

Design of a Cost-effective Analysis of the Implementation of a Difficult Airway Curriculum

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Introduction

Difficult airway management continues to cause a significant amount of perioperative morbidity and mortality. Since the introduction of the American Society of Anesthesiologists Difficult Airway Algorithm, airway-related adverse outcomes account for 14% of malpractice litigation as noted in the Closed Claims Project.^{1,2} The Closed Claims Project and other quality management reporting agencies (New York Patient Occurrence and Reporting Tracking Systems) evaluate adverse outcomes related to respiratory events like death and anoxic encephalopathy.³ Attempts were made to identify the significant contributory mechanisms to airway-related adverse outcomes such as esophageal intubations, inadequate ventilation and difficult tracheal intubation.⁴ However, there has been little research on the economic impact of airway-related adverse outcomes. This study will evaluate the cost-effectiveness of the introduction of a difficult airway curriculum. Practicing anesthesiologists were provided with an intensive difficult airway management curriculum to develop an individualized difficult airway algorithm, keeping in mind the level of comfort and skill of the practicing anesthesiologist. The economic impact of several outcome measures will be analyzed. This will help to establish the validity and utility of this curriculum.

Method

Attending anesthesiologists at a university healthcare network participated in a difficult airway management curriculum. Outcomes measurements that pertained to direct costs include delayed operating room times, unplanned admissions to the hospital, unplanned admissions to the intensive care unit, case cancellations and length of hospital stay. (Table 1) Indirect costs consisted of patient dissatisfaction, the number of difficult intubations, successfully intubated difficult airways, failed difficult intubations, tracheotomies, and airway traumas. (Table 2) This information will be obtained from the operating room delay records, the anesthesia record, and the departmental quality management database. A comparison will be made to determine if there is a difference between pre- and post-difficult airway curriculum implementation.

Discussion

Airway-related adverse outcomes remain a significant problem with an unknown economic impact. Implementation of an individualized difficult airway may be a means of decreasing cost. Evaluating the cost-effectiveness of decreasing airway-related adverse outcomes may be the objective measure of the success of a difficult airway management curriculum.

References:

1. Practice Guidelines for Management of the Difficult Airway: a report by the American Society of Anesthesiologists Task Force on Management of the Difficult Airway. *Anesthesiology* 1993;78:597-602
2. Practice guidelines for the management of the difficult airway: an updated report by the American Society of Anesthesiologists Task Force on Management of the Difficult Airway. *Anesthesiology* 2003;98:1269-77
3. Lee LA The Closed Claims Project. Has it influenced anesthetic practice and outcome? *Anesthesiology Clinics North America* - 01-SEP-2002; 20(3): 485-501
4. Caplan RA, Posner KL, Ward RJ, Cheney FW. Adverse respiratory events in anesthesia: a closed claims analysis. *Anesthesiology* 1990;72:828-33.

Table 1

Perioperative Airway Adverse Outcomes Direct Costs

Number of Case Cancellations due to Failed Intubations
Number of Case Delays due to Difficult Intubations
Number of pts with Airway Trauma after Intubation
Number of hospital admission due to difficult intubations

Table 2

Perioperative Airway Adverse Outcomes Indirect Costs

Number of Difficult Airways
Number of Failed Intubations in pts with Difficult Airways
Number of Successful Intubations in pts with Difficult Airways
Patient dissatisfaction