



Contents lists available at ScienceDirect

Trends in Anaesthesia and Critical Care

journal homepage: www.elsevier.com/locate/tacc

EDITORIAL

The ghosts from the past prevent research on airway management



When I was a boy I loved spending my summer vacation at my grandparents' chalet, up in the Swiss Alps. It's an old building, constructed by my grandfather in the traditional wooden style, heated by fire only and surrounded by an old, vast larch wood forest. A wooden fence around the property would prevent the cows from entering, and a wanderer to the next alp had to open the gates to continue their way on the small footpath. While the gates were closed during daytime, every night my grandfather would open them. By doing so, the ghosts that came down the path from the glacier at nighttime would be able to pass by the house unhindered. Beware if you forgot to open the gates; the ghosts would hunt you in your dreams and wake you up at night, my grandfather told me. At the time, I didn't dare take the risk of not opening the gates at night. And yes, I always slept very well in the chalet, thank you.

Whilst following old traditions to satisfy wandering ghosts may be charming in the Swiss Alps, it is inappropriate behavior in medicine. Yet, because of the lack of evidence, this is exactly what we do in airway management. We follow old traditions without proper evidence.

Applying cricoid pressure (Sellick's maneuver) in rapid sequence induction (RSI) intubation is an excellent example of an old ghost we don't dare challenge. If anything, research so far has only left us confused in regard of whether it is beneficial or not. This is no surprise, because there simply hasn't been a trial conducted that would answer the question: Does applying cricoid pressure prevent gastric aspiration? No one has risked closing the gates at night. We prefer sleeping well, but in ignorance, at night.

Ask any anesthesiologist what they consider the biggest current threat in airway management and you will likely hear "pulmonary aspiration" amongst the top five complaints. And this is a fair statement. According to the NAP4 report,¹ aspiration accounted for 17% of all airway problems and 50% of anesthesia deaths, hereby being the leading cause of anesthesia-related death. What a powerful ghost! To be "on the safe side", we apply cricoid pressure in RSI. We let patients fast for six hours without solid food in elective cases, although gastric emptying is extremely variable and the risk of pulmonary aspiration may depend at least as much on the anesthesiologist than on gastric content.²

Evidently, we haven't done enough in recent decades to prevent pulmonary aspiration. Because the actual event is rare, it is very difficult to study. And where evidence is lacking, we rely on "eminence-based medicine". However, as Cook and colleagues demonstrated nicely in 2011, so-called "expert opinion" might differ considerably when it comes to airway management, sometimes actually leading to opposing views.³ This is no surprise, as these experts have to rely on the same weak evidence available besides their own experience. Herein lies the other problem about

airway management: The *best way* differs. It depends on the patient, the surgical setting, and especially on the experience of the treating anesthesiologist. According to NAP4, poor planning of airway strategies and poor clinical judgment were major factors that led to airway disaster. These human factors, although well appreciated, have been scarcely evaluated so far. We are but beginning to understand their influence in airway management. An excellent start is a preliminary report by Flin et al.⁴ Taking the reports evaluated by NAP4, the authors identified detrimental factors such as situation awareness, staffing, time pressure, and stress. Perhaps equally important, several protective factors, such as teamwork and communication, were found. The data presented is too scarce to draw any conclusions. We need data that covers a wide variety of hospitals, countries, and anesthesiologists. What are the contributing and preventive factors in your hospital? Have you done your own NAP4 within your institution? If we really want to understand what causes failure in airway management, we need much, much more data. Because this is well above the scope of any single institution or even a single anesthesia society, we finally need better cooperation amongst the many societies, and we need projects that really answer the important questions. I want to read research articles that prospectively randomize thousands of patients. The questions are not new: What is the evidence about cricoid pressure? Who needs prolonged fasting and for how long? What is the best positioning in RSI? Do patients at risk of pulmonary aspiration profit from pre-induction gastric catheters? Do the use of a gastric access and the choice of a specific supraglottic airway device help prevent pulmonary aspiration?

RSI and pulmonary aspiration are by far not the only areas in which we practice airway management without evidence. When emergency cricothyroidotomy performed by anesthesiologists is associated with a success rate of only 36%,¹ then it is important to know how we can improve this success rate. How can we improve teaching airway management providers and implement the knowledge in everyday practice? What are the roles of checklists and guidelines? What are the roles of interpersonal skills and human factors? These questions will not be answered in a short and easy study. Unfortunately, current academic requirements encourage single institutional research with quick output instead of multicenter studies spanning several years. Five years ago, an article in the "Lancet" stated 85% of all resources were wasted.⁵ How much research is wasted in our specialty?

The biggest challenge for both research and clinical work in the next decade will be to move away from device-focused solutions for airway problems towards anesthesiologist-focused solutions. Recently, the anesthesiologist has been shown to influence outcome in cardiac anesthesia. This does not come as a surprise

to any of us, as the accompanying editorial by Steven Shafer pointed out.⁶ What holds true for cardiac anesthesia will certainly prove correct in airway management as well. Further research in airway management has to focus on what educative interventions improve the human factors and clinical skills of anesthesiologists. We need to make the craftsman better, not his tools.

This is not going to happen as long as we stick to traditions instead of truly daring to find new solutions. The ghosts from old should not prevent us from gaining the evidence necessary to improve our specialty.

What happened to the ghosts in the Swiss Alps? My grandparents are long gone, but the house still stands. Instead of the wooden fence and small footpath, there is now a wide gravel road that passes the house at some distance. There is no need to open gates at nighttime anymore and the ghosts are free to roam the streets at night. So far, none have complained.

Conflicts of interest

None to declare.

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