing 45 (2.5) 9 (0.2) 6 (0.5) 19 (0.5) Intrabator impression of difficult, n (%) 108 (5.8) 976 (26.6) 104 (8.0) 3171 (44.6) Missing 54 (2.9) 20 (0.5) 9 (0.7) 40 (0.6) Thyromental distance, n (%) 11 10 (0.8) 137 (1.9) 1256 (17.4) 2 fingers 26 (15.3) 448 (12.2) 194 (14.9) 1266 (17.4) 3 fingers 0 (0.0) 1319 (36.0) 0 (0.0) 180 (2.5) Not assessed 055 (82.2) 1705 (46.5) 1091 (83.7) 3810 (53.6) Missing 37 (2.0) 1705 (46.5) 1091 (83.7) 320 (5.6) Not assessed 350 (28.4) 660 (18.0) 275 (21.1) 1397 (19.7) Overdose mental status change 530 (28.4) 660 (18.0) 276 (21.7) 13097 (19.7) Seizure 201 (10.8) 277 (7.6) 99 (7.6) 380 (5.3) Head injury with hemorrhage 16 (0.9) 392 (10.7) 12 (0.9) 476 (6.7) Polytrama 010.1 0.0 0.0	Yes	0 (0.0)	1644 (44.9)	0 (0.0)	2336 (32.9)
Number Solution Infracts, In (%) Normal Infracts, In (%) Norm(MISSINg	43 (2.3)	9 (0.2)	6 (0.5)	19 (0.3)
Nasing Solv (20.5) Def (20.7) Def (20.7) Def (20.7) Def (20.7) Def (20.7) Missing 54 (2.9) 20 (0.5) 9 (0.7) 40 (0.6) Thyromental distance, n (%) 10 (0.8) 137 (1.9) 2236 (17.4) 2 fingers 286 (15.3) 448 (12.2) 194 (14.9) 1236 (17.4) 3 fingers 0 (0.0) 1319 (36.0) 0 (0.0) 180 (2.5) Na sasessed 0 (0.0) 144 (3.9) 0 (0.0) 180 (2.5) Na sasessed 0 (0.0) 144 (3.9) 0 (0.0) 180 (2.5) Dip Indications, n (%) Top Indications, n (%) Top Indications, n (%) 1397 (19.7) 321 (0.7) Seizure 201 (10.8) 277 (7.6) 99 (7.6) 380 (5.3) Polytrauma 20 (1.1) 269 (7.3) 17 (1.3) 482 (6.8) Other 868 (36.7) 154 (42.1) 735 (56.4) 358 (51.5) Preinduction hypoxemia, n (%) Top (1.3) 155 (11.9) 522 (7.3) Missing 0 (0.0) 10.0 155 (11.9) 5	Vec	108 (5.8)	976 (26.6)	104 (8.0)	3171 (11 6)
International distance, n (%) For (%) For (%) For (%) For (%) 1 finger 9 (0.5) 37 (1.0) 10 (0.8) 137 (1.9) 2 fingers 286 (15.3) 448 (12.2) 194 (14.9) 1236 (17.4) 3 fingers 0 (0.0) 1319 (36.0) 0 (0.0) 1708 (24.0) 4 + fingers 0 (0.0) 144 (3.9) 0 (0.0) 180 (2.5) Not assessed 1535 (82.2) 1705 (46.5) 1091 (83.7) 3810 (53.6) Missing 37 (2.0) 11 (0.3) 9 (7.1) 1397 (19.7) Overdose mental status change 530 (28.4) 660 (18.0) 275 (21.1) 1397 (19.7) Overdose 414 (22.2) 523 (14.3) 166 (12.7) 710 (10.0) Seizure 201 (10.8) 292 (10.7) 12 (0.9) 476 (6.7) Polytrauma 20 (2.1,1) 299 (7.3) 17 (1.3) 482 (6.8) Other 686 (36.7) 154 (42.1) 75 (54.4) 3658 (51.5) Preiduction hypoxemia, n (%) ** ** ** ** ** </td <td>Missing</td> <td>54 (2.9)</td> <td>20 (0 5)</td> <td>9 (0 7)</td> <td>40 (0 6)</td>	Missing	54 (2.9)	20 (0 5)	9 (0 7)	40 (0 6)
Instruct values 9 (0.5) 37 (1.0) 10 (0.8) 137 (1.9) 2 fingers 286 (15.3) 448 (12.2) 194 (14.9) 1236 (17.4) 3 fingers 0 (0.0) 1319 (36.0) 0 (0.0) 1708 (24.0) 4 + fingers 0 (0.0) 144 (3.9) 0 (0.0) 180 (2.5) Not assessed 1535 (82.2) 1705 (46.5) 0.91 (83.7) 3810 (53.6) Missing 37 (2.0) 11 (0.3) 9 (0.7) 32 (0.5) Top Indications, n (%) 166 (12.7) 170 (10.0) Seizure 201 (10.8) 277 (7.6) 99 (7.6) 380 (5.3) Head injury with hemorrhage 16 (0.9) 392 (10.7) 12 (0.9) 476 (6.7) Polytrauma 20 (1.1) 269 (7.3) 17 (1.3) 482 (6.8) Other 68 (36.7) 124 (5.9) 158 (1.9) 522 (7.3) Missing 201 (10.8) 216 (5.9) 188 (1.2.1) 595 (8.4) Preinduction hypoxemia, n (%) Yet (s/90% Spo_2) 0 (0.0) 0 (0.0) 155 (1.9) <td< td=""><td>Thyromental distance n (%)</td><td>04 (2.0)</td><td>20 (0.0)</td><td>0 (0.1)</td><td>40 (0.0)</td></td<>	Thyromental distance n (%)	04 (2.0)	20 (0.0)	0 (0.1)	40 (0.0)
2 fingers 286 (15.3) 448 (12.2) 194 (14.9) 1236 (17.4) 3 fingers 0 (0.0) 1319 (36.0) 0 (0.0) 1708 (24.0) 4 + fingers 0 (0.0) 144 (3.9) 0 (0.0) 180 (2.5) Not assessed 1535 (82.2) 1705 (46.5) 1091 (83.7) 3810 (53.6) Missing 37 (2.0) 11 (0.3) 9 (0.7) 32 (0.5) Top Indications, n (%) 530 (28.4) 660 (18.0) 275 (21.1) 1397 (19.7) Overdose 414 (22.2) 523 (14.3) 166 (12.7) 710 (10.0) Seizure 20 (10.8) 277 (7.6) 99 (7.6) 380 (5.3) Head injury with hemorrhage 16 (0.9) 392 (10.7) 12 (0.9) 476 (6.7) Polytrauma 20 (1.1) 269 (7.3) 17 (1.3) 482 (6.8) Other 686 (36.7) 216 (5.9) 158 (12.1) 595 (8.4) Preinduction hypoxemia, n (%) 145 (42.9) 158 (37.1) 311 (23.8) 2472 (34.8) Normal (SBP 100–139 m Hg) 109 (59.4) 2290 (62.5)	1 finger	9 (0.5)	37 (1.0)	10 (0.8)	137 (1.9)
3 fingers0 (0.0)1319 (36.0)0 (0.0)1708 (24.0)4 + fingers0 (0.0)144 (3.9)0 (0.0)180 (2.5)Not assessed1535 (82.2)1705 (46.5)1091 (83.7)3810 (53.6)Missing37 (2.0)11 (0.3)9 (0.7)32 (0.5)Top Indications, n (%)	2 fingers	286 (15.3)	448 (12.2)	194 (14.9)	1236 (17.4)
4 + fingers 0 (0.0) 144 (3.9) 0 (0.0) 180 (2.5) Not assessed 1535 (82.2) 1705 (46.5) 1091 (83.7) 3810 (53.6) Missing 37 (2.0) 11 (0.3) 9 (0.7) 32 (0.5) Top Indications, n (%)	3 fingers	0 (0.0)	1319 (36.0)	0 (0.0)	1708 (24.0)
Not assessed 1535 (82.2) 1705 (46.5) 1091 (83.7) 3810 (53.6) Missing 37 (2.0) 11 (0.3) 9 (0.7) 32 (0.5) Top Indications, n (%) 397 (19.7) 397 (19.7) Nonoverdose mental status change 503 (28.4) 660 (18.0) 275 (21.1) 1397 (19.7) Overdose 414 (22.2) 523 (14.3) 166 (12.7) 710 (10.0) Seizure 201 (10.8) 277 (7.6) 99 (7.6) 380 (5.3) Polytrauma 20 (1.1) 269 (7.3) 17 (1.3) 482 (6.8) Other 686 (36.7) 1543 (42.1) 735 (56.4) 3658 (51.5) Preinduction hypoxemia, n (%) 52 (7.3) 3658 (51.5) Yes (<90% Spo_0)	4 + fingers	0 (0.0)	144 (3.9)	0 (0.0)	180 (2.5)
Missing 37 (2.0) 11 (0.3) 9 (0.7) 32 (0.5) Top Indications, n (%) Top Indications, n (%) 530 (28.4) 660 (18.0) 275 (21.1) 1397 (19.7) Nonoverdose mental status change 530 (28.4) 523 (14.3) 166 (12.7) 710 (10.0) Overdose 01 (10.8) 277 (7.6) 99 (7.6) 380 (5.3) Fead injury with hemorrhage 16 (0.9) 392 (10.7) 12 (0.9) 476 (6.7) Polytrauma 02 (1.1) 269 (7.3) 17 (1.3) 482 (6.8) Other 686 (36.7) 1543 (42.1) 735 (56.4) 3568 (51.5) Preinduction hypoxemia, n (%) 155 (11.9) 522 (7.3) 368 (51.5) Nissing 01.0.0 0.0.0.0 155 (11.9) 595 (8.4) Preinduction blood pressure, n (%) 155 (11.9) 595 (8.4) 595 (8.4) Normal (SBP >140 mm Hg) 733 (39.3) 1358 (37.1) 311 (23.8) 2472 (34.8) Normal (SBP 10-139 mm Hg) 1109 (59.4) 2290 (62.5) 465 (35.7) 2910 (41.0) Hypotensive (<100 mm Hg) -mo TX	Not assessed	1535 (82.2)	1705 (46.5)	1091 (83.7)	3810 (53.6)
Top Indications, n (%) Sind Case Sind Case <td>Missing</td> <td>37 (2.0)</td> <td>11 (0.3)</td> <td>9 (0.7)</td> <td>32 (0.5)</td>	Missing	37 (2.0)	11 (0.3)	9 (0.7)	32 (0.5)
Nonoverdose mental status change 530 (28.4) 660 (18.0) 275 (21.1) 1397 (19.7) Overdose 414 (22.2) 523 (14.3) 166 (12.7) 710 (10.0) Seizure 201 (10.8) 277 (7.6) 99 (7.6) 380 (5.3) Head injury with hemorrhage 16 (0.9) 392 (10.7) 12 (0.9) 476 (6.7) Polytrauma 20 (1.1) 269 (7.3) 17 (1.3) 482 (6.8) Other 086 (36.7) 1543 (42.1) 735 (56.4) 3658 (51.5) Preinduction hypoxemia, n (%) ************************************	Top Indications, n (%)				
Overdose 414 (22.2) 523 (14.3) 166 (12.7) 710 (10.0) Seizure 201 (10.8) 277 (7.6) 99 (7.6) 380 (5.3) Head injury with hemorrhage 16 (0.9) 392 (10.7) 12 (0.9) 476 (6.7) Polytrauma 20 (1.1) 269 (7.3) 17 (1.3) 482 (6.8) Other 686 (36.7) 1543 (42.1) 735 (56.4) 3658 (51.5) Preinduction hypoxemia, n (%) V V S22 (7.3) 522 (7.3) Yes (<90% Spo_2) 0 (0.0) 0 (0.0) 155 (11.9) 522 (7.3) Missing 201 (10.8) 2158 (37.1) 311 (23.8) 2472 (34.8) Normal (SBP >140 m Hg) 733 (39.3) 1358 (37.1) 311 (23.8) 2472 (34.8) Normal (SBP 100-139 mm Hg) 1109 (59.4) 2290 (62.5) 465 (35.7) 2910 (41.0) Hypotensive <100 mm Hg) —no TX 0 (0.0) 0 (0.0) 313 (4.4) 313 (4.4) Hypotensive <100 mm Hg) —IVF 0 (0.0) 0 (0.0) 322 (17.8) 862 (12.1) Hypotensive <100 mm Hg) —Pressor 0 (0.0)	Nonoverdose mental status change	530 (28.4)	660 (18.0)	275 (21.1)	1397 (19.7)
Seizure 201 (10.8) 277 (7.6) 99 (7.6) 380 (5.3) Head injury with hemorrhage 16 (0.9) 392 (10.7) 12 (0.9) 476 (6.7) Polytrauma 20 (1.1) 269 (7.3) 17 (1.3) 482 (6.8) Other 686 (36.7) 1543 (42.1) 735 (56.4) 3658 (51.5) Preinduction hypoxemia, n (%) 522 (7.3) 3658 (51.5) Yes (<90% Spo ₂) 0 (0.0) 0 (0.0) 155 (11.9) 522 (7.3) Missing 201 (10.8) 216 (5.9) 155 (11.9) 522 (7.3) Preinduction blood pressure, n (%) 595 (8.4) Hypertensive (SBP >140 mm Hg) 733 (39.3) 1358 (37.1) 311 (23.8) 2472 (34.8) Normal (SBP 100–139 mm Hg) 1109 (59.4) 2290 (62.5) 465 (35.7) 2910 (41.0) Hypotensive <100 mm Hg) —no TX	Overdose	414 (22.2)	523 (14.3)	166 (12.7)	710 (10.0)
Head injury with hemorrhage 16 (0.9) 392 (10.7) 12 (0.9) 476 (6.7) Polytrauma 20 (1.1) 269 (7.3) 17 (1.3) 482 (6.8) Other 686 (36.7) 1543 (42.1) 735 (56.4) 3658 (51.5) Preinduction hypoxemia, n (%) 522 (7.3) 522 (7.3) Yes (<90% Spo ₂) 0 (0.0) 0 (0.0) 155 (11.9) 522 (7.3) Missing 201 (10.8) 216 (5.9) 158 (12.1) 595 (8.4) Preinduction blood pressure, n (%) 511 (23.8) 2472 (34.8) Normal (SBP >140 mm Hg) 733 (39.3) 1358 (37.1) 311 (23.8) 2472 (34.8) Normal (SBP 100–139 mm Hg) 1109 (59.4) 2290 (62.5) 465 (35.7) 2910 (41.0) Hypotensive <100 mm Hg) —no TX	Seizure	201 (10.8)	277 (7.6)	99 (7.6)	380 (5.3)
Polytrauma 20 (1.1) 269 (7.3) 17 (1.3) 482 (6.8) Other 686 (36.7) 1543 (42.1) 735 (56.4) 3658 (51.5) Preinduction hypoxemia, n (%) 522 (7.3) 3658 (51.5) Yes (<90% Spo ₂) 0 (0.0) 0 (0.0) 155 (11.9) 522 (7.3) Missing 201 (10.8) 216 (5.9) 158 (12.1) 595 (8.4) Preinduction blood pressure, n (%) 511 (23.8) 2472 (34.8) Mypetensive (SBP >140 mm Hg) 733 (39.3) 1358 (37.1) 311 (23.8) 2472 (34.8) Normal (SBP 100–139 mm Hg) 1109 (59.4) 2290 (62.5) 465 (35.7) 2910 (41.0) Hypotensive <100 mm Hg) —no TX	Head injury with hemorrhage	16 (0.9)	392 (10.7)	12 (0.9)	476 (6.7)
Other 686 (36.7) 1543 (42.1) 735 (56.4) 3658 (51.5) Preinduction hypoxemia, n (%) Yes (<90% Spo ₂) 0 (0.0) 0 (0.0) 155 (11.9) 522 (7.3) Missing 201 (10.8) 216 (5.9) 158 (12.1) 595 (8.4) Preinduction blood pressure, n (%) Hypertensive (SBP >140 mm Hg) 733 (39.3) 1358 (37.1) 311 (23.8) 2472 (34.8) Normal (SBP 100–139 mm Hg) 1109 (59.4) 2290 (62.5) 465 (35.7) 2910 (41.0) Hypotensive (<100 mm Hg) —no TX	Polytrauma	20 (1.1)	269 (7.3)	17 (1.3)	482 (6.8)
Preinduction hypoxemia, n (%) Preinduction hypoxemia, n (%) 0 (0.0) 155 (11.9) 522 (7.3) Missing 201 (10.8) 216 (5.9) 158 (12.1) 595 (8.4) Preinduction blood pressure, n (%) 1 155 (31.9) 2472 (34.8) Normal (SBP >140 mm Hg) 733 (39.3) 1358 (37.1) 311 (23.8) 2472 (34.8) Normal (SBP 100–139 mm Hg) 1109 (59.4) 2290 (62.5) 465 (35.7) 2910 (41.0) Hypotensive (<100 mm Hg) —no TX	Other	686 (36.7)	1543 (42.1)	735 (56.4)	3658 (51.5)
Yes (<90% Sp02) 0 (0.0) 0 (0.0) 155 (11.9) 522 (7.3) Missing 201 (10.8) 216 (5.9) 158 (12.1) 595 (8.4) Preinduction blood pressure, n (%) 311 (23.8) 2472 (34.8) Normal (SBP >140 mm Hg) 733 (39.3) 1358 (37.1) 311 (23.8) 2472 (34.8) Normal (SBP 100–139 mm Hg) 1109 (59.4) 2290 (62.5) 465 (35.7) 2910 (41.0) Hypotensive (<100 mm Hg) —no TX	Preinduction hypoxemia, n (%)	0 (0 0)	0 (0 0)	155 (11.0)	E00 (7.2)
Missing 210 (10.5) 216 (5.9) 158 (12.1) 595 (8.4) Preinduction blood pressure, n (%) Hypertensive (SBP >140 mm Hg) 733 (39.3) 1358 (37.1) 311 (23.8) 2472 (34.8) Normal (SBP 100–139 mm Hg) 1109 (59.4) 2290 (62.5) 465 (35.7) 2910 (41.0) Hypotensive (<100 mm Hg) —no TX	Yes (<90% Spo ₂)	0 (0.0)	0 (0.0)	155 (11.9)	522 (7.3)
Hypertensive (SBP >140 mm Hg) 733 (39.3) 1358 (37.1) 311 (23.8) 2472 (34.8) Normal (SBP 100–139 mm Hg) 1109 (59.4) 2290 (62.5) 465 (35.7) 2910 (41.0) Hypotensive (<100 mm Hg) —no TX	Missing	201 (10.8)	216 (5.9)	158 (12.1)	595 (8.4)
Normal (SBP 100–139 mm Hg) 100 (50.4) 1000 (61.7) 011 (25.6) 2412 (34.6) Hypotensive (<100 mm Hg) — no TX	Hypertensive (SBP >140 mm Ha)	733 (39 3)	1358 (37.1)	311 (23.8)	2472 (34.8)
Hypotensive (<100 mm Hg) —no TX 0 (0.0) 0 (0.0) 110 (8.4) 313 (4.4) Hypotensive (<100 mm Hg) —IVF	Normal (SBP 100–139 mm Hg)	1109 (59 4)	2290 (62 5)	465 (35 7)	2910 (41 0)
Hypotensive (<100 mm Hg) —IVF 0 (0.0) 0 (0.0) 232 (17.8) 862 (12.1) Hypotensive (<100 mm Hg) —pressor	Hypotensive (<100 mm Hg) —no TX	0 (0.0)	0 (0.0)	110 (8.4)	313 (4.4)
Hypotensive (<100 mm Hg) —pressor 0 (0.0) 0 (0.0) 179 (13.7) 517 (7.3) Missing 25 (1.3) 16 (0.4) 7 (0.5) 29 (0.4)	Hypotensive (<100 mm Hg) —IVF	0 (0.0)	0 (0.0)	232 (17.8)	862 (12.1)
Missing 25 (1.3) 16 (0.4) 7 (0.5) 29 (0.4)	Hypotensive (<100 mm Hg) —pressor	0 (0.0)	0 (0.0)	179 (13.7)	517 (7.3)
	Missing	25 (1.3)	16 (0.4)	7 (0.5)	29 (0.4)

Abbreviations: ADA, anatomically difficult airway; BMI, body mass index; IQR, interquartile range; IVF, intravenous fluids; PDA, physiologically difficult airway; Pressor, vasopressor medication; SBP, systolic blood pressure; TX, treatment.

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ANESTHESIA & ANALGESIA

Table 3. Intubator Characteristics and Intubation Management

Variable Neither ADA PDA Both n 1867 3664 1304 7103 Intubator training level, n (%) 7103 PGY-1 224 (12.0) 422 (11.5) 135 (10.4) 861 (12.1) PGY-3 872 (46.7) 1511 (41.2) 514 (93.4) 2858 (37.8) PGY-5 of (40w 54 (2.9) 131 (3.6) 35 (2.7) 194 (2.7) Attending 53 (2.8) 113 (3.1) 35 (2.7) 129 (2.2) 163 (2.3) Peosystention time, n (%) 133 (7.6) 35 (2.7) 59 (6.6) Careater than 3 min 289 (14.5) 65 (2.1) 80 (.7) 72 (1.2) 1-3 min 289 (19.5) 65 (2.1) 27 (2.3) 2426 (39.0) Perioritubation proproxygenation 0 (0.0) 0 (0.0) 134 (76.0) 272 (23.0) 2426 (39.0) Immediate intubation proproxygenation 0 (0.0) 0 (0.0) 18 (1.4) 70 (1.0) Phenryleiphrine 0 (0.0) 0 (0.0)<		Difficult airway group			
n 1867 3664 1304 7103 PKV1 224 (12.0) 422 (11.5) 135 (10.4) 86 (12.1) PKV2 499 (26.7) 1095 (29.9) 436 (33.4) 2376 (33.4) PKV3 872 (46.7) 1511 (41.2) 514 (39.4) 2688 (37.8) PKV3-5 relow 54 (2.9) 131 (3.6) 35 (2.7) 194 (2.7) Attending 53 (2.8) 113 (3.1) 35 (2.7) 232 (3.3) Missing 66 (2.4) 65 (2.2.8) 67 (5.7) 595 (9.6) Greater than 1min 165 (2.4) 272 (2.6) 252 (2.6) 3129 (50.3) Peri-intubation pressor (first attempt), n (%) 228 (19.5) 65 (2.1.8) 67 (5.7) 595 (9.6) Greater than 3min 158 (78.4) 228 (17.6) 127 (2.2) 242 (32.0) Peri-intubation pressor (first attempt), n (%) 0 (0.0) 0 (0.0) 18 (1.4) 70 (1.0) Peri-intubation pressor (first attempt), n (%) 0 (0.0) 19 (1.5) 79 (1.1) Mutipie 0 (0.0,0 0 (0.0) 19 (1.5)	Variable	Neither	ADA	PDA	Both
Intubator training level, n (%)Set 1 (12.1)135 (10.4)Set 1 (12.1)PGY-1499 (26.7)1096 (29.9)436 (33.4)2376 (33.4)PGY-3872 (46.7)1511 (41.2)514 (39.4)2688 (37.8)PGY-3153 (7.4)304 (8.3)120 (9.2)590 (8.3)PGY-55 or fellow54 (2.9)131 (3.1)35 (2.7)124 (2.7)Attending53 (2.8)113 (3.1)35 (2.7)129 (2.3)MissingC6 (1.4)88 (2.4)29 (2.2)133 (2.3)Proxygenation time, n (%)55 (2.1)67 (6.7)56 (9.6)Greater than 3 min26 (2.4)655 (2.1.8)67 (6.7)56 (9.6)Greater than 3 min1158 (78.1)2281 (76.0)272 (23.0)2426 (39.0)Immediate intubation—no proxygenation0 (0.0)0 (0.0)84 (1.0.5)312 (50.3)Preintinubetion preson (first attempt), n (%)0 (0.0)18 (1.4)70 (1.0)Pherephrine0 (0.0)0 (0.0)19 (1.5)79 (1.1)Multiple0 (0.0)0 (0.0)19 (1.5)79 (1.1)Proxygenation, n (%)T22 (17.0)1815 (25.6)Preoxygenation devices, n (%)S2 (73.0)2095 (29.5)28 (3.2)Missing350 (1.7)44 (1.5)42 (1.2)20.079 (1.1)Proxygenation devices, n (%)S2 (7.1)184 (1.6,7)298 (7.6)28 (3.2)Missing150 (1.8)169 (1.1)164 (4.6)63 (4.8)502 (7.1)Beg valve mask167 (6.9)49 (1.7)94	n	1867	3664	1304	7103
PPN-1 224 (12.0) 422 (11.5) 135 (10.4) 861 (12.1) PPN-2 499 (26.7) 1511 (41.2) 514 (39.4) 275 (33.4) PPN-4 139 (7.4) 304 (8.3) 120 (9.2) 500 (8.3) PRY-25 or follow 54 (2.9) 131 (3.6) 35 (2.7) 194 (2.7) Attending 53 (2.8) 113 (3.1) 35 (2.7) 123 (2.3) Missing 26 (2.4) 88 (2.4) 29 (2.2) 153 (2.3) Preoxgenation time, n (%) E E E E Less than 1 min 66 (2.4) 65 (2.1.8) 67 (5.7) 555 (9.6) Greater than 3 min 1158 (78.1) 2281 (76.0) 272 (2.3) 2426 (39.0) Preorinduction preoscor (first attempt), n (%) U 0.00 0.00 15 (1.2) 44 (0.6) Preorinduction preoscor (first attempt), n (%) U U 0.00 10.01 10.02 Preorygenation devices, n (%) U 0.00 0.00 18 (1.4) 10 (2.5) Mareid case devices, n (%) U U	Intubator training level, n (%)				
PPV2 499 (26,7) 1095 (29,9) 436 (33,4) 2275 (33,4) POV3 139 (7,4) 304 (8,3) 120 (9,2) 508 (8,3) PGY25 or fellow 53 (2,8) 113 (3,6) 35 (2,7) 194 (2,7) Attending 53 (2,8) 113 (3,6) 35 (2,7) 194 (2,7) Missing 26 (1,4) 88 (2,4) 29 (2,2) 153 (2,3) Persystenton time, n (%) 115 (76,7) 555 (9,6) 655 (2,1,8) 67 (5,7) 555 (9,6) Greater than 3 min 1158 (78,1) 2281 (76,0) 272 (23,0) 2426 (39,0) Immediate intubation—on proxygenation 0 (0,0) 0 (0,0) 834 (70,6) 3129 (50,3) Peri-intubation pressor (first attempt), n (%) 11 (0,2) 44 (0,6) Norepinephrine 0 (0,0) 13 (1,4) 70 (1,0) Phorepinphrine 0 (0,0) 0 (0,0) 18 (1,4) 70 (1,0) Phorepinphrine 0 (0,0) 0 (0,0) 19 (1,5) 71 (1,1) Multiple 0 (0,0) 0 (0,0) 18 (1,6,7) 2095 (52,5) Missing </td <td>PGY-1</td> <td>224 (12.0)</td> <td>422 (11.5)</td> <td>135 (10.4)</td> <td>861 (12.1)</td>	PGY-1	224 (12.0)	422 (11.5)	135 (10.4)	861 (12.1)
PPN3 872 (46.7) 151 (41.2) 514 (43.9, 4) 2688 (37.8) PGY4 30 (7.4) 304 (8.3) 120 (9.2) 590 (8.3) PGY25 or fellow 54 (2.9) 131 (3.6) 35 (2.7) 134 (2.3) Missing 26 (1.4) 88 (2.4) 29 (2.2) 163 (2.3) Preoxygenation time, n (%) 86 (2.4) 65 (2.2) 8 (0.7) 72 (1.2) 1-3 min 289 (19.5) 655 (21.8) 67 (5.7) 595 (9.6) Greater than 3 min 158 (78.1) 2281 (76.0) 272 (2.3) 2426 (39.0) Immediate intubation—no preoxygenation 0 (0.0) 0 (0.0) 834 (70.6) 3129 (50.3) Peri-intubation pressor (first attempt), n (%) 44 (0.6) 10.0 Phenylephrine 0 (0.0) 0 (0.0) 19 (1.5) 79 (1.1) Multiple 0 (0.0) 0 (0.0) 18 (1.6,7) 2095 (25.5) Missing 973 (52.1) 2085 (56.9) 218 (16.7) 2095 (25.5) Missing 964 (51.6) 1909 (52.1) 22 (0.7) <td>PGY-2</td> <td>499 (26.7)</td> <td>1095 (29.9)</td> <td>436 (33.4)</td> <td>2375 (33.4)</td>	PGY-2	499 (26.7)	1095 (29.9)	436 (33.4)	2375 (33.4)
PPY-4 139 (7.4) 304 (8.3) 120 (9.2) 508 (8.3) PY>25 or fellow 54 (2.9) 131 (3.6) 35 (2.7) 134 (2.7) Missing 26 (1.4) 88 (2.4) 29 (2.2) 153 (2.3) Proxygenation time, n (%) Less than 1 min 36 (2.4) 65 (2.1) 67 (5.7) 555 (9.6) Greater than 3 min 1158 (78.1) 2281 (76.0) 272 (23.0) 2426 (39.0) Immediate intubation—no preoxygenation 0 (0.0) 0 (0.0) 834 (70.6) 3129 (50.3) Perintubation pressor (first attempt), n (%) 44 (0.6) Prorepiperbrine 0 (0.0) 0 (0.0) 15 (1.2) 44 (0.6) Norepinephrine 0 (0.0) 0 (0.0) 19 (1.5) 79 (1.1) Mutiple 0 (0.0) 0 (0.0) 19 (1.5) 79 (1.1) Mutiple 0 (0.0) 0 (0.0) 19 (1.5) 79 (1.1) Missing 373 (52.1) 208 (56.9) 218 (16.7) 2095 (29.5) Missin	PGY-3	872 (46.7)	1511 (41.2)	514 (39.4)	2688 (37.8)
PAYS for fellow 54 (2.9) 131 (3.6) 35 (2.7) 194 (2.7) Attending 53 (2.8) 113 (3.1) 35 (2.7) 232 (3.3) Missing 26 (1.4) 88 (2.4) 29 (2.2) 163 (2.3) Preoxgenation time, n (%) 55 (2.1.8) 67 (5.7) 595 (9.6) Greater than 3 min 1158 (78.1) 228 (176.0) 272 (2.3.0) 2426 (39.0) Immediate intubation—no preoxgenation 0 (0.0) 0 (0.0) 834 (70.6) 3129 (50.3) Peri-intubation pressor (first attempt), n (%) 51 (2.2) 44 (0.6) Norepinephrine 0 (0.0) 0 (0.0) 15 (1.2) 44 (0.6) Noreginephrine 0 (0.0) 0 (0.0) 19 (1.5) 79 (1.1) Multiple 0 (0.0) 0 (0.0) 40 (0.3) 11 (0.2) Preoxgenation, n (%) 218 (16.7) 2095 (29.5) Missing 382 (20.5) 664 (18.1) 952 (7.3) 48 (3.2) Preoxgenation devices, n (%) 229 (1.7) 142 (0.6) 28 (3.2)	PGY-4	139 (7.4)	304 (8.3)	120 (9.2)	590 (8.3)
Attending 53 (2.8) 113 (3.1) 35 (2.7) 232 (3.3) Missing 26 (1.4) 88 (2.4) 29 (2.2) 163 (2.3) Preoxgenation time, n (%) 88 (2.4) 29 (2.2) 163 (2.3) Less than 1 min 36 (2.4) 65 (2.2) 8 (0.7) 72 (1.2) 1–3 min 289 (19.5) 655 (2.18) 67 (5.7) 595 (9.6) Greater than 3 min 1158 (78.1) 2281 (76.0) 272 (23.0) 2426 (39.0) Immediate intubation – no preoxgenation 0 (0.0) 0 (0.0) 15 (1.2) 44 (0.6) Norepinephrine 0 (0.0) 0 (0.0) 15 (1.2) 44 (0.6) Norepinephrine 0 (0.0) 0 (0.0) 15 (1.2) 44 (0.6) Multiple 0 (0.0) 0 (0.0) 40.3 11 (0.2) Apneic oxgenation n (%) 120 (1.6) 1909 (52.1) 222 (17.0) 85 (25.6) Wess dannula 164 (51.6) 1909 (52.1) 222 (17.0) 85 (25.6) Nonebreather facemask 166 (45.1) 1909 (52.1) 222 (17.0) 85 (25.6) <	PGY≥5 or fellow	54 (2.9)	131 (3.6)	35 (2.7)	194 (2.7)
Missing 26 (1.4) 88 (2.4) 29 (2.2) 163 (2.3) Preoxygenation time, n (%)	Attending	53 (2.8)	113 (3.1)	35 (2.7)	232 (3.3)
Preosgenation time, n (%) Section time, n (%) Sectin (N) Section time, n (%)	Missing	26 (1.4)	88 (2.4)	29 (2.2)	163 (2.3)
Less than 1 min 36 (2.4) 65 (2.2) 8 (0.7) 72 (1.2)1-3 min289 (19.5) 655 (21.8) 67 (5.7) 595 (9.6)Greater than 3 min1158 (78.1)2281 (76.0)272 (23.0)2426 (39.0)Immediate intubation—no preoxygenation 0 (0.0) 0 (0.0) 834 (70.6) 3129 (50.3)Peri-intubation—no preoxygenation 0 (0.0) 0 (0.0) 15 (1.2) 44 (0.6)Norepinephrine 0 (0.0) 0 (0.0) 19 (1.5) 79 (1.1)Multiple 0 (0.0) 0 (0.0) 4 (0.3) 11 (0.2)Apneic oxygenation, n (%) Yes 73 (52.1) 2085 (56.9) 218 (16.7) 2095 (29.5)Missing 382 (20.5) 664 (18.1) 952 (73.0) 4005 (56.4)Preoxygenation devices, n (%) Yes 222 (17.0) 1815 (25.6)CPAP/BPAP169 (9.1) 168 (4.6) 63 (4.8) 502 (7.1)Bag valve mask167 (8.9) 485 (13.2) 42 (3.2) 396 (56.1)Nonebreather facemask 954 (51.6) 1909 (52.1) 120.9 228 (3.2)Missing 350 (18.7) 649 (17.7) 947 (72.6) 3987 (56.1)Other 75 (4.0) 194 (5.3) 18 (1.4) 175 (2.5)Video laryngoscopy, n (%) 1238 (66.3) 2635 (71.9) 801 (61.4)Bogie us on first attempt, n (%) 41 (1.2) 66 (26.2) 79 (1.1)Uteo laryngoscopy, n (%) 130 (7.0) 512 (4.3) 116 (1.7)Missing </td <td>Preoxygenation time, n (%)</td> <td></td> <td></td> <td></td> <td></td>	Preoxygenation time, n (%)				
1-3 min289 (19.5)655 (21.8)67 (6.7)595 (9.6)Greater than 3 min1158 (78.1)2281 (76.0)272 (23.0)2426 (39.0)Immediate intubation—no preoxygenation0 (0.0)0 (0.0)834 (70.6)324 (50.3)Peri-intubation pressor (first attempt), n (%) </td <td>Less than 1 min</td> <td>36 (2.4)</td> <td>65 (2.2)</td> <td>8 (0.7)</td> <td>72 (1.2)</td>	Less than 1 min	36 (2.4)	65 (2.2)	8 (0.7)	72 (1.2)
Greater than 3 min1158 (78.1)2281 (76.0)272 (23.0)2426 (39.0)Immediate intubation—no preoxygenation000000334 (70.6)3129 (50.3)Perlintubation—no preoxygenation000000015 (1.2)44 (0.6)Norepinephrine0000018 (1.4)70 (1.0)Norepinephrine0000019 (1.5)79 (1.1)Multiple000000010 (0.2)Apneic oxygenation, n(%)783 (52.1)2085 (56.9)218 (16.7)2095 (29.5)Missing973 (52.1)2085 (56.9)218 (16.7)2095 (29.5)Missing82 (20.5)664 (18.1)952 (73.0)405 (56.4)Preoxygenation devices, n(%)169 (9.1)166 (4.6)63 (4.8)502 (7.1)Bag valve mask167 (8.9)485 (13.2)42 (3.2)366 (5.6)Nasal cannula142 (7.6)259 (7.1)12 (0.9)228 (3.2)Missing350 (18.7)649 (17.7)947 (72.6)3987 (56.1)Other75 (4.0)194 (5.3)18 (1.4)175 (2.5)Video laryngoscopy, n(%)1238 (66.3)263 (71.9)801 (61.4)5074 (71.4)Bouge use on first attempt, n(%)130 (7.0)65 (1.8)39 (3.0)124 (1.7)Missing130 (7.0)65 (1.8)39 (3.0)124 (1.7)Missing130 (7.0)65 (1.8)39 (3.0)124 (1.7) </td <td>1–3 min</td> <td>289 (19.5)</td> <td>655 (21.8)</td> <td>67 (5.7)</td> <td>595 (9.6)</td>	1–3 min	289 (19.5)	655 (21.8)	67 (5.7)	595 (9.6)
Immediate intubation—no preoxygenation 0 (0.0) 0 (0.0) 834 (70.6) 3129 (50.3) Peri-intubation pressor (first attempt), n (%) 44 (0.6) Norepinephrine 0 (0.0) 0 (0.0) 15 (1.2) 44 (0.6) Norepinephrine 0 (0.0) 0 (0.0) 19 (1.5) 79 (1.1) Multiple 0 (0.0) 0 (0.0) 4 (0.3) 11 (0.2) Apneic oxygenation, n (%) 2085 (56.9) 218 (16.7) 2095 (29.5) Missing 973 (52.1) 2085 (56.9) 218 (16.7) 2095 (29.5) Missing 973 (52.1) 1699 (52.1) 222 (17.0) 1815 (25.6) Preoxygenation devices, n (%) Norrebreather facemask 964 (51.6) 1909 (52.1) 220 (17.0) 1815 (25.6) Nonarberather facemask 167 (8.9) 485 (13.2) 42 (3.2) 396 (56.1) Nasal cannula 142 (7.6) 259 (7.1) 12 (0.9) 228 (3.2) Missing 1228 (66.3) 2635 (71.9) 801 (61.4) 5074 (71.4) <tr< td=""><td>Greater than 3 min</td><td>1158 (78.1)</td><td>2281 (76.0)</td><td>272 (23.0)</td><td>2426 (39.0)</td></tr<>	Greater than 3 min	1158 (78.1)	2281 (76.0)	272 (23.0)	2426 (39.0)
Peri-intubation pressor (first attempt), n (%) Epinephrine 0 (0.0) 0 (0.0) 15 (1.2) 44 (0.6) Norepinephrine 0 (0.0) 0 (0.0) 18 (1.4) 70 (1.0) Phenylephrine 0 (0.0) 0 (0.0) 19 (1.5) 79 (1.1) Mutiple 0 (0.0) 0 (0.0) 4 (0.3) 11 (0.2) Apneic oxygenation, n (%) Yes 973 (52.1) 2085 (56.9) 218 (16.7) 2095 (29.5) Missing 82 (20.5) 664 (18.1) 952 (73.0) 4005 (56.4) Preoxygenation devices, n (%) Norebreather facemask 964 (51.6) 1909 (52.1) 222 (17.0) 1815 (25.6) CPAP/BPAP 169 (9.1) 168 (4.6) 63 (4.8) 502 (7.1) Bag valve mask 167 (8.9) 485 (13.2) 42 (3.2) 396 (5.6) Nasal cannula 142 (7.6) 259 (7.1) 12 (0.9) 228 (3.2) Missing 350 (18.7) 649 (17.7) 947 (72.6) 3987 (56.1) Other 75 (4.0) 194 (5.3) 18 (1.4) 175 (2.5) Video laryngoscopy, n (%) 1238 (66.3) 2635 (71.9) 801 (61.4) 5074 (71.4) Bougie use on first attempt, n (%) Yes 458 (24.5) 726 (19.8) 203 (15.6) 1189 (16.7) Missing 130 (7.0) 65 (1.8) 39 (3.0) 124 (1.7) Missing 130 (7.0) 65 (1.8) 39 (3.0) 124 (1.7) Propofol 67 (3.6) 121 (3.3) 26 (2.0) 149 (2.1) Ftomidate 152 (8.1) 334 (9.1) 188 (4.4) 1017 (14.3) Midazolam 17 (0.9) 30 (0.8) 13 (1.0) 52 (0.7) Propofol 67 (3.6) 121 (3.3) 26 (2.0) 149 (2.1) ParaNitic medication, n (%) Ketamine Mid2 (1.6) 52 (1.7) 538 (41.3) 3279 (46.2) Wecuronium 40 (0.2) 4 (0.1) 4 (0.3)	Immediate intubation—no preoxygenation	0 (0.0)	0 (0.0)	834 (70.6)	3129 (50.3)
Epinephrine 0 (0.0) 0 (0.0) 15 (1.2) 44 (0.6) Norepinephrine 0 (0.0) 0 (0.0) 18 (1.4) 70 (1.0) Multiple 0 (0.0) 0 (0.0) 19 (1.5) 79 (1.1) Multiple 0 (0.0) 0 (0.0) 4 (0.3) 11 (0.2) Apnetic oxygenation, n (%) 2085 (56.9) 218 (16.7) 2095 (29.5) Missing 382 (20.5) 664 (18.1) 952 (73.0) 4005 (56.4) Preoxygenation devices, n (%) 222 (17.0) 1815 (25.6) OPAP/BPAP 169 (9.1) 168 (4.6) 63 (4.8) 502 (7.1) Bag valve mask 167 (8.9) 485 (13.2) 42 (3.2) 396 (5.6) Nasal cannula 142 (7.6) 259 (7.1) 12 (0.9) 228 (3.2) Missing 350 (18.7) 649 (17.7) 947 (72.6) 3987 (56.1) Other 75 (4.0) 194 (5.3) 18 (1.4) 175 (2.5) Video laryngoscopy, n (%) 1238 (66.3) 263 (71.9) 203 (15.6) 1189 (Peri-intubation pressor (first attempt), n (%)				
Norepinephrine 0 (0.0) 0 (0.0) 18 (1.4) 70 (1.0) Phenylephrine 0 (0.0) 0 (0.0) 19 (1.5) 79 (1.1) Multiple 0 (0.0) 0 (0.0) 19 (1.5) 79 (1.1) Multiple 0 (0.0) 0 (0.0) 4 (0.3) 11 (0.2) Apneic oxygenation, n (%) 2085 (56.9) 218 (16.7) 2095 (29.5) Missing 382 (20.5) 664 (18.1) 952 (73.0) 4005 (56.4) Preoxygenation devices, n (%) 1909 (52.1) 222 (17.0) 1815 (25.6) CPAP/BPAP 169 (9.1) 168 (4.6) 63 (4.8) 502 (7.1) Bag valve mask 167 (8.9) 485 (13.2) 42 (3.2) 396 (56.1) Nasal cannula 142 (7.6) 259 (7.1) 12 (0.9) 228 (3.2) Other 75 (4.0) 194 (5.3) 18 (1.4) 175 (2.5) Other 158 (24.5) 726 (19.8) 203 (15.6) 1189 (16.7) Missing 91 (4.9) 44 (1.2) 26 (2.0) 79 (1.1) BURP maneuver, n (%) 120 (7.0)	Epinephrine	0 (0.0)	0 (0.0)	15 (1.2)	44 (0.6)
Phenylephrine 0 (0.0) 0 (0.0) 19 (1.5) 79 (1.1) Multiple 0 (0.0) 0 (0.0) 4 (0.3) 11 (0.2) Apneic oxygenation, n (%) Yes 973 (52.1) 2085 (56.9) 218 (16.7) 2095 (29.5) Missing 382 (20.5) 664 (18.1) 952 (73.0) 4005 (56.4) Preoxygenation devices, n (%) Nonrebreather facemask 964 (51.6) 1909 (52.1) 222 (17.0) 1815 (25.6) CPAP/BPAP 169 (9.1) 168 (4.6) 63 (4.8) 502 (7.1) Bag valve mask 167 (8.9) 485 (13.2) 42 (3.2) 396 (5.6) Nasal cannula 142 (7.6) 259 (7.1) 12 (0.9) 228 (3.2) Missing 350 (18.7) 649 (17.7) 947 (72.6) 3987 (56.1) Other 75 (4.0) 194 (5.3) 18 (1.4) 175 (2.5) Video laryngoscopy, n (%) 1238 (63.2) 2635 (71.9) 801 (61.4) 5074 (71.4) Bougie use on first attempt, n (%) Yes 366 (20.7) 963 (26.3) 274 (21.0) 1863 (26.2) <td>Norepinephrine</td> <td>0 (0.0)</td> <td>0 (0.0)</td> <td>18 (1.4)</td> <td>70 (1.0)</td>	Norepinephrine	0 (0.0)	0 (0.0)	18 (1.4)	70 (1.0)
Multiple 0 (0.0) 0 (0.0) 4 (0.3) 11 (0.2) Apneic oxygenation, n (%)	Phenylephrine	0 (0.0)	0 (0.0)	19 (1.5)	79 (1.1)
Apnelic oxygenation, n (%)Yes973 (52.1)2085 (56.9)218 (16.7)2095 (29.5)Yes973 (52.1)2085 (56.9)952 (73.0)4005 (56.4)Preoxygenation devices, n (%)952 (73.0)4005 (56.4)Norrebreather facemask964 (51.6)1909 (52.1)222 (17.0)1815 (25.6)CPAP/BPA169 (9.1)168 (4.6)63 (4.8)502 (7.1)Bag valve mask167 (8.9)485 (13.2)42 (3.2)396 (5.6)Nasal cannula142 (7.6)259 (7.1)12 (0.9)228 (3.2)Missing350 (18.7)649 (17.7)947 (72.6)3987 (56.1)Other75 (4.0)194 (5.3)18 (1.4)175 (2.5)Video laryngoscopy, n (%)1238 (66.3)2635 (71.9)801 (61.4)5074 (71.4)Bougie use on first attempt, n (%)Yes726 (19.8)203 (15.6)1189 (16.7)Wes386 (20.7)963 (26.3)274 (21.0)1863 (26.2)Missing103 (7.0)65 (1.8)39 (3.0)124 (1.7)Induction medication, n (%)Etomidate131 (87.4)3179 (86.8)1077 (82.6)5885 (82.9)Ketamine152 (8.1)334 (9.1)188 (14.4)1017 (14.3)Midazolam17 (0.9)30 (0.8)13 (1.0)52 (0.7)Propofol67 (3.6)121 (3.3)26 (2.0)149 (2.1)Paralytic medication, n (%)Etomidate133 (1.0)52 (0.7)Propofol67 (3.6)121 (3.3)26 (2.0)149 (2.1)Paralytic medication, n (%) </td <td>Multiple</td> <td>0 (0.0)</td> <td>0 (0.0)</td> <td>4 (0.3)</td> <td>11 (0.2)</td>	Multiple	0 (0.0)	0 (0.0)	4 (0.3)	11 (0.2)
Yes 973 (52.1) 2085 (56.9) 218 (16.7) 2095 (29.5) Missing 382 (20.5) 664 (18.1) 952 (73.0) 4005 (56.4) Preoxygenation devices, n (%) Nonrebreather facemask 964 (51.6) 1909 (52.1) 222 (17.0) 1815 (25.6) CPAP/BPAP 169 (9.1) 168 (4.6) 63 (4.8) 502 (7.1) Bag valve mask 167 (8.9) 485 (13.2) 42 (3.2) 396 (5.6) Nasal cannula 142 (7.6) 259 (7.1) 12 (0.9) 228 (3.2) Missing 350 (18.7) 649 (17.7) 947 (72.6) 3987 (56.1) Other 75 (4.0) 194 (5.3) 18 (1.4) 175 (2.5) Video laryngoscopy, n (%) 1238 (66.3) 2635 (71.9) 801 (61.4) 5074 (71.4) Bougie use on first attempt, n (%) 26 (2.0) 79 (1.1) BURP maneuver, n (%) 26 (2.0) 79 (1.1) BURP maneuver, n (%) 274 (21.0) 1863 (26.2)	Apneic oxygenation, n (%)				
Missing 382 (20.5) 664 (18.1) 952 (73.0) 4005 (56.4) Preoxygenation devices, n (%) <	Yes	973 (52.1)	2085 (56.9)	218 (16.7)	2095 (29.5)
Preoxygenation devices, n (%) Nonrebreather facemask 964 (51.6) 1909 (52.1) 222 (17.0) 1815 (25.6) CPAP/BPA 169 (9.1) 168 (4.6) 63 (4.8) 502 (7.1) Bag valve mask 167 (8.9) 485 (13.2) 42 (3.2) 396 (5.6) Nasal cannula 142 (7.6) 259 (7.1) 12 (0.9) 228 (3.2) Missing 350 (18.7) 649 (17.7) 947 (72.6) 3987 (56.1) Other 75 (4.0) 194 (5.3) 18 (1.4) 175 (2.5) Video laryngoscopy, n (%) 1238 (66.3) 2635 (71.9) 801 (61.4) 5074 (71.4) Bougie use on first attempt, n (%) 148 (16.7) 1189 (16.7) Missing 91 (4.9) 44 (1.2) 26 (2.0) 198 (16.7) BURP maneuver, n (%) 124 (1.7) Induction medication, n (%) 124 (1.7) 1863 (26.2) Missing 103 (7.0) 65 (1.8) 39 (3.0) 124 (1.7) Induction medication, n (%) 137 (86.8) <td>Missing</td> <td>382 (20.5)</td> <td>664 (18.1)</td> <td>952 (73.0)</td> <td>4005 (56.4)</td>	Missing	382 (20.5)	664 (18.1)	952 (73.0)	4005 (56.4)
Nonrebreather facemask 964 (51.6) 1909 (52.1) 222 (17.0) 1815 (25.6) CPAP/BPAP 169 (9.1) 168 (4.6) 63 (4.8) 502 (7.1) Bag valve mask 167 (8.9) 485 (13.2) 42 (3.2) 396 (5.6) Nasal cannula 142 (7.6) 259 (7.1) 12 (0.9) 228 (3.2) Missing 350 (18.7) 649 (17.7) 947 (72.6) 3987 (56.1) Other 75 (4.0) 194 (5.3) 18 (1.4) 175 (2.5) Vide laryngoscopy, n (%) 1238 (66.3) 2635 (71.9) 801 (61.4) 504 (71.4) Bougie use on first attempt, n (%) Yes 458 (24.5) 726 (19.8) 203 (15.6) 1189 (16.7) Missing 91 (4.9) 44 (1.2) 26 (2.0) 79 (1.1) BURP maneuver, n (%) Yes 386 (20.7) 963 (26.3) 274 (21.0) 1863 (26.2) Missing 130 (7.0) 65 (1.8) 39 (3.0) 124 (1.7) Induction medication, n (%) Yes 5885 (82.9) Ketamine 152 (8.1) 3179 (86.8) 1077 (82.6) 5	Preoxygenation devices, n (%)				
CPAP/BPAP 169 (9.1) 168 (4.6) 63 (4.8) 502 (7.1) Bag valve mask 167 (8.9) 485 (13.2) 42 (3.2) 396 (5.6) Nasal cannula 142 (7.6) 259 (7.1) 12 (0.9) 228 (3.2) Missing 350 (18.7) 649 (17.7) 947 (72.6) 398 (56.1) Other 75 (4.0) 194 (5.3) 18 (1.4) 175 (2.5) Video laryngoscopy, n (%) 1238 (66.3) 2635 (71.9) 801 (61.4) 5074 (71.4) Bougie use on first attempt, n (%) 458 (24.5) 726 (19.8) 203 (15.6) 1189 (16.7) Wissing 91 (4.9) 44 (1.2) 26 (2.0) 79 (1.1) BURP maneuver, n (%) 124 (1.7) 1863 (26.2) Yes 386 (20.7) 963 (26.3) 274 (21.0) 1863 (26.2) Induction medication, n (%) 124 (1.7) Induction medication, n (%) 1077 (82.6) 5885 (82.9) 124 (1.7) Nidazolam 152 (8.1) 334 (9.1) 188 (14.4) 1017 (14.3)	Nonrebreather facemask	964 (51.6)	1909 (52.1)	222 (17.0)	1815 (25.6)
Bag valve mask 167 (8.9) 485 (13.2) 42 (3.2) 396 (5.6) Nasal cannula 142 (7.6) 259 (7.1) 12 (0.9) 228 (3.2) Missing 350 (18.7) 649 (17.7) 947 (72.6) 3987 (56.1) Other 75 (4.0) 194 (5.3) 18 (1.4) 175 (2.5) Video laryngoscopy, n (%) 1238 (66.3) 2635 (71.9) 801 (61.4) 5074 (71.4) Bougie use on first attempt, n (%) 458 (24.5) 726 (19.8) 203 (15.6) 1189 (16.7) Missing 91 (4.9) 44 (1.2) 26 (2.0) 79 (1.1) BURP maneuver, n (%) 130 (7.0) 65 (18.8) 39 (3.0) 124 (1.7) Induction medication, n (%) 152 (8.1) 334 (9.1) 188 (14.4) 1017 (14.3) Midazolam 17 (0.9) 30 (0.8) 13 (1.0) 52 (0.7) Propofol 67 (3.6) 121 (3.3) 26 (2.0) 149 (2.1) Paralytic medication, n (%) 304 (55.4) 1791 (48.9) 761 (58	CPAP/BPAP	169 (9.1)	168 (4.6)	63 (4.8)	502 (7.1)
Nasal cannula 142 (7.6) 259 (7.1) 12 (0.9) 228 (3.2) Missing 350 (18.7) 649 (17.7) 947 (72.6) 3987 (56.1) Other 75 (4.0) 194 (5.3) 18 (1.4) 175 (2.5) Video laryngoscopy, n (%) 1238 (66.3) 2635 (71.9) 801 (61.4) 5074 (71.4) Bougie use on first attempt, n (%) 726 (19.8) 203 (15.6) 1189 (16.7) Yes 458 (24.5) 726 (19.8) 203 (15.6) 1189 (16.7) BURP maneuver, n (%) 14 (1.2) 26 (2.0) 79 (1.1) BURP maneuver, n (%) 130 (7.0) 653 (26.3) 274 (21.0) 1863 (26.2) Missing 130 (7.0) 65 (1.8) 39 (3.0) 124 (1.7) Induction medication, n (%) Etomidate 1631 (87.4) 3179 (86.8) 1077 (82.6) 5885 (82.9) Ketamine 152 (8.1) 334 (9.1) 188 (14.4) 1017 (14.3) Midazolam 17 (0.9) 30 (0.8) 13 (1.0) 52 (0.7) Propofol 67 (3.6) 121 (3.3) 26 (2.0) 149	Bag valve mask	167 (8.9)	485 (13.2)	42 (3.2)	396 (5.6)
Missing350 (18.7)649 (17.7)947 (72.6)3987 (56.1)Other75 (4.0)194 (5.3)18 (1.4)175 (2.5)Video laryngoscopy, n (%)1238 (66.3)2635 (71.9)801 (61.4)5074 (71.4)Bougie use on first attempt, n (%)726 (19.8)203 (15.6)1189 (16.7)Yes458 (24.5)726 (19.8)203 (15.6)1189 (16.7)Missing91 (4.9)44 (1.2)26 (2.0)79 (1.1)BURP maneuver, n (%)749 (21.0)1863 (26.2)1863 (26.2)Missing130 (7.0)65 (1.8)39 (3.0)124 (1.7)Induction medication, n (%)152 (8.1)334 (9.1)188 (14.4)1017 (14.3)Ketamine152 (8.1)334 (9.1)188 (14.4)1017 (14.3)Midazolam17 (0.9)30 (0.8)13 (1.0)52 (0.7)Propofol67 (3.6)121 (3.3)26 (2.0)149 (2.1)Paralytic medication, n (%)121 (3.3)26 (2.0)149 (2.1)Rocuronium1034 (55.4)1791 (48.9)761 (58.4)3807 (53.6)Succinylcholine826 (44.2)1869 (51.0)538 (41.3)3279 (46.2)Vecuronium4 (0.2)4 (0.1)4 (0.3)16 (0.2)Missing30 (0.2)0 (0.0)1 (0.1)1 (0.0)	Nasal cannula	142 (7.6)	259 (7.1)	12 (0.9)	228 (3.2)
Other 75 (4.0) 194 (5.3) 18 (1.4) 175 (2.5) Video laryngoscopy, n (%) 1238 (66.3) 2635 (71.9) 801 (61.4) 5074 (71.4) Bougie use on first attempt, n (%) 458 (24.5) 726 (19.8) 203 (15.6) 1189 (16.7) Missing 91 (4.9) 44 (1.2) 26 (2.0) 79 (1.1) BURP maneuver, n (%) 363 (26.3) 274 (21.0) 1863 (26.2) Yes 386 (20.7) 963 (26.3) 274 (21.0) 1863 (26.2) Missing 130 (7.0) 65 (1.8) 39 (3.0) 124 (1.7) Induction medication, n (%) Etomidate 1631 (87.4) 3179 (86.8) 1077 (82.6) 5885 (82.9) Ketamine 152 (8.1) 334 (9.1) 188 (14.4) 1017 (14.3) Midazolam 17 (0.9) 30 (0.8) 13 (1.0) 52 (0.7) Propofol 67 (3.6) 121 (3.3) 26 (2.0) 149 (2.1) Paralytic medication, n (%) 538 (41.3) 3279 (46.2) Kocuronium	Missing	350 (18.7)	649 (17.7)	947 (72.6)	3987 (56.1)
Video laryngoscopy, n (%)1238 (66.3)2635 (71.9)801 (61.4)5074 (71.4)Bougie use on first attempt, n (%)Yes458 (24.5)726 (19.8)203 (15.6)1189 (16.7)Missing91 (4.9)44 (1.2)26 (2.0)79 (1.1)BURP maneuver, n (%)Yes386 (20.7)963 (26.3)274 (21.0)1863 (26.2)Missing130 (7.0)65 (1.8)39 (3.0)124 (1.7)Induction medication, n (%)Etomidate1631 (87.4)3179 (86.8)1077 (82.6)5885 (82.9)Ketamine152 (8.1)334 (9.1)188 (14.4)1017 (14.3)Midazolam17 (0.9)30 (0.8)13 (1.0)52 (0.7)Propofol67 (3.6)121 (3.3)26 (2.0)149 (2.1)Paralytic medication, n (%)Rocuronium1034 (55.4)1791 (48.9)761 (58.4)3807 (53.6)Succinylcholine826 (44.2)1869 (51.0)538 (41.3)3279 (46.2)Vecuronium4 (0.2)4 (0.1)4 (0.3)16 (0.2)Missing3 (0.2)0 (0.0)1 (0.1)1 (0.0)	Other	75 (4.0)	194 (5.3)	18 (1.4)	175 (2.5)
Bougie use on first attempt, n (%) Yes 458 (24.5) 726 (19.8) 203 (15.6) 1189 (16.7) Missing 91 (4.9) 44 (1.2) 26 (2.0) 79 (1.1) BURP maneuver, n (%) Yes 386 (20.7) 963 (26.3) 274 (21.0) 1863 (26.2) Missing 130 (7.0) 65 (1.8) 39 (3.0) 124 (1.7) Induction medication, n (%) Etomidate 1631 (87.4) 3179 (86.8) 1077 (82.6) 5885 (82.9) Ketamine 152 (8.1) 334 (9.1) 188 (14.4) 1017 (14.3) Midazolam 17 (0.9) 30 (0.8) 13 (1.0) 52 (0.7) Propofol 67 (3.6) 121 (3.3) 26 (2.0) 149 (2.1) Paralytic medication, n (%) 3807 (53.6) Succinylcholine 826 (44.2) 1869 (51.0) 538 (41.3) 3279 (46.2) Vecuronium 4(0.2) 4(0.1) 4(0.3) 16 (0.2) Missing	Video laryngoscopy, n (%)	1238 (66.3)	2635 (71.9)	801 (61.4)	5074 (71.4)
Yes 458 (24.5) 726 (19.8) 203 (15.6) 1189 (16.7) Missing 91 (4.9) 44 (1.2) 26 (2.0) 79 (1.1) BURP maneuver, n (%)	Bougie use on first attempt, n (%)				
Missing91 (4.9)44 (1.2)26 (2.0)79 (1.1)BURP maneuver, n (%)Yes386 (20.7)963 (26.3)274 (21.0)1863 (26.2)Missing130 (7.0)65 (1.8)39 (3.0)124 (1.7)Induction medication, n (%)Etomidate1631 (87.4)3179 (86.8)1077 (82.6)5885 (82.9)Ketamine152 (8.1)334 (9.1)188 (14.4)1017 (14.3)Midazolam17 (0.9)30 (0.8)13 (1.0)52 (0.7)Propofol67 (3.6)121 (3.3)26 (2.0)149 (2.1)Paralytic medication, n (%)Rocuronium1034 (55.4)1791 (48.9)761 (58.4)3807 (53.6)Succinylcholine826 (44.2)1869 (51.0)538 (41.3)3279 (46.2)Vecuronium4 (0.2)4 (0.1)4 (0.3)16 (0.2)Missing3 (0.2)0 (0.0)1 (0.1)1 (0.0)	Yes	458 (24.5)	726 (19.8)	203 (15.6)	1189 (16.7)
BURP maneuver, n (%) Yes 386 (20.7) 963 (26.3) 274 (21.0) 1863 (26.2) Missing 130 (7.0) 65 (1.8) 39 (3.0) 124 (1.7) Induction medication, n (%) Etomidate 1631 (87.4) 3179 (86.8) 1077 (82.6) 5885 (82.9) Ketamine 152 (8.1) 334 (9.1) 188 (14.4) 1017 (14.3) Midazolam 17 (0.9) 30 (0.8) 13 (1.0) 52 (0.7) Propofol 67 (3.6) 121 (3.3) 26 (2.0) 149 (2.1) Paralytic medication, n (%) Kocuronium 1034 (55.4) 1791 (48.9) 761 (58.4) 3807 (53.6) Succinylcholine 826 (44.2) 1869 (51.0) 538 (41.3) 3279 (46.2) Vecuronium 4 (0.2) 4 (0.1) 4 (0.3) 16 (0.2) Missing 3 (0.2) 0 (0.0) 1 (0.1) 1 (0.0)	Missing	91 (4.9)	44 (1.2)	26 (2.0)	79 (1.1)
Yes 386 (20.7) 963 (26.3) 274 (21.0) 1863 (26.2) Missing 130 (7.0) 65 (1.8) 39 (3.0) 124 (1.7) Induction medication, n (%) Etomidate 1631 (87.4) 3179 (86.8) 1077 (82.6) 5885 (82.9) Ketamine 152 (8.1) 334 (9.1) 188 (14.4) 1017 (14.3) Midazolam 17 (0.9) 30 (0.8) 13 (1.0) 52 (0.7) Propofol 67 (3.6) 121 (3.3) 26 (2.0) 149 (2.1) Paralytic medication, n (%) Kocuronium 1034 (55.4) 1791 (48.9) 761 (58.4) 3807 (53.6) Succinylcholine 826 (44.2) 1869 (51.0) 538 (41.3) 3279 (46.2) Vecuronium 4 (0.2) 4 (0.1) 4 (0.3) 16 (0.2) Missing 3 (0.2) 0 (0.0) 1 (0.1) 1 (0.0)	BURP maneuver, n (%)				
Missing130 (7.0)65 (1.8)39 (3.0)124 (1.7)Induction medication, n (%)Etomidate1631 (87.4)3179 (86.8)1077 (82.6)5885 (82.9)Ketamine152 (8.1)334 (9.1)188 (14.4)1017 (14.3)Midazolam17 (0.9)30 (0.8)13 (1.0)52 (0.7)Propofol67 (3.6)121 (3.3)26 (2.0)149 (2.1)Paralytic medication, n (%)reducation, n (%)sa807 (53.6)3807 (53.6)Succinylcholine826 (44.2)1869 (51.0)538 (41.3)3279 (46.2)Vecuronium4 (0.2)4 (0.1)4 (0.3)16 (0.2)Missing3 (0.2)0 (0.0)1 (0.1)1 (0.0)	Yes	386 (20.7)	963 (26.3)	274 (21.0)	1863 (26.2)
Induction medication, n (%) 1631 (87.4) 3179 (86.8) 1077 (82.6) 5885 (82.9) Ketamine 152 (8.1) 334 (9.1) 188 (14.4) 1017 (14.3) Midazolam 17 (0.9) 30 (0.8) 13 (1.0) 52 (0.7) Propofol 67 (3.6) 121 (3.3) 26 (2.0) 149 (2.1) Paralytic medication, n (%) Rocuronium 1034 (55.4) 1791 (48.9) 761 (58.4) 3807 (53.6) Succinylcholine 826 (44.2) 1869 (51.0) 538 (41.3) 3279 (46.2) Vecuronium 4 (0.2) 4 (0.1) 4 (0.3) 16 (0.2) Missing 3 (0.2) 0 (0.0) 1 (0.1) 1 (0.0)	Missing	130 (7.0)	65 (1.8)	39 (3.0)	124 (1.7)
Etomidate1631 (87.4)3179 (86.8)1077 (82.6)5885 (82.9)Ketamine152 (8.1)334 (9.1)188 (14.4)1017 (14.3)Midazolam17 (0.9)30 (0.8)13 (1.0)52 (0.7)Propofol67 (3.6)121 (3.3)26 (2.0)149 (2.1)Paralytic medication, n (%)761 (58.4)3807 (53.6)Succinylcholine826 (44.2)1869 (51.0)538 (41.3)3279 (46.2)Vecuronium4 (0.2)4 (0.1)4 (0.3)16 (0.2)Missing3 (0.2)0 (0.0)1 (0.1)1 (0.0)	Induction medication, n (%)				
Ketamine152 (8.1)334 (9.1)188 (14.4)1017 (14.3)Midazolam17 (0.9)30 (0.8)13 (1.0)52 (0.7)Propofol67 (3.6)121 (3.3)26 (2.0)149 (2.1)Paralytic medication, n (%)761 (58.4)3807 (53.6)Succinylcholine826 (44.2)1869 (51.0)538 (41.3)3279 (46.2)Vecuronium4 (0.2)4 (0.1)4 (0.3)16 (0.2)Missing3 (0.2)0 (0.0)1 (0.1)1 (0.0)	Etomidate	1631 (87.4)	3179 (86.8)	1077 (82.6)	5885 (82.9)
Midazolam 17 (0.9) 30 (0.8) 13 (1.0) 52 (0.7) Propofol 67 (3.6) 121 (3.3) 26 (2.0) 149 (2.1) Paralytic medication, n (%) 1034 (55.4) 1791 (48.9) 761 (58.4) 3807 (53.6) Succinylcholine 826 (44.2) 1869 (51.0) 538 (41.3) 3279 (46.2) Vecuronium 4 (0.2) 4 (0.1) 4 (0.3) 16 (0.2) Missing 3 (0.2) 0 (0.0) 1 (0.1) 1 (0.0)	Ketamine	152 (8.1)	334 (9.1)	188 (14.4)	1017 (14.3)
Propofol 67 (3.6) 121 (3.3) 26 (2.0) 149 (2.1) Paralytic medication, n (%) 1034 (55.4) 1791 (48.9) 761 (58.4) 3807 (53.6) Succinylcholine 826 (44.2) 1869 (51.0) 538 (41.3) 3279 (46.2) Vecuronium 4 (0.2) 4 (0.1) 4 (0.3) 16 (0.2) Missing 3 (0.2) 0 (0.0) 1 (0.1) 1 (0.0)	Midazolam	17 (0.9)	30 (0.8)	13 (1.0)	52 (0.7)
Paralytic medication, n (%) 1034 (55.4) 1791 (48.9) 761 (58.4) 3807 (53.6) Succinylcholine 826 (44.2) 1869 (51.0) 538 (41.3) 3279 (46.2) Vecuronium 4 (0.2) 4 (0.1) 4 (0.3) 16 (0.2) Missing 3 (0.2) 0 (0.0) 1 (0.1) 1 (0.0)	Propofol	67 (3.6)	121 (3.3)	26 (2.0)	149 (2.1)
Rocuronium1034 (55.4)1791 (48.9)761 (58.4)3807 (53.6)Succinylcholine826 (44.2)1869 (51.0)538 (41.3)3279 (46.2)Vecuronium4 (0.2)4 (0.1)4 (0.3)16 (0.2)Missing3 (0.2)0 (0.0)1 (0.1)1 (0.0)	Paralytic medication, n (%)				
Succinylcholine 826 (44.2) 1869 (51.0) 538 (41.3) 3279 (46.2) Vecuronium 4 (0.2) 4 (0.1) 4 (0.3) 16 (0.2) Missing 3 (0.2) 0 (0.0) 1 (0.1) 1 (0.0)	Rocuronium	1034 (55.4)	1791 (48.9)	761 (58.4)	3807 (53.6)
Vecuronium 4 (0.2) 4 (0.1) 4 (0.3) 16 (0.2) Missing 3 (0.2) 0 (0.0) 1 (0.1) 1 (0.0)	Succinylcholine	826 (44.2)	1869 (51.0)	538 (41.3)	3279 (46.2)
Missing 3 (0.2) 0 (0.0) 1 (0.1) 1 (0.0)	Vecuronium	4 (0.2)	4 (0.1)	4 (0.3)	16 (0.2)
	Missing	3 (0.2)	0 (0.0)	1 (0.1)	1 (0.0)

Abbreviations: ADA, anatomically difficult airway; BMI, body mass index; BPAP, bilevel positive airway pressure; BURP, backward, upward, rightward, and posterior pressure on the larynx; CPAP, continuous positive airway pressure; PDA, physiologically difficult airway; PGY, postgraduate year.

were not (Figure 2, Supplemental Digital Content, Supplemental Table 4). These results suggest that ADAs and PDAs appear to be associated with intubation sequelae via different mechanisms. Nevertheless, ADAs and PDAs, individually and combined, were adversely associated with first-attempt success without adverse events (Figure 2, Supplemental Digital Content, Supplemental Tables 4 and 5, http://links. lww.com/AA/E699). Furthermore, the combined ADA and PDA group had a lower aOR for firstattempt success without adverse events than either the ADA or PDA groups individually (Figure 2, Supplemental Digital Content, Supplemental Table 4, http://links.lww.com/AA/E699), and the interaction between ADAs and PDAs for first-attempt success without adverse events was found to be less than multiplicative and not different from additive (Supplemental Digital Content, Supplemental Tables 5 and 6, http://links.lww.com/AA/E699). This indicates that ADA and PDA characteristics are likely additive regarding their association with first-attempt success without adverse events, and so neither synergistic nor antagonistic.³² Therefore, in the ED, the risk of difficult intubation and peri-intubation adverse events may be modified by the type of difficult airway (ADA versus PDA) and the combination of both types

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Table 4. Outcomes and Adverse Events

	Difficult airway group			
Variable	Neither	ADA	PDA	Both
n	1867	3664	1304	7103
First-attempt success, n (%)				
Yes	1750 (93.7)	3268 (89.2)	1212 (92.9)	6209 (87.4)
Missing	2 (0.1)	9 (0.2)	1 (0.1)	7 (0.1)
First-attempt success without AE, n (%) ^a				
Yes	1628 (87.2)	3057 (83.4)	1093 (83.8)	5344 (75.2)
Missing	2 (0.1)	9 (0.2)	1 (0.1)	7 (0.1)
Total airway attempts, median [IQR]	1.00 [1.00, 1.00]	1.00 [1.00, 1.00]	1.00 [1.00, 1.00]	1.00 [1.00, 1.00]
Peri-intubation cardiac arrest (on any attempt), n (%)	7 (0.4)	13 (0.4)	19 (1.5)	107 (1.5)
Any first attempt AE, n (%) ^a	144 (7.7)	309 (8.4)	136 (10.4)	1166 (16.4)
First-attempt AEs, n (%)				
Hypotension	52 (2.8)	69 (1.9)	64 (4.9)	332 (4.7)
Bradydysrhythmia	6 (0.3)	10 (0.3)	7 (0.5)	66 (0.9)
Cardiac arrest	7 (0.4)	12 (0.3)	18 (1.4)	93 (1.3)
Hypoxemia	81 (4.3)	205 (5.6)	54 (4.1)	759 (10.7)
Tachydysrhythmia	2 (0.1)	7 (0.2)	2 (0.2)	19 (0.3)
Esophageal intubation—delayed recognition	0 (0.0)	4 (0.1)	0 (0.0)	2 (0.0)
Esophageal intubation—immediate recognition	7 (0.4)	23 (0.6)	5 (0.4)	43 (0.6)
Vomiting	2 (0.1)	22 (0.6)	3 (0.2)	55 (0.8)
Poor glottic view (Grade 3–4), n (%)				
Yes	95 (5.1)	289 (7.9)	74 (5.7)	699 (9.8)
Missing	126 (6.7)	61 (1.7)	31 (2.4)	127 (1.8)
Rescue surgical airway (on any attempt), n (%)	1 (0.1)	3 (0.1)	0 (0.0)	21 (0.3)

Abbreviations: ADA, anatomically difficult airway; AE, adverse events; IQR, interquartile range; PDA, physiologically difficult airway.

^aAdverse events include first-attempt peri-intubation vomiting, esophageal intubation (immediately recognized and delayed recognition), bradydysrhythmia, cardiac arrest, hypoxemia (<90% or drop of 10% of oxygen saturation), hypotension systolic blood pressure <100 mm Hg, and tachydysrhythmia.

(ADA and PDA) (Figure 2, Supplemental Digital Content, Supplemental Tables 4–6, http://links.lww. com/AA/E699).

Our results align with a prior single-site study examining the association between ADAs and PDAs with first-attempt success without adverse events.⁷ In that study, compared to airways with no difficult airway characteristics, ADAs and PDAs had aORs for first-attempt success without adverse events of 0.37 (95% CI, 0.21–0.66) and 0.36 (0.19–0.67), respectively. In addition, they observed the presence of both difficult airway types having a lower adverse association with first-attempt success without adverse events than either individually, aOR 0.19 (0.11–0.33). Differences between our results might reflect slightly different definitions for hypoxemia and hypotension adverse events. The prior study required a decrease in oxygen saturation or blood pressure from preintubation levels.⁷ In contrast, we defined peri-intubation hypoxemia as an oxygen saturation <90% or a decrease of 10% and hypotension as a systolic blood pressure <100 mm Hg (Supplemental Digital Content, Supplemental Table 1, http://links.lww.com/AA/E699). Additionally, the prior study included obesity as only an ADA characteristic; whereas, we included it as both an ADA and PDA characteristic (Table 1).⁷ Nevertheless, despite different definitions for ADAs and PDAs, we observed similar relationships between difficult airway types and first-attempt success without adverse events (Figure 2, Supplemental Digital Content, Supplemental Table 4, http://links.lww. com/AA/E699).

Although our study was intended to be exploratory and informative, it may guide clinical practice in some ways. First, clinicians should anticipate both anatomical and physiological challenges when intubating obese/ morbidly obese ED patients (Supplemental Digital Content, Supplemental Figures 2 and 3, http://links.lww.com/AA/E699).33 Next, PDAs are associated with peri-intubation cardiac arrest (Figure 2, Supplemental Digital Content, Supplemental Table 4, http://links.lww.com/AA/ E699); therefore, clinicians must critically weigh the need for immediate intubation versus optimizing hemodynamic and respiratory parameters.² Also, although ADAs were not directly associated with peri-intubation cardiac arrest in our study, ADAs were associated with multiple airway attempts, which has been associated with peri-intubation cardiac arrest and other severe complications in various other studies.24-26 Lastly, while technological advances such as VL have mitigated anatomical challenges to difficult laryngoscopy and intubation,³⁴ we observed a similar association between ADAs and firstattempt success among both the DL and VL cohorts (Supplemental Digital Content, Supplemental Figure 4, Supplemental Table 4, http://links.lww.com/AA/ E699). Additional work is necessary to better understand the relationship between hemodynamic and respiratory optimization before and during intubation and intubation outcomes.^{2,9,35}

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Figure 2. Density plots of bootstrapped adjusted regression estimates for the primary outcome (first-attempt success) and select secondary outcomes. Each *y*-axis presents probability densities for the *x*-axis variable. In addition to the difficulty airway type (independent variable), model fixed effects included device type (ie, direct and video laryngoscopy), intubator training level (ie, postgraduate training level), trauma, and age as well as the site as a random effect.

LIMITATIONS

First, confounding by indication and unmeasured confounders may have biased the results from our observational data. For example, recognition of and preparation for the difficult airway was not captured in the registry and might impact aspects of care such as intubator selection (ie, trainee versus attending) and interventions intended to mitigate peri-intubation adverse effects (eg, choice of DL versus VL). Similarly, we could not differentiate the cause of postinduction hypoxemia and hypotension. For example, these complications may have been the result of persistent preintubation hypoxemia and hypotension rather than a true adverse effect of the intubation. Also, hindsight and self-report bias may have impacted our results, given that intubating clinicians completed the data forms after the intubation. In addition, many factors may cue an intubator that a particular patient has an ADA or PDA; therefore, a classification with limited criteria will never be entirely sensitive or specific. NEAR

does collect a variable representing the intubator's gestalt impression of airway difficulty; however, this variable may be confounded by knowledge of the intubation outcome. Similarly, the mediation analysis assumes there is no unmeasured confounding between the exposure-outcome, mediator-outcome, and exposure-mediator, as well as no mediatoroutcome confounder that is affected by the exposure.³⁶ And, we did not investigate for the presence of an exposure-mediator interaction. We did not investigate all clinical interventions meant to mitigate ADA or PDA characteristics, such as glucocorticoids for airway edema or hypotension. Similarly, we excluded awake and flexible fiberoptic intubations, since these occur infrequently in NEAR.^{19,37} Intubator-specific skill and experience with ADA and PDA characteristics was unknown and may have affected measured outcomes. Lastly, most intubations were performed by residents in the ED; therefore, the results may not be generalizable to all clinicians and practice settings.

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CONCLUSIONS

Compared to those without difficult airway findings, ADAs alone were adversely associated with firstattempt success, while PDAs alone were not. Both ADAs and PDAs, as well as their additive interaction, were inversely associated with first-attempt success without adverse events.

DISCLOSURES

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