The Institute for Safe Medication Practices Canada (ISMP Canada) is an independent national nonprofit agency established for the collection and analysis of medication error reports and the development of recommendations for the enhancement of patient safety.

The Healthcare Insurance Reciprocal of Canada (HIROC) is a member-owned expert provider of professional and general liability coverage and risk management support.

Volume 5, Issue 4

ISMP Canada Safety Bulletin

April, 2005

Report of Near Miss with Succinylcholine Warrants Action

A potentially fatal near-miss report led ISMP Canada to investigate the contributing factors. The findings identified a need to (1) alert all Canadian hospitals and (2) improve product labelling and packaging.

Near-Miss Report

A 10-mL vial of succinylcholine chloride was mistaken for a 10-mL vial of sodium chloride 0.9% and was used for reconstitution of a medication in an operating room. The anesthesiologist noticed the error and reported it to the pharmacy, asking that remedial actions be taken to prevent recurrence.

Findings

The error occurred after simultaneous changes in two products (Figures 1 and 2).

Previous products were familiar and readily distinguishable.

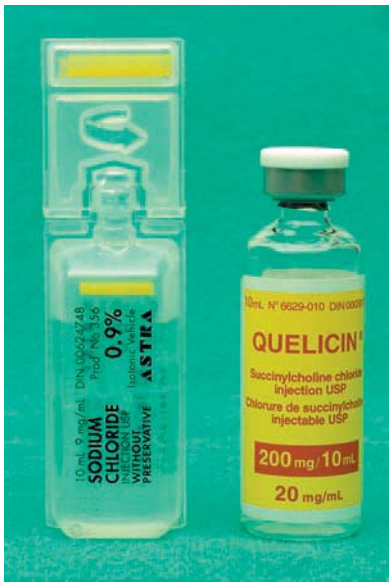

Figure 1. From left to right, previous 10-mL sodium chloride 0.9% Polyamp (product discontinued) and previous 10-mL vial of succinylcholine chloride.

1. The sole supplier of succinylcholine chloride (Hospira, formerly Abbott) recently changed the product packaging from a unique long, slim vial to a vial that is similar in shape and size to other vials including a 10-mL vial for sodium chloride 0.9% (also from Hospira). In addition, both product labels contain yellow colour with red print.
2. Because of the discontinuation of sodium chloride 0.9% Polyamp vials (AstraZeneca), the hospital recently purchased the sodium chloride 0.9% product from Hospira.
3. The simultaneous occurrence of these two product changes will affect many hospitals and pose a risk for confusion.
4. The potentially fatal outcome of a mix-up between the two products warrants this alert, as well as action from the manufacturer and from Health Canada.

ISMP Canada has contacted Hospira to alert them of this near miss. Hospira has agreed to meet with ISMP Canada to discuss potential improvements to product packaging and labelling to enhance patient safety.

Simultaneous Look-a-like Product Changes Pose Risk of Mix-up

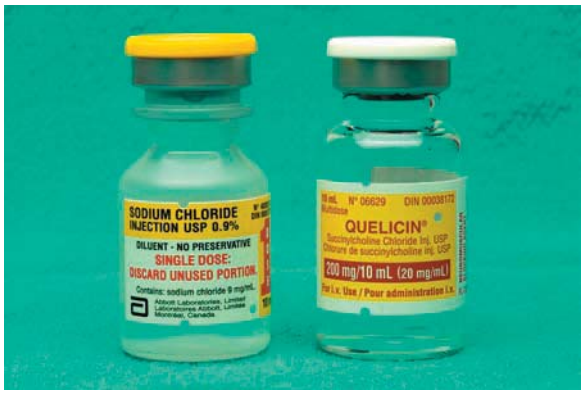

Figure 2. From left to right, 10-mL vial of sodium chloride 0.9% and new 10-mL vial of succinylcholine chloride, both manufactured by Hospira.

ISMP Canada recommends that Canadian health care organizations take the following steps:

1. Bring this bulletin to the attention of relevant committees such as the Safe Medication Practices Committee or the Pharmacy and Therapeutics Committee.
2. Create a warning label to be affixed to **all** neuromuscular blocking agents. An example label is provided:

> **WARNING: Paralyzing Agent**
> Causes Respiratory Arrest
> For use in intubated patients only.

   Alternatively, order commercial warning labels from label suppliers, such as Pharmasystems.
3. Sequester and segregate all neuromuscular blocking agents in storage areas. If these agents must be stored in patient care areas (such as the emergency department or critical care areas), place the vials in plastic bags and apply the auxiliary warning label on both sides of the bag. Consider providing additional

labels that can be applied to the final product prepared for administration.

4. When there is a change in product because of a new supplier contract or because of product discontinuation, it is imperative that point-of-care communication be provided by the pharmacy. Unexpected changes can be a set-up for human error.

The dangers associated with current packaging and labelling of neuromuscular blocking agents and the opportunity for standardization need to be addressed.[1,2] It is time to formulate a requirement that all Canadian pharmaceutical manufacturers package neuromuscular blocking agents in vials such that the cap (see Figure 3), metal ferrule, and overseal state **"Warning: Paralyzing Agent"** or **"Paralyzing Agent"**. The overseal should be transparent to allow visualization of the warning label. It is also recommended that the closure system be coloured in red (e.g., Pantone Red 811).[2] The goal is to make neuromuscular blocking agents readily identifiable in packaging and labelling. ISMP Canada has contacted Health Canada regarding this important issue.

Figure 3: From left to right, existing cap for 10-mL vial of succinylcholine chloride and an example of the proposed requirement for caps of all vials containing a neuromuscular blocking agent.

References:

1. Neuromuscular blocking agents – time for action. ISMP Canada Safety Bulletin 2002;2 (12):1-2.
2. "Paralyzing" mix-ups in the operating room: opportunity to improve safety with neuromuscular blockers. ISMP Canada Safety Bulletin 2004;4(7):1-2. Available at: http://www.ismp-canada.org/download/ISMPCSB2004-07.pdf. Accessed 2005 April 13.

Peritoneal Dialysis Solutions with Icodextrin (Extraneal™) Can Lead to False Elevations in Blood Glucose Monitor Readings

ISMP Canada has received two reports from hospitals, one involving multiple patients, about falsely elevated blood glucose monitor readings for patients receiving a peritoneal dialysis (PD) solution containing icodextrin. In the first report, the patient's blood glucose level, measured with an Accu-Chek® monitor, was 14.3 mmol/L whereas the serum laboratory value was 3 mmol/L. The patient exhibited decreased level of consciousness and periods of apnea and required treatment with 50% dextrose administered intravenously (IV).

In the second hospital, the blood glucose levels of several patients undergoing peritoneal dialysis were routinely checked with an Accu-Chek® monitor, the glucose readings were 4 to 10 mmol/L higher than the results obtained by laboratory testing of venous samples. In all cases, the patients experienced delays in receiving treatment (dextrose 50% IV or oral glucose) for their hypoglycemia.

This phenomenon has been reported previously.[1,2,3] Certain glucose monitoring systems cannot distinguish between icodextrin byproducts (e.g. maltose) and glucose, which leads to falsely elevated glucose readings. Health Canada recently released a Notice to Hospitals[4] as well as an advisory bulletin to diabetic patients using the PD solution containing icodextrin (Extraneal™; sold in Canada by Baxter).[5]

References:

1. Mehmet S, Quan G, Thomas S, Goldsmith D. Important causes of hypoglycemia in patients with diabetes on peritoneal dialysis. Diabet Med 2001;18(8):679-682.
2. Oyibo SO, Pritchard GM, McLay L, James E, Laing I, Gokal R, et al. Blood glucose overestimation in diabetic patients on continuous ambulatory peritoneal dialysis for end-stage renal disease. Diabet Med 2002;19(8):693-696.
3. Disse E, Thivolet C. Hypoglycemic coma in a diabetic patient on peritoneal dialysis due to interference of icodextrin metabolites with capillary blood glucose measurements [letter]. Diabetes Care 2004;27(9):2279.
4. Notice to hospitals: Health Canada endorsed important safety information on glucose monitoring systems. Ottawa (ON): Health Canada; 2005 Mar 23. Available at: http://www.hc-sc.gc.ca/hpfb-dgpsa/tpd-dpt/glucose_monitors_nth_e.html. Accessed 2005 Apr 11.
5. Health Canada online advisory: Health Canada advises diabetic patients receiving Extraneal™ peritoneal dialysis solution about the risk of falsely elevated blood glucose monitor readings. Ottawa (ON): Health Canada; 2005 Mar 24. Available at: http://www.hc-sc.gc.ca/english/protection/warnings/2005/2005_16/html. Accessed 2005 Apr 11.

ISMP Canada is a national voluntary medication incident and 'near miss' reporting program founded for the purpose of sharing the learning experiences from medication errors. Implementation of preventative strategies and system safeguards to decrease the risk for error-induced injury and thereby promote medication safety in healthcare is our collaborative goal.

To report a medication error to ISMP Canada: (i) visit our website www.ismp-canada.org, or (ii) e-mail us at info@ismp-canada.org, or (iii) phone us at 416-480-4099. ISMP Canada guarantees confidentiality and security of information received. ISMP Canada respects the wishes of the reporter as to the level of detail to be included in our publications.

A Key Partner in the Canadian Medication Incident Reporting and Prevention System (CMIRPS)