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## Correspondence

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### *Airway anesthesia: the toothpaste method*

To the Editor:

I enjoyed the description by Chung *et al.* of a simple technique for achieving topical anesthesia of the airway.<sup>1</sup> I have, for many years, used a variation of the technique that Chung *et al.* have examined in detail and identified it as the "toothpaste method". Rather than the liquid lidocaine preparation which Chung *et al.* instill on the base of the tongue, I employ lidocaine 5% ointment. This has the advantage that it does not require transfer to an intermediary administration device.

As early as possible, I ask that the patient stick out his/her tongue as far as possible. I explain that I am going to put "a line of toothpaste down the middle of your tongue". I then instruct the patient to oppose the tongue to the roof of the mouth and hold it there as long as possible while the lidocaine ointment "melts". I do this with the patient supine. During the time taken to achieve intravenous access, transport the patient to the operating room and apply monitors, I usually administer a second line of toothpaste.

Five or more minutes after the initial administration, the patient may begin to cough, and is why I begin to apply the second line of toothpaste. I now believe that the cough represents the ointment reaching the carina or lower portions of the airway rather than being an indication of incomplete anesthesia of the glottis.

I discourage trainees in anesthesia from using more invasive injection techniques and have resisted suggestions to supplement the toothpaste technique with those same blocks.

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#### Reference

- 1 Chung DC, Mainland P-A, Kong AS. Anesthesia of the airway by aspiration of lidocaine. *Can J Anesth* 1999; 46: 215-9.

#### REPLY:

Thank you for the opportunity to comment on "Airway anesthesia: the toothpaste method".<sup>1</sup> To anesthetize the airway below the glottis in our aspiration technique,<sup>2</sup> we

used tongue traction to discourage swallowing and to promote aspiration of the lidocaine solution. It is unclear why the patient does not simply swallow the lidocaine ointment in the toothpaste method described by Dr. Drummond. Although he has observed anesthesia at and below the glottis, there remains doubt of the quality of anesthesia. It deserves a formal and comparative study.

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#### References

- 1 Drummond JC. Airway anesthesia: the toothpaste method. *Can J Anesth* 2000; 47: 94.
- 2 Chung DC, Mainland P-A, Kong AS. Anesthesia of the airway by aspiration of lidocaine. *Can J Anesth* 1999; 46: 215-9.

### *Models for difficult laryngoscopy*

To the Editor:

Naguib *et al.*, further elucidated the relationship of airway measures with the risk of difficult intubation.<sup>1</sup> Their clinical model, however, may not be applicable for use in clinical practice.

First, "all known" clinical risk criteria were not included in the analysis. For example, atlanto-occipital extension was not included as a predictor measure - only head and neck movement was included as part of the Wilson risk sum score, which is unreliable. Other important measures may have altered their model, such as that described by Bellhouse *et al.*<sup>2</sup> All potentially important variables should be assessed to ensure that the prediction model is reliable and valid.

Second, their models were developed on only 25 patients who were difficult to intubate. Up to ten clinical measures were included in their multivariable analysis: for every predictor variable, there were only 2.5 patients with difficult intubation. However, to ensure that multivariable models do not suffer from over-fitting, where they perform well only on the sample from which they were derived, the outcome: variable ratio should be greater than 5:1.<sup>3</sup>

Therefore, the model is most likely over-fitted and may not be applicable to other populations. There are at least two methods of validation to determine if the

model suffers from over-fitting: internal validation such as bootstrapping, and external validation on a new group of patients.<sup>4,5</sup> The authors did not validate their model. Their statement that the model's high ROC area implies reproducibility is false: in this setting, ROC area simply measures the accuracy of the model when it is reapplied to the sample population; it has no relation to reproducibility or external validity.<sup>6</sup>

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#### References

- 1 Naguib M, Malabarey T, AlSatli RA, Damegh SA, Samarkandi AH. Predictive models for difficult laryngoscopy and intubation. A clinical, radiologic and three-dimensional computer imaging study. *Can J Anesth* 1999; 46: 748–59.
- 2 Bellhouse CP, Doré C. Criteria of estimating likelihood of difficulty of endotracheal intubation with the Macintosh laryngoscope. *Anaesth Intensive Care* 1988; 16: 329–37.
- 3 Harrell FE Jr, Lee KL, Mark DB. Multivariable prognostic models: issues in developing models, evaluating assumptions and adequacy, and measuring and reducing error. *Stat Med* 1996; 15: 361–87.
- 4 Wasson JH, Sox HC, Neff RK, Goldman L. Clinical prediction rules. Applications and methodological standards. *N Engl J Med* 1985; 313: 793–9.
- 5 Laupacis A, Sekar N, Stiell IG. Clinical prediction rules. A review and suggested modifications of methodological standards. *JAMA* 1997; 277: 488–94.
- 6 Feinstein AR. Multiple logistic regression. In: Feinstein AR (Ed.). *Multivariable Analysis: An Introduction*. New Haven: Yale University Press, 1996: 297–330.

#### REPLY:

We appreciate Dr. Karkouti's interest in our study.<sup>1</sup> Dr Karkouti did not provide any evidence to support his contention that "our clinical model may not be applicable for use in clinical practice."

We suspect that the head and neck movement (as part of the Wilson risk sum score) and the radiological measurements (with the head erect and mouth closed, and with the head fully extended on the neck and the mouth fully) represent atlanto-occipital extension. We addressed in our paper the reliability of the Wilson risk sum score. We included all of the radiological measurements described by Bellhouse and Doré.<sup>2</sup> Therefore, we do not follow Dr. Karkouti's statement regarding Bellhouse's study.

*Of importance, our model was validated with bootstrapping. Our model was developed on data from 65 patients and not only from the 25 patients who were difficult to intubate. Dr. Karkouti's comments on the ROC curve are incorrect. For detailed discussion on the area under ROC curve, see Hanley and McNeil.<sup>3</sup> We are currently conducting a clinical study on a different population of patients to evaluate whether the scale applies.*

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#### References

- 1 Naguib M, Malabarey T, AlSatli RA, Al Damegh S, Samarkandi AH. Predictive models for difficult laryngoscopy and intubation. A clinical, radiologic and three-dimensional computer imaging study. *Can J Anesth* 1999; 46: 748–59.
- 2 Bellhouse CP, Doré C. Criteria for estimating likelihood of difficulty of endotracheal intubation with the Macintosh laryngoscope. *Anaesth Intensive Care* 1988; 61: 329–37.
- 3 Hanley JA, McNeil BJ. The meaning and use of the area under a receiver operating characteristic (ROC) curve. *Radiology* 1982; 143: 29–36.

### *Is aspiration prophylaxis necessary before spinal anesthesia for Cesarean section. ?*

To the Editor:

Failure of spinal anesthesia (SA) for Cesarean section (CS) necessitating general anesthesia (GA) and tracheal intubation is extremely low. However, aspiration prophylaxis (AP) is recommended because of the possibility of either failure or excessive spread of spinal block requiring GA. We have reviewed, retrospectively, the penoperative course of parturients undergoing CS under SA at our hospital from 1991 to 1993. When spinal block failure occurred, sodium bicarbonate *po* was administered prior to GA. Among the 743 cases that we reviewed, failure occurred in 15 cases (2%) because of inadequate analgesia (1.9%) or prolonged surgery for hysterectomy (0.1%). No case required intubation due to excessive block. No pulmonary aspiration was identified. In a survey of 165 academic departments in the USA and Canada, Greenhalgh<sup>1</sup> found that 94% of elective and 99% of emergency CS patients received aspiration prophylaxis. Plumer<sup>2</sup> found that 88% of the anesthesiologists attending a major obstetric anesthesia conference in the USA routinely gave prophylaxis