That being said, the Abbott Lifecare® 4100 PCA Plus II Infusion Pump is unique in several important respects. First, according to Abbott, by 2000, this device was the market leader, was used around the world, and accounted for about 75% of all PCA use in the U.S., being used in nearly 4,000 hospitals there.[3,4] *Furthermore, in 2001, ECRI (formerly the Emergency Care Research Institute, www.ecri.org) stated "this pump has a significant safety problem".*[5] *In late 2002, ECRI continued to receive reports of deaths from programming errors with this pump.*[6] *These deaths were not included in our epidemiological analysis.*

Second, "the Abbott PCA pumps are the only pumps that ECRI is aware of that can default to a low concentration setting".[6] *As we explained in our article, this design feature has important safety implications. For example, accepting an initially displayed concentration value of 0.1 mg·mL^{-1} could lead to an over-infusion of analgesic when a more concentrated drug preparation is used (e.g., 1 mg·mL^{-1} or 5 mg·mL^{-1}). In contrast, accepting the initially displayed concentration value of 0.0 mg·mL^{-1}, as provided by other PCA pumps described by Dr. Chan, presumably does not lead to any infusion — a fail-safe design feature. In retrospect, given that no study of this type had ever been conducted, analyzing the market leader that has unique design features linked with patient safety seems worthwhile.*

We agree with Dr. Chan that human factors analyses of other PCA pumps should be conducted and we encourage him and others to do so. If objective scientific evidence eventually confirms Dr. Chan's opinion that all PCA pumps are equally error-prone, then the threat to patient safety of PCA use is even greater than anticipated; the total number of deaths from concentration programming errors alone could be greater than our initial upper estimate of 667.[1] *This would make the application of human factors engineering design principles to protect public health even more urgent.*

Kim J. Vicente PhD
Karima Kada-Bekhaled MA
Gillian Hillel BASc
Andrea Cassano
Beverley A. Orser MD
Toronto, Ontario

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Another use for the forced air warmer

To the Editor:

A 14-yr-old, developmentally delayed girl presented for emergency debulking of a cerebral tumour. As a result of hemorrhage into the tumour she had become comatose and had been placed on mechanical ventilation. Vital signs revealed a heart rate of 140·min^{-1}, blood pressure of 125/80 mmHg and a nasopharyngeal temperature of 39°C. The peripheries were noted to be cool, despite the patient's febrile condition, with delayed capillary refill, but a satisfactory oxygen saturation of 98% was obtained by pulse oximetry. Anesthesia and surgery proceeded uneventfully until two hours into the case, when the pulse oximeter waveform became smaller and the value for oxygen saturation began to fall. Manual ventilation with 100% did not improve the displayed oxygen saturation. Hemodynamic status and end-tidal CO_2 remained unchanged. The surgeon felt that air embolus was very unlikely at that time in the procedure. The extremities were again noted to be poorly perfused and the recorded oxygen saturation was found to be equally low (approximately 60%) or unrecordable in both hands and feet. An arterial blood gas revealed a PO_2 of 492 mmHg, suggesting that the problem was with poor peripheral perfusion, not hypoxemia. Volume loading failed to improve the peripheral perfusion and the waveform and value remained unreliable for 30 min. An attempt was then made to improve peripheral perfusion by the local use of a forced air warmer to a foot. Within five minutes, a satisfactory waveform was re-established and oxygen saturations of 100% were obtained. The waveform and values remained satisfactory for the rest of the case. This event demonstrated that a forced air warmer can

improve peripheral perfusion to an extremity and improve the reliability of a poorly functioning pulse oximeter. Two caveats exist. Firstly, the reason for poor perfusion should also be sought and treated (e.g., hypovolemia, sepsis). Secondly, great care must be taken to avoid thermal injury by appropriate diffusion of air flow and regular inspection of the limb.

Robin Cox FRCPC
Calgary, Alberta

Laryngeal mask airway for preservation of the external branch of the superior laryngeal nerve during thyroid surgery

To the Editor:
We read with interest the article by Hillerman *et al.*[1] concerning laryngeal nerve identification during thyroid surgery using the laryngeal mask airway (LMA). Although postoperative voice changes are usually attributed to recurrent laryngeal nerve injury, the external branch of the superior laryngeal nerve (EBSLN) is also at risk since it runs close to the superior thyroid artery, which is ligated during surgery.[2] Injury to the EBSLN occurs in 4–10%[3,4] of patients and results in huskiness and voice fatigue since it is the only motor supply for the cricothyroid muscles, which tense the vocal cords. Identification of the EBSLN and individual ligation of the superior thyroid vessels are imperative to avoid injury. A particular problem during dissection is that the pharyngeal wall is soft and collapsible making exposure of the EBSLN difficult. A technique we discovered which overcomes this problem is to use the LMA to control the tension and position of the pharyngeal wall. The technique involves insertion of the LMA behind the tracheal tube and inflation of the cuff until the surgical conditions are optimal. The technique can also be used when the LMA is the ventilatory device, but the range of cuff volumes is more restricted since the seal with the pharynx must remain intact. We have used this technique on 17 patients and have had no problems with location of the EBSLN.

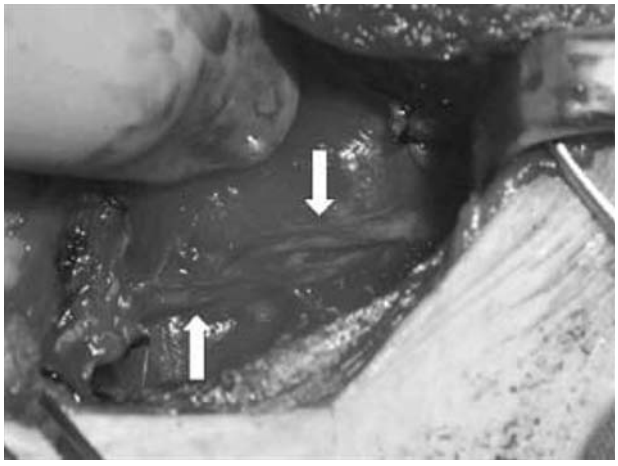

FIGURE Thyroid surgery with the laryngeal mask airway. View of left side of the neck during dissection. By splinting open the pharynx, the cuff facilitates identification and preservation of the external laryngeal nerve and its branches (arrows).

Joseph Brimacombe MB CHB FRCA MD
John Knott MB BS FRCS FRACS
Cairns, Australia
Christian Keller MD
Innsbruck, Austria

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Prophylactic iv metaraminol during spinal anesthesia for elective Cesarean delivery

To the Editor:
The use of potent vasopressors to combat maternal hypotension following spinal anesthesia for Cesarean delivery is increasingly common despite initial concerns of fetal compromise.[1] Metaraminol is a mixed alpha- and beta-adrenergic agonist with a predominant alpha effect at a clinical dose. A recent study showed that it is associated with less neonatal acidosis and more closely controlled arterial pressure compared with ephedrine.[2] This double-blinded study evaluated prophylactic metaraminol on fetal acid-base status.