



REVIEW

Airway Management Academy: A global initiative to increase patient safety during airway management by medical education



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S U M M A R Y

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Airway management is the core competence of an anesthesiologist. Complications in airway management can result in severe disability or death. As airway management techniques are rapidly changing there is a need for structured innovative training. In this review we will describe why we think that modern airway management education may be the way to move forward. We will discuss the problems and controversies during airway management, we will describe the characteristics of adult learning and we will show how we have integrated these factors in the Airway Management Academy, a non-profit global teaching institute to improve patient safety.

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“Everyone realizes the importance of clinical material, curriculum, administration, research, physical facilities and other integral parts of the medical school. But after all, what good are these if teaching is so technically bad that it fails and the student does not learn”
Lawrence B Slobody, professor of Pediatrics, 1950.¹

1. Introduction

Airway management can be described as medical treatments and techniques required to ensure oxygenation of the body, keep the airway open and prevent the lungs from aspiration. Complications during airway management can lead to severe morbidity and mortality. Without oxygenation all body functions cease in short time. The difficult airway can be defined as a clinical situation in which a conventionally trained anesthesiologist experiences difficulty with face mask ventilation of the upper airway, difficulty with tracheal intubation, or both.²

In the last decade medical societies and the World Health Organization have realized that the (unrecognized) difficult airway is a risk factor for complications during surgery or emergency medical care.

Airway management techniques can be divided into basic and advanced. Basic techniques include bag mask ventilation, supraglottic airway device placement and tracheal intubation with

direct laryngoscopy. More advanced airway management techniques are awake flexible optical intubation, videolaryngoscopy with hyperangulated blades or invasive treatments as a surgical airway.

Major complications of airway management are death, brain damage, emergency surgical airway (tracheotomy) and unanticipated intensive care unit admission.^{2–4} In addition, problems and complications with airway management devices such as tracheal tubes or supraglottic airway devices (SAD), turn out to occur relatively frequently.^{4,5} Hagberg et al. published a review of the most common complications during airway management.⁶ Hypoxia because of these complications is a main reason for morbidity and mortality. Severe complications may arise if the oxygen delivery to the brain is interrupted for only three minutes. Emergency airway management is a highly complex task because there is extreme time pressure, teamwork and good communication are of paramount importance and human factors as situational awareness and fatigue may play an important role.

With the development of newer videolaryngoscopes, disposable flexible optical intubation devices, second and third generation SAD, ultrasound use for airway management, novel drugs and new airway rescue techniques the treatment choice is enormous, but can also lead frequently to confusion for the clinician.

In this review we will describe why we think that modern airway management education may be the way to move forward. We will discuss the problems and controversies during airway management, we will describe the characteristics of adult learning and we will show how we have integrated these factors in the Airway Management Academy.

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2. Common problems during airway management crisis

From the medical literature, clinical experience and medical teaching and simulation courses we can summarize common problems that may be encountered during airway management, and especially during emergency situations.

Failed recognition of the difficult airway, no leadership, decision to perform a surgical airway made too late, lack of knowledge or skills, communication problems, time pressure because of severe desaturation, no call for (expert) help, blind attempts to intubate, loss of situational awareness, no plan B or alternative airway management plan, underestimation of severity of the situation, unknown environment and equipment, no wake up plan, wrong tracheotomy technique, intubation without muscle relaxant, anatomical problems or just bad luck.^{2–10}

3. Current controversies in airway management

Not only problems can be encountered during airway management, in recent years controversies have arisen on topics that seemed straightforward.¹¹ There is discussion if rapid sequence induction has to be performed with cricoid pressure or not, difficult airway guidelines are not very helpful and not specific enough and there is no clear evidence that airway guidelines lead to a better patient outcome. Currently there is not much proof that newer devices are much better, complications still occur. The best technique to perform an emergency surgical airway is unclear and frequently fails when performed by anesthesiologists, the gold standard awake flexible intubation for the anticipated difficult airway is not good enough since it has a failure rate from 0.5% to 13%. Anesthesiologists have difficulty recognizing the Cormack en Lehane score during intubation,¹² a scoring system which always seemed straightforward and easy to document the difficulty grade of exposing the glottis.

Glossary box

Airway management

Airway management can be described as medical treatments and techniques required to ensure oxygenation of the body, keep the airway open and prevent the lungs from aspiration.

Situational awareness

Situational awareness can be described as the perception of environmental elements within a volume of time and space, the comprehension of their meaning, and the projection of their status in the near future.

Personalized airway management

The concept of PAM can be defined as the most ideal airway management for your patient, at your hospital, with your team, with your experience, with your equipment for that specific procedure within your budget.

SAMT

Simulation based Airway Management Training.

Outstanding question

Will better education lead to improvement in patient safety.

Will medical simulation lead to better long term outcome?

4. Training and education

Training and education has traditionally focused on the preparation and delivery of intraoperative anesthesia. Operating room anesthesia is increasingly safe but an extended role of the anesthesiologist has emerged and is gaining momentum internationally. Anesthesiologists as perioperative physicians are now delivering clinical leadership to improve outcomes for high-risk surgical patients from admission to discharge. What is less clear is how the young professional will train for this new role.

Airway management has a central role in many clinical settings and can be considered the core skill and competence of an anesthesiologist. Despite this extended anesthetic practice, educational opportunities and efforts have been slower to evolve. Another issue is that changes in airway management have gone so fast that most anesthesiologists are no longer capable of keeping up with all these changes. Some airway management societies or special airway management interest groups are trying to spread their knowledge via workshops, conferences and articles in leading journals. However, that is often not very structured and it is possible to gain accreditation or obtain a degree in teaching just by paying the course fee.

It is time now to develop innovative curricula and define professional standards. Educational institutions have an opportunity to develop innovative learning through continuing professional development and higher degree postgraduate programs. It is clear that anesthesiologists must embrace and understand high quality education to effect better outcomes for patients in the perioperative period.

5. Adult learning

Adult learning has specific characteristics. Adult education is a practice in which adults engage in systematic and sustained learning activities in order to gain new forms of knowledge, skills or values.^{13,14} Educating adults (medical professionals) differs from educating children in several ways. An important difference is that adults have already accumulated knowledge and work experience which can add to their learning experience.^{14–16} Another difference is that most adult education is voluntary, therefore, the participants are generally self-motivated. For airway management we have noticed that many students tell us that the main reason to come to the courses is a feeling of fear because they have seen or were involved in a “cannot intubate cannot oxygenate” situation or they feel the necessity to train better because the technical developments in the field are going too fast. There is not much guidance from the medical companies or professional medical societies. Many novel airway management devices and equipment come to the market nowadays with only limited or even without clinical evidence or trials. Some doctors tell us that they were involved in a difficult airway case with dramatic end. Although severe complications are rare, all clinicians will treat patients with difficult airways during their careers. Furthermore adults apply their knowledge in a practical fashion to learn effectively. They must have a reasonable expectation that the knowledge they gain will indeed help them further their goals.

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