

# Reducing medication errors

Beverley Orser

Public concern regarding medication errors was heightened by the recent death of infant Trevor Landry from a narcotic overdose in a Toronto-area hospital.<sup>1</sup> This case involved the mistaken administration of morphine instead of meperidine postoperatively. A colleague and I reported a near-fatal medication error during general anesthesia that resulted from the misidentification of look-alike ampoules containing epinephrine and glycopyrrolate.<sup>2</sup> Indeed, the medical literature is replete with anecdotal reports of medication errors that raise disturbing questions. How often do such tragedies occur in Canada? Have the jury's recommendations from the coroner's inquest into Trevor Landry's death been adopted by most Canadian hospitals? Unfortunately, we don't know the answers to these questions because no mechanism exists in Canada to track medication errors or to develop strategies to prevent their occurrence. One of the jury's recommendations from the inquest was that "medical professionals become more proactive rather than reactive to prevent drug errors before they occur."

Two major initiatives aimed at reducing the likelihood of medication errors in Canada are discussed in this article. However, these initiatives will be implemented only if physicians and pharmacists demand improved safeguards to the drug delivery system. If a sense of responsibility is not sufficient motivation, it is sobering to consider the potential legal consequences of causing a medication error. In New Zealand, since 1982 at least 4 health care professionals have been found guilty of manslaughter on charges arising from fatal medication errors.<sup>3</sup> In Canada, Trevor Landry's death was considered to be a homicide.

Medication errors contribute significantly to patient morbidity and mortality and are associated with a considerable cost to the health care system.<sup>4-7</sup> One contributing cause is the misidentification of drug ampoules or vials. Confusing, inaccurate or incomplete labels and packaging contributed to 21% (248/1143) of the actual or potential drug errors reported the US Pharmacopeia Practitioners' Reporting Network (USP PRN) over a 1-year period (Diane Cousins, vice-president, USP PRN: personal communication; 1999). To combat the problem of poorly designed drug labels, a new voluntary Canadian standard for the labelling of drug ampoules, vials and pre-filled syringes (CAN/CSAZ264.2) was recently published by CSA International.<sup>8</sup> This standard defines the minimum design requirements for the presentation of critical information on the inner label for parenteral drugs. The standard was adapted from previous guidelines developed by the Canadian Soci-

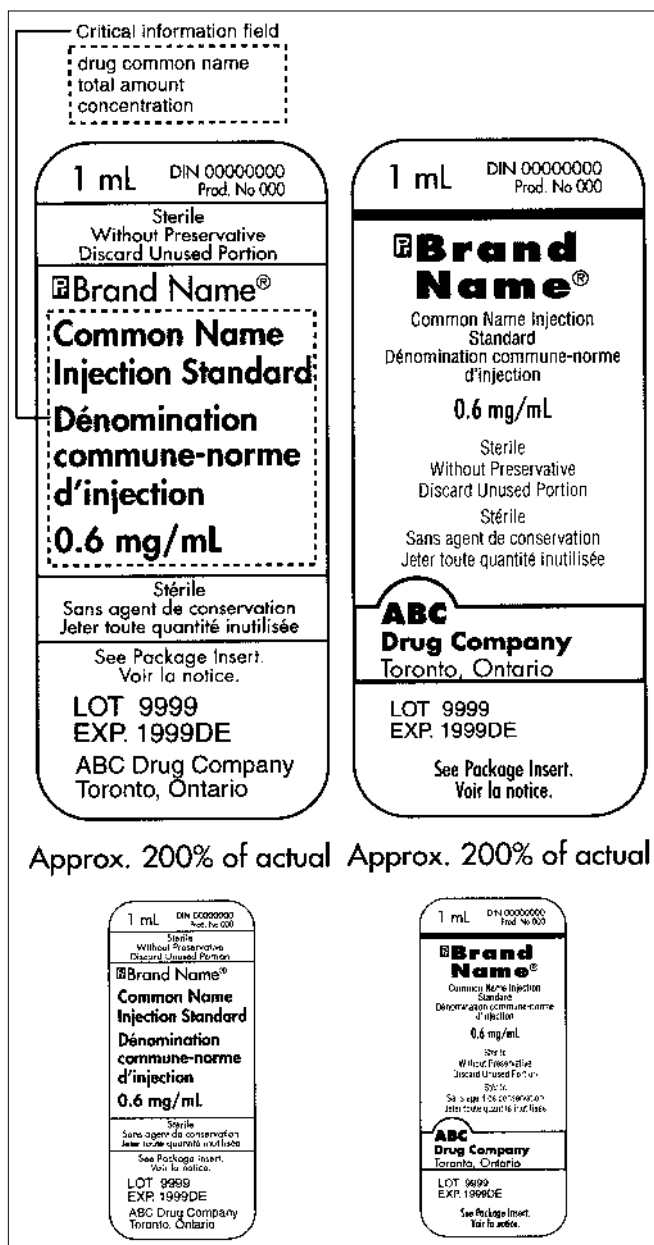


Fig. 1: The label on the left, for a 1-mL ampoule, complies with the CSA International standard.<sup>8</sup> The label on the right complies with current regulations adopted by Health Canada.

ety of Hospital Pharmacists and was based on the consensus opinion of a committee of pharmacists, physicians, nurses, engineers and representatives from pharmaceutical manu-



Fig. 2: Examples of current labelling practices of vials.

facturers and consumer groups. The main change to the drug label is the introduction of a critical information panel or field (Fig. 1). This field presents the generic name of the drug, the total amount per total volume and the drug concentration in black text on a white background. The brand or proprietary name of the drug is allowed only if space on the label permits. The proprietary name must be no larger than the size of the generic name. In addition, the legibility of the critical information is defined by standards set by the National Aeronautics and Space Administration.<sup>9</sup> Creative colour and graphics are acceptable provided they do not intrude on the critical information field. Examples of current labelling practices appear in Fig. 2.

Safe drug administration is the responsibility of health care providers and drug regulatory authorities. Therefore, it is the responsibility of these groups to ensure that the new CSA labelling standard is implemented. At present, implementation of this standard is voluntary. In the absence of enforceable regulations, compliance by the drug industry cannot be assured. It is hoped that Health Canada will adopt CAN/CSAZ264.2 as a regulation. Until then, physicians who serve as chairs on hospital pharmacy and therapeutics committees, directors of pharmacy or members of risk management committees must ask pharmaceutical suppliers if the labels on their parenteral drug products comply with the CSA International standard. Moreover, drug labels that are difficult to read must be brought to the attention of the supplier and alternative products considered.

The next step toward a safer drug delivery system is the establishment of a Canadian agency for reporting medication errors. This agency would be similar to the USP PRN and the American Institute of Safe Medical Practice (ISMP). The MedMARx program of the US Pharmacopeia ([www.usp.org](http://www.usp.org)) enables health care professionals to report anonymously their concerns regarding the quality, safety, performance or design of products used in their practice. This nonprofit organization identifies underlying causal mechanisms and develops strategies to prevent their recur-

rence. This information is then shared with industry and the appropriate government agencies. Although individual hospitals in Canada currently have reporting programs for adverse drug events, these programs are relatively ineffective because large databases are required to identify rare but recurrent events. The Canadian Society of Hospital Pharmacists has recently established a task force to explore strategies for a national reporting program for medication errors. In addition, David U, a Canadian pharmacist, is working with Michael Cohen, president of ISMP in the United States, to establish ISMP Canada. Physicians who would like to provide input into the development of a national reporting program can contact Bill Leslie, Executive Director, Canadian Society of Hospital Pharmacists, 350–1145 Hunt Club Rd., Ottawa ON K1V 0Y3; [bleslie@cshp.ca](mailto:bleslie@cshp.ca); or David U, ISMP Canada, 79 Castleridge Dr., Richmond Hill ON L4B 1R8; [dauidu@netcom.ca](mailto:dauidu@netcom.ca).

Medication errors are an inevitable consequence of the human condition; they occur even among the most conscientious medical professionals. If health care professionals do not demand, on behalf of their patients, reasonable safeguards to reduce the likelihood of medication errors, no one else will.

*Dr. Orser is Chair of the Subcommittee on Labelling and Packaging of Drug Ampoules and Vials of CSA International and is Associate Professor of Anesthesia and Physiology at the University of Toronto. She is also an anesthetist working in the Department of Anesthesia at the Sunnybrook & Women's College Health Sciences Centre, Toronto, Ont.*

*This article has been peer reviewed.*

Competing interests: None declared.

## References

1. Recommendations of coroner's jury from the inquest into the death of Trevor Landry, Jan 4–Feb 17, 1999 (Mississauga, Ont.).
2. Orser BA, Oxorn DC. An anaesthetics drug error: minimizing the risk. *Can J Anaesth* 1994;41:120-4.
3. Merry AF, Peck DJ. Anaesthetists, errors in drug administration and the law. *N Z Med J* 1995;108:185-7.
4. Leape LL, Brennan TA, Laird N, Lawthers AG, Localio AR, Barnes BA, et al. The nature of adverse events in hospitalized patients. Results of the Harvard Medical Practice Study II. *N Engl J Med* 1991;324(6):377-84.
5. Leape LL. Error in medicine. *JAMA* 1994;272(23):1851-7.
6. Schneider PJ, Gift MG, Lee YP, Rothermich EA, Sill BE. Cost of medication-related problems at a university hospital. *Am J Health Syst Pharm* 1995; 52(21):2415-8.
7. Currie M, Mackay P, Morgan C, Runciman WB, Russell WJ, Sellen A, et al. The Australian Incident Monitoring Study. The "wrong drug" problem in anaesthesia: an analysis of 2000 incident reports. *Anaesth Intensive Care* 1993; 21(5):596-601.
8. Labelling of drug ampoules, vials, and prefilled syringes [CAN/CSA Z264.2-99]. Toronto: CSA International [formerly the Canadian Standards Association].
9. Man-systems integration standards [NASA-STD-3000]. Vol. I, rev B-1995. Washington: National Aeronautics and Space Administration; 1995.

**Correspondence to:** Dr. Beverley Orser, Departments of Anesthesia and Physiology, Rm. 3318, Medical Sciences Building, University of Toronto, 1 King's College Circle, Toronto ON M5S 1A8; fax 416 978-4940; [beverley.orser@utoronto.ca](mailto:beverley.orser@utoronto.ca)