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Earlier studies of prolonged times to tracheal extubation after end of surgery

To the Editor:

Arora and colleagues examined time to extubation after thoracic aortic surgery.[1] In their very interesting study, they found negligible differences in median times to extubation between normothermic patients (7 minutes [95% confidence interval (CI) 6-to-8 minutes]) versus hypothermic patients (8 minutes [95% confidence interval 7-to-12 minutes]).[1] There were significantly greater incidences of prolonged times to extubation among hypothermic patients (hazard ratio 2.06 [95% confidence interval 1.18-to-3.59]).[1] The authors' study of hypothermia and prolonged extubation is novel because earlier studies involved prolonged extubations being caused by drugs with slower wakeup[2–4] or anesthesia providers (nurse anesthetists and resident physicians) who had little prior experience (<5 cases) working with the surgeon.[5] The authors' finding of negligible difference in median times to extubation but large difference in incidences of prolonged times to extubation matched a two-group comparison of patients undergoing long gynecologic procedures.[4] There was prolonged extubation among 39% (292/740) of patients who did not receive remifentanil or desflurane versus 6% (35/632) among those who did (relative risk 7.12 [95% confidence interval 5.10, 9.95]), but the mean difference was only 1 minute.[4]

Arora and colleagues explained that "although there are no established limits that clearly define normal time to extubation, prolonged times to extubation that are greater than 15 minutes can significantly reduce operating room workflow, with other team members sitting idle waiting for extubation," referencing Bayman and colleagues' study which showed, instead, that prolonged operative times to extubation were not a useful metric for comparing the performance of individual anesthesia providers or anesthesiologists.[6] The study of operating room workflow described by Arora and colleagues[1] was done by Masursky and colleagues.[7] There was a positive association between time to extubation and the probability of at least one person being idle in the operating room.[7]

There are more data showing the validity of using 15 minutes as criterion for prolonged time to extubation. Among many hospital patients, approximately 15% of extubations were prolonged based on 15 minutes.[2,7] Patients with prolonged extubations (≥15 minutes) were rated by the anesthesiologists as having poor recovery from anesthesia.[8] Extubation times longer than 15 minutes were also associated with immediate reintubation and with respiratory treatments in the post anesthesia care unit.[9] Times to extubation ≥15 minutes were associated with longer times from patient transport from the operating room to the start of the surgeon's next case.[2] Finally, when controlling for surgical time and prone positioning,[6] prolonged extubations were associated with 13-minute longer times from end of surgery to operating room exit.[10]

Declaration of Interest

The Division of Management Consulting of the University of Iowa's Department of Anesthesia provides consultations to corporations, hospitals, and individuals. I receive no funds personally other than my salary and allowable expense reimbursements from the University of Iowa, and have tenure with no incentive program. My family and I have no financial holdings in any company related to my work, other than indirectly through mutual funds for retirement. Income from the Division's consulting work including those related to the economics of time to extubation are used to fund Division research. A list of all the Division's consults is available in my posted curriculum vitae at https://FranklinDexter.net/Contact_Info.htm.

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Airway Management for Tracheal Resections – Comments on a Controversial Approach

To the Editor:

I have read with great interest the article by Defosse et al.[1] As the authors emphasized, the number of tracheal resections is relatively modest and diverse practices described in the literature lack guidance from large conclusive trials.[2] Nevertheless, studies with a few cases can provide valuable information for clinicians. The new approach in the author's study was the retrograde surgical insertion of airway exchange catheters (AECs) for high-frequency jet ventilation (HFJV), which seems to be somewhat complicated and may be risky. AECs are intended for an endotracheal tube insertion or change and are not designed for intraoperative HFJV. Instead, commercially available HFJV catheters that are thinner than AECs and have an established safety record can be employed. HFJV catheters would certainly not obstruct the surgical view and do not require extra manipulation for the insertion. Some AECs are very rigid; the Cook Airway Exchange Catheter, Extra-Firm with Soft Tip, size 14F (Cook, Bloomington, IN) used by the authors is not the softest in the market. Retrograde insertion of these catheters resulted in the proximal catheter ends emerging from either through the laryngeal mask airway or in the mouth. This observation indicated that the retrograde insertion was blind, and the surgeon could not control where the catheters went. The authors did not report any catheter-related complications, but this finding may have been due to the small sample size. Blindly inserting a relatively rigid catheter into the pharynx may be associated with naso- or oropharyngeal injuries similar to a nasogastric tube.[3]

Conflict of Interest

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Hyponatremia, Liver Transplantation and Tromethamine Availability

To the Editor:

We read, with interest, Verbeek et al recent review of the perioperative implications and management of hyponatremia in liver transplant recipients .[1] We share their concerns with the inevitable sodium load associated with administration of sodium bicarbonate when used for management of metabolic acidosis during the transplant. Tromethamine was advocated for treatment of metabolic acidosis in the presence of severe hyponatremia, but its availability is limited.[2,3] In early 2018, the manufacturing company Hospira advised the Food and Drug Administration that the production of tromethamine had been discontinued and was unrelated to the drug's safety or efficacy.[4] Liver transplant anesthesiologists worked with hospital pharmacy partners to locate a supply of tromethamine, which is also used as a component of commercial organ preservative solutions. Our pharmacy secured smaller volumes of tromethamine from a compounding pharmacy (Central Admixture Pharmacy Services), which has multiple locations across the United States, including one in Houston, Texas (Fig 1). The original source of tromethamine was a 500- mL glass bottle, which facilitated the large volumes often required during liver transplantation based on proportional correction of acidosis. The current supply is in 50- mL syringes, necessitating nuanced and partial correction along with other strategies as summarized by Verbeek.[1] Given the potentially devastating complications of rising plasma sodium during a liver transplant, tromethamine is an essential tool for anesthesiologists in the severely hyponatremic patient. Preparation of tromethamine by compounding pharmacies may allow limited access to the drug for use in liver transplantation.

Conflicts of Interest

None.

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