head in the neutral position, all MC tubes would be safely above the carina, whereas 42 of 50 of the nasal RAE tubes would sit below the carina. With the head in the flexed position, 2 of 50 of the MC tubes and all of the CNR tube tips would be below the carina. Whereas with TP guided ETT depth, all intubations with both MC and CNR in the neutral and flexed position would lead to the ETT tip safely above the carina.

In light of these findings, Wang and Zuo's comments lead to several important considerations regarding insertion depth of cuffed ETTs. First, the TP method works very well with MC tubes, likely the most commonly used cuffed ETT in children, when the head is in the neutral and flexed positions. It also reiterates the anesthesiologist's need for vigilance, as it is likely that no single technique will suffice for every clinical circumstance, notably with the use of CNR tubes. In the case where known ETT tip movement will occur, we need to ensure that appropriate care and caution are taken to minimize patient risk. It may be that repeating the TP technique after final head positioning may help ensure patient safety, but this assertion requires further study. Finally, these comments highlight our discipline's need for an improved CNR tube design, perhaps similar to the MC tubes.

Ethics approval

The original study was approved by the University of Saskatchewan's College of Medicine Research Ethics Committee (Project: Med -12-66, May 28/2012), and this response does not need the separate approval by the IRB.

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Conflicts of interest

No conflicts of interest declared.

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Harm attributable to research distraction? Challenging conclusions on caudal epinephrine

Sir—I read with interest the case report by Dr. August *et al.* regarding the unintentional epidural injection of epinephrine (1). I commend the authors for this interesting report, though I must disagree with one of their conclusions.

First, they concluded that the hemodynamic effects of a large dose of epidural epinephrine are similar to the more routine dosage. However, the hemodynamic effects they report must be interpreted cautiously. Older bioimpedance-based devices lose reliability in the face of changes in peripheral vascular resistance (2), and data on newer bioimpedance-based devices such as the ICON are still building. Thus, in the setting of epinephrine

overdose, the picture may become muddied. In addition, if the afterload increased leading to pulmonary edema, this would further worsen the reliability of bioimpedance-based devices (2). Given the (hopefully) singular nature of this case and the lack of other data to corroborate the findings of the ICON device, we must view the results in this case cautiously.

Of greater importance to readers would be an exploration and root cause analysis of this syringe swap, which is altogether too common. An additional critical question must be posed: Did the presence of the research device and researchers directly contribute to this error by distracting the anesthesia team? Distraction has been long known to be a major cause of anesthesia adverse events, and the problem of frequent interruption remains unabated. Distractions during critical drug preparation and administration occur with alarming frequency, approximately twice per case (3). Although this child did not have any immediate ill effect from this syringe swap, had the swap been for a syringe of greater epinephrine concentration, the outcomes may have been markedly different. Such doses of epinephrine have been associated with profound hypokalemia and rhabdomyolysis (4), or tachydysrhythmias, pulmonary edema, and cardiac arrest. The potential harm to this patient and other patients from distraction provided by the research device and researchers must be appropriately accounted for.

Ultimately, our primary commitment is to our patients for safe care, and as such, this report of an adverse event should describe how the authors sought to reduce these hazards, if briefly. The conclusion that this device was '. . .practical and clinically useful' (1) would clearly not be the case if the distraction it posed caused this adverse event, at least in part. Given the 15 month delay in publication since the event, I look forward to hearing more about the root cause analysis of this event and what changes were actually implemented, rather than what the authors merely proposed. While research studies have long been known to improve attentiveness through additional assessments of the patient, or simply through a version of the Hawthorne effect, the shift in focus of attention resulting from research protocols has not been identified as a source of distraction in the anesthesia (5) or other literature. As such, the risk of harm attributable to research distraction (HARD) should be recognized.

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Conflicts of interest

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