

Airway Management

Jennifer Anderson, MD*, P. Allan Klock Jr, MD

KEYWORDS

- Airway management • Difficult airway management • Videolaryngoscopy
- Supraglottic airway • Airway assessment • Difficult airway algorithm
- Airway equipment

KEY POINTS

- Large database studies have improved our understanding of airway management.
- New guidelines have been published to direct our management of the patient with a difficult airway.
- New airway devices have become commonly available and have improved outcomes but require modification of traditional techniques to maximize success and minimize complications.
- Airway assessment continues to be an imperfect science but should be performed to reduce the risk of patient harm.
- A strategy for airway management that preserves patient oxygenation and ventilation and avoids aspiration throughout the perioperative period should be used for every patient.

INTRODUCTION

The art and science of airway management have advanced considerably during the past 10 years. Airway management tools such as second-generation supraglottic airways (SGAs) and video-assisted devices have become commonly available in the ambulatory setting. These devices have improved patient care and safety, but they have required anesthesia providers to learn new skills and develop new airway strategies. The American Society of Anesthesiologists (ASA) practice guidelines for management of the difficult airway have been updated twice since 1993. The revised guidelines include new airway management techniques and devices and reflect an improved understanding of the science of airway management.¹ Concurrent with these improvements in our technology is the increasing prevalence of obesity and

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Department of Anesthesia and Critical Care, University of Chicago, 5841 South Maryland Avenue, MC-4028, Chicago, IL 60637, USA

* Corresponding author.

E-mail address: janderson@dacc.uchicago.edu

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obstructive sleep apnea (OSA), which have nearly doubled in the United States and substantially increased the number of patients at risk for difficult laryngoscopy, difficult ventilation, or aspiration of gastric contents. Ambulatory surgery patients are presenting with higher body mass indices (BMIs, calculated as weight in kilograms divided by the square of height in meters) and more comorbid conditions for increasingly complex surgical procedures. This constellation of events requires that anesthesia providers are fully capable of recognizing and managing patients with a hazardous airway.

Large database studies and review articles have been published that offer insight into the risk factors for a difficult airway, modes of injury, and clinicians' responses to challenging airway situations.²⁻⁴ More high-risk patients receive care in ambulatory centers, in which providers may not have the luxury of extra personnel skilled in airway management and advanced airway equipment may be limited. Anesthesia providers in ambulatory centers must continue to stay current with airway management tools and techniques to continue to provide the best care for their patients.

To frame the conversation regarding airway management, it is helpful to review the prevalence of airway management difficulty. Relevant data are listed in **Box 1**.

LESSONS LEARNED FROM RECENT STUDIES

Adverse airway events are rare. As a result, it is difficult to conduct studies that have sufficient power to be meaningful. However, as electronic medical records and collaborative research increase, large database studies have been published. In the following section, the salient points of recent large-scale investigations are presented.

The Fourth National Audit Project of the United Kingdom

In 2011, the Royal College of Anesthetists of the United Kingdom and the Difficult Airway Society of the United Kingdom published the results of the Fourth National

Box 1

Prevalence of difficult airway management

- Difficult face mask ventilation occurs at a rate of 1% to 2%
- Impossible face mask ventilation occurs at a rate of 1 to 2 per 1000 anesthetics (0.1%–0.2%)
- The failure rate for the classic and flexible laryngeal mask airway (LMA) is 2%
- The failure rate for the intubating and Proseal LMA is 1%
- Difficult direct laryngoscopy occurs at a rate of 1% to 18% (but most of these patients are successfully intubated)
- Unsuccessful intubation with direct laryngoscopy occurs at a rate of 5 to 35 cases per 10,000 anesthetics
- For patients predicted to have a normal airway, the reported failure rate for videolaryngoscopy-assisted intubation ranges from 0.4% to 2.9%
- For patients predicted to have a difficult to manage airway the failure rate for intubation with videolaryngoscopy is 1.5% to 4.2%
- The cannot ventilate, cannot intubate scenario occurs at a rate of 0.01 to 2 per 10,000 anesthetics
- Difficult mask ventilation significantly increases the risk of difficult intubation by a factor of 4 and impossible intubation by a factor of 12

Data from Refs. 4-12

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