regarding the frequency of drug errors and concluded that most anesthesiologists (85% of the participants) experienced at least one drug error. The commonest error was a syringe swap involving a muscle relaxant. Most errors were of minor consequence, however, serious morbidity and mortality resulted from clearly preventable events.

We would be interested to hear from colleagues with similar experiences from other institutions.

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Drug labelling and a near miss in the labour suite

To the Editor:

An emergency Cesarean section in an otherwise healthy female gravida 1 para 0 occurred in the labour and delivery operating room. The fetus was entrapped by a non-relaxed uterus. The senior resident reached for the nitroglycerine and found the bottle depicted on the right of the Figure. Usually the bottle on the left is stocked in our labour suite, which is half the concentration of the one on the right. If he had not been vigilant and simply administered the usual "volume" the resultant overdose might have resulted in hypotension and possibly excessive uterine relaxation with associated risks of hemorrhage. Why highlight what was merely a "near miss" as surely the safety mechanism worked to prevent an adverse event occurring: the resident read the label prior to administration of the drug, he had the training and knowledge of the correct dose required and did not make an error? In the airline industry such reporting of near misses to organizations such as NASA's Aviation Safety Reporting system has been credited with the reduction or uncovering of latent errors in that industry. The latent error here was the stocking of the wrong concentration of the drug on the anesthetic cart. We would contend that, as shown in the Figure, less than clear labelling by the drug company

FIGURE

might have contributed. However, when the drug company was contacted to highlight the potential problem they replied that no action was required. Their labelling does meet Canadian standards as suggested by the Canadian Society of Hospital Pharmacists guidelines for drug labelling.

A recent publication has highlighted the need to reduce avoidable adverse events in Canadian hospitals¹ and reduction of drug error would go some way to achieving this. There are prior case reports of serious drug errors due to failure to read the ampoule label correctly² and in one study of 2,000 incident reports, drug ampoule mix up occurred in 33% of "wrong drug" administration errors.³ Use of differing sizes of syringe and standardization of syringe labelling may go some way to reducing error but we still need to ensure that what is drawn up is the correct strength of the correct drug.⁴ A checking protocol in which two individuals check each drug has been suggested to reduce error.³ However, often in the emergency situation there is no one to check; in one survey of New Zealand anesthesiologists a second person was available to check for only 42% of respondents and only 1.5% used a routine second check for all drugs.⁵

Vigilance is key. We suggest that clear unambiguous labelling might be beneficial in reducing potential drug errors. Drug manufacturers must collaborate with health care providers to meet the challenge for safer health care.

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Narcotrend® depth of anaesthesia monitoring in infants and children

To the Editor:

The Narcotrend® monitor (NM; MT MonitorTechnik, Bad Bramstedt, Germany) performs a computerized analysis of the electroencephalogram (EEG) which results in an index indicating the hypnotic component of anaesthesia, the Narcotrend index (NI; 100 = awake; 0 = very deep hypnosis).^{1,2} Schultz *et al.*³ recently demonstrated the benefits of the NM in children during cochlear implantation, whereas data on the NI in children under sevoflurane anaesthesia are currently not available. In this preliminary study we investigated the performance of the NM in infants and pre-school children anesthetized with sevoflurane.

After approval of the local Ethics Committee and written informed parental consent was obtained, 20 pediatric patients, aged five months to six years [stratified for age: less than three years ($n = 10$); greater than three years ($n = 10$)], ASA classes I and II, scheduled for elective minor surgery were studied. The NI was obtained under awake and anesthetized condi-

FIGURE The pharmacodynamic relationship between end-tidal sevoflurane percentage and the Narcotrend index (NI). The inhibitory sigmoid $E_{\max}$ model: $E = E_{\max} - (E_{\max} - E_0) [C^\gamma / (C^\gamma + EC_{50}^\gamma)]$. C is the sevoflurane concentration; E is the effect (NI), EC_{50} is the sevoflurane concentration at half-maximal effect and γ is the shape parameter. $E_{\max}$ is a scaling parameter that provides the full NI-scale range (0–100). C was set to 0 at $E_{\max}$ and to infinity at E_0 , and γ was set to 1. The EC_{50} was estimated, with a 95% confidence interval (CI). Modelling revealed an r^2 of 0.85 and an EC_{50} of 1.47% (95% CI 1.34–1.65%).

tions (sevoflurane/nitrous oxide). Steady state end-tidal sevoflurane concentrations (eT_{Sevo}) were correlated with the NI, a pharmacodynamic relationship between eT_{Sevo} and the NI was determined by an inhibitory sigmoid $E_{\max}$ model, and the prediction probability (P_K)⁴ for discrimination of awake *vs* anesthetized for the NI were calculated. The choice of the induction technique (propofol or inhalational with sevoflurane), and sevoflurane delivery during the maintenance phase were at the discretion of the primary anesthetic caregiver, who was not involved in this study, and was blinded to the NM.

Awake NI values could be measured in ten patients. We observed no overlap of NI values under awake and anesthetized conditions ($P_K = 1.0$). There was a significant negative correlation between eT_{Sevo} and the NI ($r = -0.76$, $P < 0.0001$). Results of pharmacodynamic modelling are given in the Figure.

We could demonstrate a significant correlation between a decrease in eT_{Sevo} and an increase in NI. Correlations between eT_{Sevo} and NI were not different