to add a few points to the ongoing discussion on the safe use of propofol in the ED.

First, while sedation in the ED for painful procedures is undoubtedly an essential part of front-line medicine, the emergency patient population is extremely heterogeneous by definition and the use of a standardized propofol dosing scheme is potentially unsafe. The varying combinations of previous analgesia, co-morbidities, trauma, and extremes of age with a fixed bolus dose of propofol can rapidly convert an episode of sedation to a general anaesthetic (GA) without a protected airway.

The difficult to define grey areas of ‘conscious sedation’, ‘deep sedation’, and exactly where the transition to GA occurs depend on the practitioner, their experience, and the expectations of the support staff. Propofol is an anaesthetic drug when used in all but the smallest of doses and we feel that patients receiving it should be assessed as for a GA, with particular attention to aspiration risk and airway assessment along with competency in advanced airway management.

With regard to fasting times, it is well known that patients who have sustained a trauma or have received opiates have greatly reduced gastric emptying and if being considered for a GA would likely undergo rapid sequence induction. The risk of rendering a patient with uncertain stomach contents unconscious must be carefully weighed against the benefits of avoiding the operating theatre.

Finally, it is reassuring to see the introduction of end-tidal CO₂ monitoring into this group’s protocols. We feel that even though it is not required by the UK or Australasian colleges for ‘sedation’, this commonly available monitor can be the single most useful adjunct for early detection of apnoea in a setting outside of the operating theatre. A number of the described sentinel events relating to extended hypoxia may have been easily prevented by end-tidal CO₂ monitoring and a more tailored dose of anaesthetic agent.

As with most indistinct areas of practice, there is somewhat of an ‘art’ to successful and safe sedation and skill comes only with experience. Perhaps ED trainees aiming to practice sedation could be encouraged to spend more time with their anaesthetic colleagues in settings such as elective endoscopy lists in order to gain more of a feel for this difficult technique.

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Tracheostomy care: it is not just about the training

Editor—Dr Taylor and colleagues 1 correctly highlight that problems continue around the management of tracheostomies and that increasingly, troubleshooting and emergency management of this vulnerable group is falling on to anaesthetists and intensivists. There are a number of reasons for this, currently being examined by the NCEPOD tracheostomy care study. First, there has been a shift in the patient characteristics who are receiving a tracheostomy, with the majority of procedures now percutaneously performed in our critical care units for weaning rather than the surgical tracheostomies performed as part of head and neck procedures. Secondly, there is a reduction in the quantity and quality of out-of-hours medical cover in most ward settings, with specialist head and neck trainees often based off-site or covering multiple geographical locations. Unexpected emergency department attendances or ward emergencies are often managed by the resident airway experts—anaesthesia and critical trainees. As Dr Taylor points out, there is no guarantee among our own trainees that they will have been taught or be experienced or confident enough to manage these uncomfortable situations, which may involve time-critical, decisive airway management. Thirdly, our hospital infrastructures often lead to suboptimal management of tracheostomy patients with care delivered by untrained nursing staff, unfamiliar with the principles of tracheostomy care, working in clinical locations which lack basic and emergency airway-specific resuscitation equipment, managed by clinical teams who often lack tracheostomy expertise.

In the North West of England during 2006, we uncovered the same issues around training and confidence as Dr Taylor highlights, with final year anaesthetic and critical care trainees describing themselves as inadequately trained and experienced to confidently manage tracheostomy emergencies. We developed multidisciplinary training courses in our region and delivered these to 379 staff over the following 2 yr (21% anaesthetists, 30% ICU, 16% ENT and MaxFax, 10% community-based, 4% medical, 2% emergency medicine, 17% others). Pre-course quizzes revealed that the majority of non-ENT clinical staff did not recognize or appreciate the critical difference between a tracheostomy and a laryngectomy. The recognized importance of multidisciplinary expertise and management led to the initiation of the National Tracheostomy Safety Project, with multidisciplinary emergency guidelines backed by key stakeholders, published in 2012.2 Our resources are supported by a dedicated website (www.tracheostomy.org.uk), a video library, Smartphone applications, e-learning resources developed with the DoH’s e-Learning for Healthcare, and a comprehensive, free manual. Our courses have been delivered in the UK and beyond and full and half-day courses are now available through the international Advanced Life Support Group (www.alsg.org). Local training of multidisciplinary clinical staff has been well received with the many courses since 2006 evaluated as ‘excellent’ (65%) or ‘very good’ (34%). We hope that by improving multidisciplinary routine care and standardizing the approach to emergency
care that we can improve the quality and safety of care provided, as highlighted by Dr Taylor.

The solution to these complex problems is not just in educating our own trainees however, but examining the environments, locations, and resources supporting staff in our clinical settings. There is often expertise in allied health professionals or specialist ward-based nursing staff that can be utilized and the concept of a truly multidisciplinary approach has been advocated and applied successfully by some. Re-organization of our wards to create safe locations to manage neck-breathers with trained nursing staff, agreed (and trained) medical cover, resourced with adequate equipment has recently been shown to reduce the nature, severity, and rates of tracheostomy-related critical incidents. This ‘joined-up’ approach has been adopted by the new Global Tracheostomy Collaborative (www.globaltrach.org) which will launch in the UK and Europe in July 2014. The patient safety impact of proven multidisciplinary quality improvements, supported by educational resources, can be tracked and benchmarked using a bespoke database. It is anticipated that approaches such as this will reduce the burden of avoidable institutional harm in this vulnerable group of patients.

**Declaration of interest**

B.A.M. is the Medical Lead of the UK National Tracheostomy Safety Project and the UK & European Lead of the (not for profit) Global Tracheostomy Collaborative. No relevant financial interests to declare.

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**Haemodialysis before emergency surgery in a patient treated with dabigatran**

Editor—I read with interest the article by Esnault and colleagues stating that they used a blood flow rate of 500 ml h$^{-1}$ and dialysate flow of 1000 ml h$^{-1}$; however, these values are implausible—it seems likely that they used 1000 ml min$^{-1}$ dialysate flow (using online dialysis water supply) and 500 ml min$^{-1}$ blood flow rate (although that is impressive for a femoral catheter). Furthermore, dabigatran, which is lipophilic, has a large and variable apparent volume of distribution during the terminal phase, ranging from 167 to 1860 litres, as a consequence, significant rebound in plasma concentration can occur after dialysis and immediate post-dialysis levels or clotting parameters may not be an accurate indicator of complete reversal of anti-coagulation. Finally, I note that, in this case, dabigatran levels had already decreased from 123 to 50 ng ml$^{-1}$ (below the therapeutic level) before dialysis, presumably due to renal clearance. High-dose acute haemodialysis is not without risk and will be complex to arrange outside of a renal unit. Haemodialysis should probably be reserved for patients with severe renal dysfunction, extremely high anticoagulant levels, or life-threatening need for anti-coagulation reversal within hours. If haemodialysis is used, clinicians should be aware of the potential for rebound in plasma concentration after therapy.

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