Difficult Airway Society 2015 guidelines for the management of unanticipated difficult intubation in adults: not just another algorithm

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Since the first iteration of the ASA Difficult Airway Practice Guidelines for the management of the difficult airway was published in 1993 (updated in 2013),1 a number of national societies have generated practice guidelines for difficult airway management, including the Difficult Airway Society (DAS).2

Unlike the ASA guidelines, which address both the anticipated and the unanticipated difficult airway, the DAS guidelines focus on the unanticipated difficult airway, an unpredictable problem. The new 2015 DAS guidelines differ from the original 2004 DAS guidelines in that they are more concise and more pragmatic, with considerable emphasis placed on preparedness and accountability of the practitioner by optimizing conditions and minimizing patient morbidity in a difficult airway situation. Training of physicians with alternative airway devices and techniques, including emergency invasive airway access, is not only considered essential but expected.

Practice guidelines rely on scientific literature to supply evidence in support of clinical recommendations. Evaluation of literature includes identifying whether the topic addressed is relevant and determining whether the methodology used has resulted in the minimization of potential bias in findings. Numerous sources of bias may occur during the development of a guideline, including article selection bias, reviewer bias, reporting bias, bias associated with study design, and subjective weighting or grading of studies.3 Steps to mitigate bias should be a vital part of an evidence-based process.4-6

Difficult airway literature generally focuses on airway management devices and techniques. Airway management techniques...
often use a protocol or algorithm that includes a combination of choices that depend on the patient’s condition at some point during a procedure.\textsuperscript{1, 2} The use of algorithms can be studied, but from these studies one cannot determine the impact of the individual components of the algorithm; these must be assessed individually with an appropriate research design, preferably a randomized controlled trial.

Devices to manage the difficult airway are varied, but most have the intent of quickly establishing a patent airway. An appropriate airway device should provide adequate ventilation and oxygenation while causing minimal airway morbidity and keeping the risk of aspiration to a minimum. Several factors should be taken into consideration when determining which type of airway device should be used in any given situation, including, but not limited to, patient anatomy, clinical situation, provider skill level, and equipment availability.

The introduction of new airway devices into clinical practice accounted for the most significant changes in the ASA Difficult Airway Practice Guidelines throughout the past two decades. From 1993 to 2003, it was the introduction of the laryngeal mask airway, and from 2003 to 2013, it was the introduction of the video laryngoscope. Both of these devices have also been incorporated into the new DAS guidelines for good reason, because randomized controlled trials have been successfully conducted on patients with a history of difficult intubation, and intubation success with these patients has been appropriately assessed.

After an unsuccessful initial intubation attempt, restoration of ventilation is the priority, by either a non-invasive (i.e., supraglottic airway [SGA]) or an invasive intervention, or by awakening the patient. Repeated attempts at intubation should not delay non-invasive airway ventilation (i.e., SGA) or emergency invasive airway access. The new DAS guidelines favour the use of second-generation SGAs in this situation, because they have specifically designed features to reduce the risk of aspiration and provide a better airway seal. The Fourth National Audit Project study revealed that 56% of the airway complications involved the use of an SGA and that these devices were often used inappropriately.\textsuperscript{7}

Numerous aspiration events occurred when a first-generation SGA was used in patients with clearly identifiable risk factors for aspiration.\textsuperscript{8} Although these events were not as evident in the use of the second-generation devices, second-generation devices were used less commonly at the time (10% of SGA use). Nonetheless, recommendations were made to use second-generation SGA’s rather than first-generation devices, because they are considered to provide better airway protection.

Conclusive evidence demonstrating better safety of one device compared with another regarding aspiration can only come from formal studies of several million patients, because harmful aspiration events occur infrequently. These studies may be impractical. Thus, safety data must be acquired by analysing the design features of airway devices, appropriate bench models, and surrogate measures of airway safety, such as seal pressures and laryngeal view.

Although all second-generation SGAs have features designed to lessen the likelihood of gastric insufflation, regurgitation, and aspiration, currently there is little or no scientific evidence to support their performance in improving such outcomes for difficult airway patients. Of the second-generation devices currently available, only the i-gel, the Proseal LMA, and the LMA Supreme have large-scale longitudinal studies in adults that support their use. There is little robust evidence to inform the practitioner of the safety and efficacy of each SGA or which device to use in a given situation.

Given that repeated instrumentation of the airway may lead to airway trauma and deterioration of the ability to ventilate, the number of laryngoscopy attempts with any particular device should be limited. In attempts to secure the airway, there is no single technique that is better than others in all situations. Practitioners involved in airway management should be familiar with several different devices and techniques, because if a difficult airway problem develops, it should be managed expeditiously and safely. Each device has unique properties that may be advantageous in certain situations, yet limiting in others.

For other difficult airway interventions, controlled studies with difficult airway subjects are not easy to conduct, primarily because of the emergent nature of difficult airway patency. In these situations, studies must rely on surrogate outcome measures or non-difficult airway patients to serve as subjects for controlled clinical trials. Successful intubation must be inferred rather than genuinely observed. Although these studies are indirect assessments, they can nonetheless be valuable for identification of a difficult airway before a procedure.

The increasing demands for evidence-based medicine encourage us to determine the effectiveness of new approaches and how they compare with traditional techniques. For video-assisted laryngoscopy (VAL), the standard of care is traditional direct laryngoscopy. Thus far, there is insufficient evidence to indicate that VAL should replace direct laryngoscopy in patients with normal or difficult airways.\textsuperscript{9, 10} Nonetheless, as more video laryngoscopes are introduced into clinical practice and as more practitioners become increasingly skilled with the technique of VAL, it could well become the standard for both routine and difficult intubations.

Similar to recommendations by other national societies, the new DAS guidelines incorporate the use of VAL for management of the difficult airway. Multiple reports have demonstrated improved glottic visualization and visual confirmation of tube placement, in addition to better team coordination during airway management with VAL. These devices should not only be immediately available, but the practitioner should become proficient in their use.\textsuperscript{11, 12}

The use of cricoid pressure (CP) in difficult intubation has not been extensively studied. Although the new DAS guidelines recommend the use of CP during rapid sequence induction, the application of CP during rapid sequence induction remains a matter of debate; some believe in its effectiveness in preventing pulmonary aspiration, whereas others believe it should be abandoned because of the paucity of scientific evidence of benefit and possible complications.\textsuperscript{13, 14} The literature does demonstrate that the use of CP is likely to make airway interventions, such as mask ventilation, SGA insertion, direct laryngoscopy, and intubation more difficult.\textsuperscript{15, 16}

As a result of the lack of sufficient scientific evidence that CP reduces regurgitation, in addition to evidence that it may interfere with airway management, the Scandinavian practice guidelines leave its use up to individual judgement rather than making its use mandatory.\textsuperscript{17} The use of CP has been removed as a level I recommendation in both the 2010 American Heart Association Guidelines\textsuperscript{18} and the Eastern Society for the Surgery of Trauma (EAST) practice management guideline for emergency tracheal intubation.\textsuperscript{19} Despite these trends, the use of CP remains in the new DAS guidelines. Nonetheless, the guidelines recommend that if initial attempts at laryngoscopy are difficult with the application of CP, it should be released under vision with suction available; it should be re-applied if regurgitation occurs. It should remain off during insertion of an SGA.

Although controlled scientific research in the management of the unanticipated difficult airway is sparse, the new DAS
guidelines provide valuable consensus from an expert panel that has drawn extensively on the experience of international experts. They are successful in their aim to provide a structured approach to a potentially life-threatening clinical situation and take into account current practice and recent developments. The authors note that these guidelines should not constitute a minimum standard of practice, nor be regarded as a substitute for good clinical judgement. They also acknowledge that the guideline recommendations may not be suitable in all circumstances; separate guidelines exist for paediatric and obstetric patients and for extubation.

Most importantly, the new DAS guidelines emphasize that in order to be most effective, our profession must address the impact of environmental, technical, psychological, and physiological factors on our performance. We must also consider human factor issues at individual, team, and organizational levels to optimize these guidelines. At both individual and societal levels, we have the responsibility to provide optimal patient care. Although there is not enough scientific literature to support every recommendation made concerning airway management in these guidelines, we must provide guidance based on the best available evidence we have, including expert consensus.

Difficult airway guidelines must be updated continuously to reflect the most current evidence and should be reviewed regularly for their content and continued relevance. There has been a tremendous growth in the literature on the management of the difficult airway in anaesthesia practice. The new DAS guidelines are not just another algorithm but rather an evolutionary advancement in how to address management of the unanticipated difficult airway in adults. The burden is now upon us to implement the guidelines in the most appropriate manner to maximize the safety of our patients.

Declaration of interest
None declared.

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