Airway management in critical care — new guidelines, old problems

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Intensive care training in the UK is undergoing change. Traditionally, the majority of intensive care medicine (ICM) clinicians were from an anaesthetic background with trainees and consultants receiving specific training and experience in basic and advanced airway management. As ICM becomes a stand-alone specialty with intake of trainees from other acute medical backgrounds, these airway skills can no longer be taken for granted. Advanced ICM trainees require only six months of training in anaesthesia, which could mean that the management of the difficult airway from intubation through to successful extubation will become increasingly challenging for those without advanced airway skills.

The recent Royal College of Anaesthetists NAP4 audit aimed to identify and study major complications of airway management in the UK. It described many of these events as likely to have been avoidable, with a disproportionately high number of adverse airway incidents occurring in the intensive care unit (ICU) and emergency department. When compared with ‘anaesthetic’ airway incidents, ICU airway events were more likely to be managed by doctors with less airway experience, occur out of hours and lead to more frequent permanent harm and death. Similar findings are echoed in the report written on behalf of the UK National Patient Safety Agency. Both of these reports highlight an increased risk of airway-related incidents occurring in the obese patient and during patient movement (for physiotherapy, nursing care, invasive procedures and radiological investigations), and that preparation of the patient, environment and equipment is often inadequate. Of note, NAP4 recommends algorithms for the management of extubation and re-intubation, and provides a suggested checklist for intubation and documentation of back-up plans for at-risk airways.

We will all experience a serious airway problem during our career, and the themes described above are usually evident, especially in the ICU. Contrast a healthy, anaesthetised, day case patient moved onto the theatre table with four assistants including an anaesthetist holding onto the airway device, with two nurses rolling a critically hypoxic patient in the ICU. Similarly, how many times has the successfully managed patient with a difficult airway been admitted to the ICU for a few days, just long enough for the successful management strategy to become forgotten in an emergency or lost in handover? Harm has resulted from a lack of basic understanding of airway anatomy and procedures, including confusion with tracheostomies and laryngectomies. Bedhead signs and airway alert forms are as applicable in the ICU as they are in the anaesthetic room or wards of our hospitals.

The case report by Simpson and Duffy in this issue of JICS highlights how our critically ill patients are at increased risk of airway complications. Tim Cook reminds us in his commentary that there is little point merely stocking airway equipment if we don’t know what it does, what its limitations are and how to use it safely. We should ensure that all medical and nursing staff covering our units (including consultants) are familiar with the ever-changing airway equipment that is available. With the increasing availability of portable high fidelity simulation, it is possible to devise airway scenarios that play out on the ICU in real time, using the airway equipment and team members that would manage a critical incident. The availability of a dedicated difficult airway trolley, fibreoptic endoscope, algorithms and practice in emergency airway access techniques has also been encouraged. It may be appropriate to modify current guidelines and courses to make them ICU and out-of-theatre specific.

Intubation has long been considered a potentially unstable period for a critically ill patient and many international guidelines for the management of difficult intubation are available. The recognition that extubation can be equally fraught has prompted the UK Difficult Airway Society to publish guidelines for the management of tracheal extubation. It promotes the concept of having an ‘extubation strategy’, involving pre-procedure planning and preparation, and post-procedure monitoring and care. Almost all patients extubated on ICU could be considered at risk of developing complications. There is often no guarantee that the airway will be easily managed after several days of intubation, and the altered cardio-respiratory physiology of the critically ill mandates that airway management needs to be timely and decisive. Although primarily aimed at peri-operative extubation, these guidelines are applicable to critical care patients with similar techniques and equipment advocated when managing high-risk extubations, requiring familiarity, training and experience.

Preventable patient harm has been well described in patients with tracheostomies in critical care and beyond, with familiar causes. In response, the Intensive Care Society (ICS) has recently collaborated with and subsequently endorsed work by the National Tracheostomy Safety Project. This multidisciplinary initiative has produced emergency algorithms, along with educational resources for all staff managing ‘neck breathing’ patients, available from www.tracheostomy.org.uk.

End-tidal CO₂ monitoring is mandatory during anaesthesia. In a recent survey, only a third of all ICUs in the UK always used it for intubation, and only a quarter always use it for continuous monitoring. Again, as NAP4 highlighted, correct
use and interpretation of the capnography trace is essential. This is particularly pertinent in critical care where a single bedside capnography device can frequently be attached either to a breathing circuit used for resuscitation or to the ventilator circuit, causing confusion in an emergency when swapping between the two circuits. The ICS recommends waveform capnography monitoring for all intubations performed on critically ill patients, and others recommend continuous waveform capnography in those receiving ventilation via any artificial airway.\textsuperscript{12,14}

The ICS is attempting to further understand the root cause of airway incidents occurring in critical care and should be applauded for examining this area in detail.\textsuperscript{3} This comprehensive information should allow us to determine rates of airway complications and to focus our attention on prevention, including challenges to industry to develop better, safer airway equipment and devices. There also is a clear challenge to individual units and intensivists from all backgrounds to ensure that we understand our airways and know how to manage an emergency using equipment, procedures and guidelines that all of our staff are familiar with.

References


JICS mission statement

The purpose of JICS is to represent the breadth and depth of the specialty in the UK and beyond. It should be a platform not only for publishing original work but also for describing and discussing current trends and developments, for raising issues of topical concern and for expressing the broader church of opinion relating to current practice. It should be inclusive and involve all those from the full spectrum of the specialty, whether clinical, basic science, audit, education, medico-legal or ethics. This encompasses not just medical, but nursing and all allied professionals (NAHP) working in critical care, reflecting the multidisciplinary nature of our specialty. It should be interesting to read and should encompass the best aspects of both tabloid and broadsheet.

Just as the starting positions of the Lancet, BMJ and JAMA were focused on providing platforms for the dissemination of medical knowledge, so is JICS; but as Wakely suggested of the Lancet, it should entertain, instruct and reform: ‘an arched window to let in the light or… a sharp surgical instrument to cut out the dross.’ The New England Journal of Medicine started by ‘documenting’ the first demonstration of ether, ‘describing’ clinical entities and ‘reporting’ medical successes. So, in essence, to borrow sentiments from eminent predecessors, the purpose of this journal should be to achieve a position where ‘all health professionals involved in critical care should find something of interest.’