What's New in the 2013 ASA Difficult Airway Guidelines

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Lecture Objectives

- Review of the original guidelines
- Review of the revised guidelines with an emphasis on what has changed
- Discuss how the guidelines apply to the creation of airway management plans in the clinical setting

Background

- In 1993, the ASA created a Difficult Airway Task Force to create guidelines for management of the Difficult Airway
- In 2003 and again on 2013, the task force published updated guidelines based on new evidence as well as new airway devices now available

The Original 1993 Guidelines

- Goals:
  - To facilitate difficult airway management
  - To reduce the likelihood of adverse outcomes

Airway Management an Important Patient Safety Issue….

- APSF Survey 1999 of patient safety issues
- ASA Closed Claims Data:
- Airway events account for 34% of all claims

Stoelting RK.APSF Newsletter 1999; 14:6.
Caplan RA et al. Adverse respiratory events in anesthesia: a closed claims analysis. Anesthesiology 1990;72:828-33.

Role of Guidelines

- To help guide management decisions based on current evidence
- NOT intended as standards of care or requirements
- Guidelines are recommendations

How Were these Guidelines Created?

- 1993 and 2003 Guidelines:
  - ASA Appointed Task Force of 10 Anesthesiologists
  - Derived from consensus, published research and surveys from expert consultants and ASA members
- 2013 Updated Guidelines:
  - Reviewed the literature published since 2002 and new surveys from consultants and ASA members

Why Do We Still Need Guidelines?

- NAP4 Report, published 2011
- 4th National Audit Project in the UK
- Collected airway-related complications in 200 hospitals over a one year period

4th National Audit Project of the Royal College of Anaesthetists and The Difficult Airway Society: Major complications of airway management in the United Kingdom.

The NAP4 Report: Results

- Poor airway assessment and failure to "plan for failure" played a role in poor airway outcomes
- Awake fiberoptic intubation not always performed when indicated
- Multiple repeated attempts during difficult intubations not uncommon
- 60% of emergent cricothyrotomies failed

4th National Audit Project of the Royal College of Anaesthetists and The Difficult Airway Society: Major complications of airway management in the United Kingdom.

The NAP4 Report-Results

- 61% of airway events in the ICU resulted in death or brain damage
- Common themes:
  - Almost 50% of cases obese
  - Large number of events occurred in off hours
  - Lack of capnography, lack of needed equipment
  - Lack of experienced personnel, inadequate training
  - Delayed recognition of high risk patients, lack of back-up plans for management

NAP4 Recommendations

- Always have back up plans and advanced airway equipment
- Use algorithms and guidelines
- Standardize equipment
- Gather additional skilled personnel to help
- Use capnography whenever possible
- Be prepared to treat complications

Cook et al. Airway management outside the operating room: hazardous and incompletely studied. Curr Opin Anesthesiol 2012; 25: 461-9.

The Original 1993 Guidelines

- Recommendations:
  - 1.Perform an airway history and assessment
  - 2. a portable cart with airway equipment should be "readily available"
  - 3.Create a strategy for airway management
  - 4. Create a strategy for extubation of the difficult airway patient

The Original 1993 Guidelines

- Also included:
- Difficult airway definitions in the appendix
- Recommended equipment for a specialized cart
- Recommended techniques for difficult mask ventilation and intubation

What was added/changed in 2003?

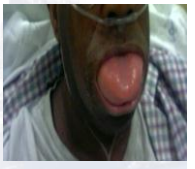
- Biggest change was the addition of the Laryngeal Mask Airway as a rescue ventilation device or conduit for intubation
- Rigid Bronchoscope was also added as an emergency non-invasive ventilation option
- Assessment for difficult tracheostomy added

What's new about the most recent guidelines?

- The term "laryngeal mask airway" was changed to "supraglottic airway"
- Assessment for difficult supraglottic airway placement was added to Step #1
- Video-assisted laryngoscopy as an initial approach to intubation was added to Step #3

Expanded Difficult Airway Definition

- Definition Includes:
- 1. Difficult face mask or SGA ventilation
- 2. Difficult SGA placement
- 3. Difficult laryngoscopy
- 4. Difficult tracheal intubation
- 5. Failed Intubation



2013 Guidelines Step by Step

- Step 1. Evaluation of the Airway
  - History and Physical
  - Assessment for potential difficulty
  - Additional tests if needed (CT, Fluoro)

1. Assess the likelihood and clinical impact of basic management problems:
   - Difficulty with patient cooperation or consent
   - Difficult mask ventilation
   - Difficult supraglottic airway placement
   - Difficult laryngoscopy
   - Difficult intubation
   - Difficult surgical airway access

2013 Guidelines Step by Step

- Next Step: Preparation for Difficult Airway Management:
  - Have the necessary equipment available
  - Informing the patient if difficulty known or suspected
  - Gathering additional personnel to assist
  - Pre-oxygenation and supplemental oxygen delivery during airway management

Recommended Airway Cart Contents

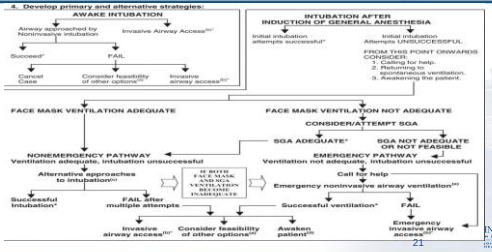
Rigid laryngoscope blades of alternate design and size from those routinely used; this may include a rigid fiberoptic laryngoscope.
Videolaryngoscope.
Tracheal tubes of assorted sizes.
Tracheal tube guides. Examples include (but are not limited to) semirigid stylets, ventilating tube-changer, light wands, and forceps designed to manipulate the distal portion of the tracheal tube.
Supraglottic airways (*e.g.*, LMA or ILMA of assorted sizes for noninvasive airway ventilation/intubation).
Flexible fiberoptic intubation equipment.
Equipment suitable for emergency invasive airway access.
An exhaled carbon dioxide detector.

The items listed in this table represent suggestions. The contents of the portable storage unit should be customized to meet the specific needs, preferences, and skills of the practitioner and healthcare facility.
ILMA = intubating LMA; LMA = laryngeal mask airway.

2013 Guidelines Step by Step

2. Actively pursue opportunities to deliver supplemental oxygen throughout the process of difficult airway management.
3. Consider the relative merits and feasibility of basic management choices:
   - Awake intubation *vs.* intubation after induction of general anesthesia
   - Non-invasive technique *vs.* invasive techniques for the initial approach to intubation
   - Video-assisted laryngoscopy as an initial approach to intubation
   - Preservation *vs.* ablation of spontaneous ventilation

2013 Guidelines Step by Step



Alternate Techniques for Ventilation and Intubation

Techniques for Difficult Intubation	Techniques for Difficult Ventilation
Awake intubation	Intratracheal jet stylet
Blind intubation (oral or nasal)	Invasive airway access
Fiberoptic intubation	Supraglottic airway
Intubating stylet or tube-changer	Oral and nasopharyngeal airways
Supraglottic airway as an intubating conduit	Rigid ventilating bronchoscope
Laryngoscope blades of varying design and size	Two-person mask ventilation
Light wand	
Videolaryngoscope	

This table displays commonly cited techniques. It is not a comprehensive list. The order of presentation is alphabetical and does not imply preference for a given technique or sequence of use. Combinations of techniques may be used. The techniques chosen by the practitioner in a particular case will depend on specific needs, preferences, skills, and clinical constraints.

Role of Videolaryngoscopy

- As an initial approach to intubation
- As an alternate approach after failed direct laryngoscopy
- Also added to list of suggested items to be included on a difficult airway cart



Role of Videolaryngoscopy


- Provides an indirect view of larynx
- Evidence of higher success rates, improved laryngeal view in the difficult airway
- Less neck movement compared to direct laryngoscopy



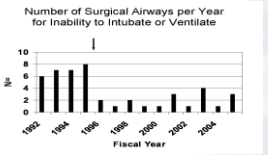

Standardization of Airway Equipment

- ASA Difficult Airway Guidelines 2013
  - **Recommend** "at least one portable storage unit that contains specialized equipment for difficult airway management should be readily available."
- NAP4 Report:
  - "The contents of difficult airway trolleys should be the same throughout the hospital including those used in the ICU and ED"

Practice guidelines for management of the difficult airway: an updated report by the American Society of Anesthesiologists Task Force on Management of the Difficult Airway. Anesthesiology 2013; 118: 251-70.
Woodall et al. Can we make airway management (even) safer?- lessons from national audit. Anaesthesia 2011;66 (Suppl. 2): 27-33

Standardization

- Standardized equipment, carts, and personnel can improve outcomes



Berkow et al. Need for emergency surgical airway reduced by a comprehensive difficult airway program. Anesth Analg 2009; 109:1860-9.

Recommended Extubation Strategies

- Create a preformulated strategy
- Consider merits of awake versus deep extubation
- Consider factors that may affect ventilation post-extubation
- Consider use of a device as a bridge to extubation

Extubation-just as critical as intubation!

- **Asai et al 1998**:-reviewed respiratory complications associated with intubation and extubation: highest incidence after extubation (12.6%)
- **ASA closed claims data**: 12% of claims associated with extubation, esophageal and tracheal injuries more common with difficult intubation

Asai et al. Respiratory complications associated with tracheal intubation and extubation. Br J Anaesth 1889; 80: 767-75.
Domino et al. Airway injury during anesthesia: a closed claims analysis. Anesthesiology 1999; 91:1703-11.

Why is Extubation potentially hazardous?

- Reduced airway reflexes
  - Residual neuromuscular blockade
  - Obstructive sleep apnea -Opioid administration
- Airway Edema
  - Surgical causes Positioning
  - Difficult intubation Fluid overload
- Laryngospasm
  - Triggered by secretions/blood/debris
  - Can lead to post-obstructive pulmonary edema

Difficult Airway Society Guidelines for the management of tracheal extubation. Anaesthesia 2012;67: 318-40.
Domino et al. Airway injury during anesthesia: a closed claims analysis. Anesthesiology 1999; 91:1703-11.

Why is Extubation potentially hazardous?

- Human factors
  - Availability of equipment
  - Fatigue
  - Time pressure
  - Less availability of skilled personnel to assist
  - Distractions
    - Broom et al: higher noise levels, more unrelated conversations, staff exits during emergence

Glavin RJ. Excellence in anesthesiology: the role of non-technical skills. Anesthesiology 2009;110:201-3.
Broom et al. Critical phase distractions in anaesthesia and the sterile cockpit concept. Anaesthesia 2011;66: 175-9.

Options for Bridging Extubation

- **Supraglottic Airway Devices**
  - **Placed before or after removal of endotracheal tube**
- **Airway Exchange Catheters**
  - **Placed through in situ endotracheal tube**
  - **Left in place after extubation in a monitored setting until airway no longer at risk**

Airway Exchange Catheters for Extubation

- Placed prior to extubation through tube
- Allows ventilation and oxygenation via catheter
- Can be used as a guide for re-intubation
- Left in place post-operatively in a monitored setting until airway no longer at risk
- Well tolerated, patients able to phonate and cough

Mort TM. Continuous airway access for the difficult extubation: the efficacy of the airway exchange catheter. Anesth Analg 2007;105: 1357-62.

Difficult Airway Society Guidelines for Extubation

- Step 1: make an extubation plan
  - Is extubation low risk or high risk?
  - High risk:
    - Are there pre-existing airway difficulties?
    - Has the airway changed since induction?
    - Is airway access restricted?
- Step 2: prepare and select algorithm
  - Optimize patient and gather equipment/personnel needed
  - Select low risk vs. high risk algorithm

Difficult Airway Society Guidelines for the management of tracheal extubation. Anaesthesia 2012;67: 318-40.

Difficult Airway Society Guidelines for Extubation

- Step 3:
  - Extubation using chosen algorithm:
    - Low risk: routine deep or awake extubation
    - High risk: consider:
      - Supraglottic airway exchange
      - Remifentanil infusion to prevent airway irritation
      - Extubation over an airway exchange catheter
      - Postponing extubation if unsafe to remove tube
- Step 4:
  - Post-extubation care in the ICU/PACU

Recommendations for Follow-Up Care

- **1. Documentation of difficult airway management in the medical record**
  - **Difficulties encountered**
  - **Techniques used**
- **2. Informing patient and family about the airway difficulty and potential complications**
- **3. Registration in a medical registry such as MedicAlert**

Algorithm Take Home Points

- **First step: assess patient for:**
  - **Difficult ventilation**
  - **Difficult intubation**
  - **Difficult supraglottic airway placement**
  - **Difficult surgical airway access**
- **Have multiple intubation plans-AND be prepared to implement them**
- **Supraglottic Airways play an important role-as both a rescue airway and an intubation conduit**

Algorithm Take Home Points

- If difficulty suspected, consider awake intubation
- Consider videolaryngoscopy as an alternative initial approach as well as a rescue technique
- Extubation of the difficult airway also important

What Are Your Airway Resources?

- Do you have an airway cart?
- If you need a surgical airway, who do you call?
- How long will it take for additional resources to arrive?
- Do you have resources to manage an intubated patient in the PACU?

Airway Considerations in the Ambulatory Setting

- What type of center do you work in?
  - Are alternate airway devices immediately available?
  - Is additional back-up, including personnel to perform a surgical airway, immediately available?
  - Are there resources to manage failed extubation of the difficult airway patient?

If the answer to any of the previous questions is NO…

- Consider if known or suspected difficult airway patients should be moved to another setting
- Pre-screening of patients may help identify patients not appropriate for your center

Role of Simulation

- Simulation of rare events has been proven to be useful
- Clarifies provider roles in an emergency
- Can identify resource needs and limitations:
  - Time needed to obtain additional personnel and equipment
  - Is needed equipment immediately available?
- Allows for immediate debriefing
- Opportunity to learn and practice airway devices on mannequin models
- Can be used for team training and communication skills
- Providers learn from experience

Summary

- Remember these are guidelines, not standards of care
- Have alternative airway devices available AND know how to use them
- Anticipate and plan for difficulty
- Also anticipate and plan for difficulty with extubation
- Follow-up care with the patient and documentation of difficulty also important