block contributes to successful tracheal intubation. In our study, 92% of patients received a neuromuscular blocker and fewer than 1% required more than two attempts at tracheal intubation. There is a clear link between multiple attempts at intubation and development of complications, some of which are life-threatening. In a study of 2833 intubations in critically ill patients, neuromuscular block was used in only 20% of intubations, and in 17% only topical anaesthesia or nothing was used. One in 10 patients required more than two attempts at tracheal intubation; complications were significantly more common in this group: hypoxaemia (70% vs 11.8%), oesophageal intubation (51% vs <5%), cardiac arrest (11% vs 0.7%), regurgitation (22% vs 1.9%), and aspiration of gastric contents (13% vs 0.8%). In 3423 out-of-theatre intubations, neuromuscular block was used in 63% of the 144 patients who developed significant complications compared with 73% of those who did not; multiple attempts at intubation and poor laryngoscopic views were more common in patients not given a neuromuscular blocker (>2 attempts at intubation 16% vs 2%; C&L grade 3 or 4 20% vs 8.7%). A further study found attending physicians were more likely to use neuromuscular block, with fewer resulting complications, than junior doctors. The NAP4 project which reported major complications of airway management found that failed intubation, difficult or delayed intubation, and ‘can’t intubate, can’t ventilate’ accounted for 39% of all events, and 53% of events which occurred in the intensive care unit (ICU). In that report, several events in the ICU and the emergency department were managed by doctors who would not be expected to have airway expertise; indeed, ‘education and training’ was considered a causal or contributory factor in 58% of ICU cases. In summary, we believe that unsupervised junior trainees with little airway expertise should not be the first responders for airway management in the critically ill patient, and that when used by doctors with airway expertise, neuromuscular blockers contribute to fewer multiple attempts at tracheal intubation and fewer life-threatening complications.

Declaration of interest

D.C.R. and D.W.M. have assisted Aircraft Medical in the development of the McGrath videolaryngoscope. The employing authority of the authors (NHS Lothian) has received payment from Aircraft Medical for professional advice given by D.C.R. and D.W.M. on a consultative basis.

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Epidural blood patch is the gold standard treatment for dural puncture headache

Editor—We read with interest the correspondence in two recent issues of the BJA relating to patients with known dural punctures. In the first report, the patient had a dural puncture with an 18 G Tuohy needle and developed a headache later that day, but did not receive a blood patch until day 11 post-puncture and remained in hospital until day 19. A cerebral magnetic resonance imaging was performed on day 7 due to concerns over worsening neurology (bilateral subdural haematoma and diffuse meningeal swelling consistent with intracerebral hypotension) and repeated on day 17, by which time she had developed a cortical vein thrombosis. The second patient, received a combined spinal–epidural, developed a dural puncture headache and received an epidural blood patch shortly afterwards, although the exact time is not mentioned. The headache resolved and the patient was discharged home 2 days later. She presented again 4 weeks later with a dural puncture headache and psychiatric symptoms and intracranial hypotension confirmed on computed tomography. She underwent a lumbar puncture, confirming a low cerebrospinal fluid pressure but was not offered a repeat blood patch. She was discharged home 17 days later.

In UK practice, blood patches are recommended as the gold standard for treatment of dural puncture headaches. Our usual practice would be to offer a blood patch to a patient with a known dural puncture and symptoms of a low-pressure headache, normally on the day after the dural puncture. If symptoms remain, a repeat patch would be offered, usually 24 h later.

In the first case, the patient developed a subdural bleed secondary to meningeal traction. If a blood patch had been performed 24 h post-puncture, it may have led to a complete resolution of symptoms and may have prevented the excessive dural stretch leading to this bleed. Prevention of ongoing meningeal stretch may also have prevented the thrombosis formation. When the patient finally received a...
blood patch on day 11, all her symptoms resolved. It is not clear why the blood patch was not performed earlier.

Similarly, in the second case, a blood patch caused resolution of all neurological symptoms initially. On return of similar problems, albeit complicated by the psychiatric disturbance, the authors performed a lumbar puncture. Lumbar punctures are reported to cause dural puncture headaches in at least 32% of non-obstetric patients. A repeat blood patch on this day might have resolved all of the symptoms.

Both cases are sad situations where a new mother is unable or incapable of looking after her baby as a direct result of an anaesthetic intervention. A blood patch performed earlier might have allowed these families to return home sooner, care for and bond sooner with their babies, and settle quicker into normal family life.

Do both of these cases illustrate differences in the management of patients with known dural punctures between the UK and other parts of the EU? More prompt epidural blood patching may prevent other more serious complications—it is interesting to consider what might underlie these differences in approach.

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Why is there such a discrepancy between evidence and clinical practice in terms of PDPH treatment? To find answers, we searched for specific guidelines by national societies of anaesthesiology in Europe. The homepage of the Association of Anaesthetists in Great Britain and Ireland states: ‘If symptoms persist after 24–48 h or the headache is disabling consider an epidural blood patch’ In contrast, the Austrian Association indicates no specific treatment. Similarly, the Italian and Swiss Association have no statement on PDPH. The German Association refers to the website of the Scientific Board of Medical Societies in Germany which dictates that with PDPH, an epidural blood patch should be performed, but no time frame is given. No data are available for these European countries which do not have a specific guideline for PDPH, but we suspect that only few epidural blood patches are performed and within reasonable time. A retrospective single-centre study (n=17 198) from Belgium reported that 56% of obstetric patients with an accidental dural puncture developed PDPH and 82% received an epidural blood patch 68±31 h after perforation.

A study assessing current practice throughout Europe is warranted. Awareness for potential complications of PDPH and the percentage of women receiving a timely epidural blood patch should be raised.

**Declaration of interest**

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**Reply from the authors**

Editor—We appreciate the interest of Dr Marr and colleagues in our report. We agree with them that a timely epidural blood patch within 24 h of developing post-dural puncture headache (PDPH) is the gold standard. Unfortunately, many clinicians seem reluctant to perform this procedure and thereby expose the patient to serious discomfort and needless risk of serious complications.