

Assessment Before Airway Management



Paul Baker, MBChB, MD, FANZCA

KEYWORDS

- Airway management • Assessment • Techniques • Laryngoscopy • Airway
- Intubation • Tracheal

KEY POINTS

- The techniques and measurements used to predict airway management difficulty are inaccurate. Bedside tests, such as the modified Mallampati test, thyromental distance measurement, sternomental distance measurement and mouth opening, lack accuracy as stand-alone tests to predict difficult tracheal intubation.
- Combining bedside tests and examining multiple physical features improves the chances of predicting a difficult airway but not enough to perform as reliable predictive tests.
- Several studies have examined risk factors associated with airway management techniques and patient factors. This information can be useful when planning to manage a patient's airway.
- It is wise to plan for the unexpected difficult airway: only 50% of difficult airways are anticipated preoperatively.

INTRODUCTION

“An anaesthetist must assess the patient before anaesthesia and devise an appropriate plan of anaesthetic management” – The Good Anaesthetist, Royal College of Anaesthetists 2010.¹

Airway assessment includes taking a history, performing a physical examination, reviewing the clinical records and performing additional tests. Based on the information gleaned from the airway assessment, a strategy should emerge to cope with each aspect of the patient's airway. This strategy should include options to postpone the case or manage the patient's airway awake and should provide backup plans to deal with failure. Successful identification of physical features that are suggestive of a difficult airway should direct planning toward safe airway management. Accordingly,

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Department of Anaesthesiology, University of Auckland, Level 12, Room 081, Auckland Support Building 599, Park Road, Grafton, Private Bag 92019, Auckland 1142, New Zealand

E-mail address: paul@airwayskills.co.nz

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many national airway guidelines emphasize the importance of a thorough and skilled assessment of all patients undergoing anesthesia.^{2–4}

Since the original case series describing physical features associated with difficult direct laryngoscopy and difficult tracheal intubation (DTI),⁵ several upper airway diagnostic screening tests have been proposed.⁶ The latest recommendations from the Canadian Airway Focus Group (CAFG) promote airway assessment at multiple levels, including not only tracheal intubation but also bag mask ventilation, supraglottic airway ventilation, and percutaneous emergency airway access. **Boxes 1–5** have been reproduced from that group and include bedside airway tests and risk factors for airway difficulty.³

Many of the airway tests were specifically designed to identify patients without obvious airway pathology or abnormal anatomy who might be harboring a difficult airway. Most of the airway tests can be performed at the bedside in seconds.

Bedside airway tests have been criticized for their poor predictive capability as seen in **Table 1**. This poor predictive capability relates to the low incidence of airway difficulty. In this situation, the positive and negative predictive values will always be low for any test unless their sensitivities and specificities approach 100% (**Fig. 1**).⁴⁰

Other reasons for the poor test performances include a lack of standardized methodology, ill-defined end points, and reliance on subjective assessment, thereby decreasing reproducibility. Most of the tests show only fair interobserver reliability.⁴⁹ Predictive tests have also been criticized for relating their findings to the sample from which the study was derived rather than validating the test from a separate population.¹⁴ Subsequent validation studies often find inferior predictive value.⁵⁰ Several recent studies have focused on improving the predictive value of airway examination by improving test methodology or combining tests into composite scores.

DEFINITIONS AND INCIDENCE OF AIRWAY DIFFICULTY

One of the problems of finding reliable predictors of a difficult airway concerns a failure to standardize definitions of airway difficulty.⁵¹ Variations in definitions create problems when trying to compare studies of complications and risk factors. A current list of definitions can be found in the CAFG special article, including definitions for

Box 1

Predictors of difficult direct laryngoscopy^{7–22}

- Limited mouth opening
- Limited mandibular protrusion
- Narrow dental arch
- Decreased thyromental distance
- Modified Mallampati class 3 or 4
- Decreased submandibular compliance
- Decreased sternomental distance
- Limited head and upper neck extension
- Increased neck circumference

From Law AJ, Broemling N, Cooper RM, et al. The difficult airway with recommendations for management—part 2—the anticipated difficult airway. Can J Anaesth 2013;60:1119–38; with permission.

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