A list of the articles used to develop these guidelines is available by writing to the American Society of Anesthesiologists at P.O. Box 902, Park Ridge, Illinois 60068.

B. Assessment of Scientific Evidence and Consultant Opinion

1. Literature Search. A total of 273 articles, published in the interval from 1973 to 1991, were available for consideration. These articles were identified from Medline searches and from the personal files and reference lists of consultants. These articles were reviewed by the consultants to determine the scientific evidence about the management of the difficult airway. A list of the articles used to develop these guidelines is available by writing to the American Society of Anesthesiologists at P.O. Box 902, Park Ridge, Illinois 60068.

2. Proper insertion of the tracheal tube with conventional laryngoscopy requires the operator to achieve an alignment of the angle of the jaw, the angle of the laryngoscope blade, and the direction of the tracheal tube through the larynx. This alignment is more difficult when the tracheal tube is inserted with the laryngoscope blade in one of the instrument's oblique views, when the tracheal tube is inserted with a laryngoscope designed for use in the supraglottic larynx, or when the patient is obese, has a large neck, or is in the Trendelenburg position. Insertion of the tracheal tube through the nasopharynx also makes the proper alignment more difficult.

3. Confirmation of endotracheal intubation facilitates successful management. Confirmatory tests of endotracheal intubation include auscultation of both lungs, inspection of the chest wall for motion, determination of a decrease in the inspiratory volume of the anesthetized patient, and verification of positive pressure mask ventilation in a patient whose SpO2 was >90% before anesthetic induction.

B. Focus

1. A description of the airway difficulties that were encountered. If possible, the description should include (but are not limited to): difficulty with the airway examination, difficulty with mask ventilation, and difficulty with tracheal intubation.

2. A description of the various airway management techniques that were employed. The description should include (but are not limited to): the type of technique, the duration of the technique, and the outcome of the technique.

3. A description of future care. Aspects of documentation that may prove helpful include (but are not limited to): the type of anesthesia, the type of surgery, and the type of airway management.

4. The list of articles used to develop these guidelines is available. The American Society of Anesthesiologists at P.O. Box 902, Park Ridge, Illinois 60068.

5. Proper insertion of the tracheal tube with conventional laryngoscopy requires the operator to achieve an alignment of the angle of the jaw, the angle of the laryngoscope blade, and the direction of the tracheal tube through the larynx. This alignment is more difficult when the tracheal tube is inserted with the laryngoscope blade in one of the instrument's oblique views, when the tracheal tube is inserted with a laryngoscope designed for use in the supraglottic larynx, or when the patient is obese, has a large neck, or is in the Trendelenburg position. Insertion of the tracheal tube through the nasopharynx also makes the proper alignment more difficult.

6. Confirmation of endotracheal intubation facilitates successful management. Confirmatory tests of endotracheal intubation include auscultation of both lungs, inspection of the chest wall for motion, determination of a decrease in the inspiratory volume of the anesthetized patient, and verification of positive pressure mask ventilation in a patient whose SpO2 was >90% before anesthetic induction.

7. Equipment suitable for emergency surgical airway access include: surgical airway, surgical airway using dilator and blade, surgical airway using dilator and tracheostomy set, surgical airway using cricothyrotomy, surgical airway using dilator and esophageal-tracheal combitube, surgical airway using dilator and esophageal-tracheal cuffed catheter, surgical airway using dilator and esophageal-tracheal uncuffed catheter, surgical airway using dilator and esophageal-tracheal balloon catheter, surgical airway using dilator and esophageal-tracheal stent, surgical airway using dilator and esophageal-tracheal prosthesis.

Recommendations: A. Implementation of a protocol for difficult airway management follows. The protocol should be placed under the direct supervision of an anesthesiologist.
I. Evaluation of the Airway

A. Airway examination

1. A comprehensive preoperative examination is recommended with written documentation of findings. The examination should include an evaluation of the neck circumference, presence of a goiter, and the ability to protrude the tongue.

2. Indicators of difficult intubation may include a short neck, goiter, obesity, previous tracheotomy, previous neck surgery, and signs of laryngeal edema.

B. Airway history

1. An airway history should be conducted, whenever feasible, prior to the initiation of anesthetic care in all patients. The history should include information on the presence of acquired, and traumatic disease states.

2. The predictive value of the airway history and its effect on the likelihood of adverse outcomes can be determined by assessing the degree of difficulty with respect to various factors such as anatomical obstacles, patient age, and previous intubation attempts.

C. Radiological imaging

1. Radiological imaging may be helpful in assessing the position of the hyoid bone in relation to the cricoid cartilage, the largest diameter of the trachea, and the diameter of the cricothyroid membrane.

II. A Strategy or Algorithm for the Initial Approach to Intubation

A. Awake intubation

1. Awake intubation is a viable option for patients with a low likelihood of difficult intubation and in patients with compromised respiratory function.

B. Preservation of spontaneous ventilation during intubation attempts

1. Preservation of spontaneous ventilation during intubation attempts is important to prevent the development of hypoxemia.

C. Difficult intubation

1. Difficult intubation is defined as a situation where conventional laryngoscopy does not provide a clear view of the glottis.

2. Difficult intubation may be classified into three categories: primary, secondary, and tertiary.

D. Identification of a preferred approach to intubation

1. The identification of a preferred approach to intubation is necessary to improve the success rate of intubation attempts.

E. Airway history

1. The airway history is an important indicator of the likelihood of difficult intubation.

F. Anesthesiologist’s training and experience

1. The anesthesiologist’s training and experience play a crucial role in determining the success rate of intubation attempts.

G. Anesthesiologist’s familiarity with specific airway

1. The anesthesiologist’s familiarity with specific airway is important to reduce the likelihood of difficult intubation.

H. Use of nonsurgical techniques for the initial approach to intubation

1. Nonsurgical techniques for the initial approach to intubation include awake intubation, laryngeal mask airway, and supraglottic airway.

I. Use of surgical techniques for the initial approach to intubation

1. Surgical techniques for the initial approach to intubation include direct laryngoscopy, Videolaryngoscopy, and tracheotomy.

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