The Institute for Safe Medication Practices Canada (ISMP Canada) is an independent Canadian 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.

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An Omnipresent Risk of Morphine-Hydromorphone Mix-ups

The following bulletin is written jointly by ISMP Canada and ISMP (US). This article also appears in the July 1, 2004 issue of the ISMP Medication Safety Alert!

ISMP Canada recently received an error report in which a 69-year-old patient was given 10 mg of hydromorphone IM instead of 10 mg of morphine. The error may have contributed to the patient's death. The patient presented to the emergency department (ED) with a chest injury sustained while horseback riding. Prior to discharge, the ED physician wrote an order for morphine 10 mg IM for pain, but hydromorphone was mistakenly selected from a narcotic drawer. Both hydromorphone and morphine were stocked in 1 mL, 10 mg/mL ampuls. In Canada, the two products are visually distinct in appearance; nevertheless, the names are similar and the concentrations are identical. According to equianalgesic dose conversion charts, the patient, who was likely opiate-naïve, received an equivalent dose of about 60 to 70 mg of morphine. Shortly after the patient was discharged, the nurse discovered the error after a scheduled narcotic count showed a discrepancy between the two drugs. Hospital staff immediately tried to contact the patient, and finally located him in a rural hospital ED close to his home. By then, the patient's condition had deteriorated, and he arrested a short time later. Despite rescue efforts, the patient died.

Over the years, we've received many reports of confusion between hydromorphone and morphine, some of which have been fatal. In fact, mix-ups between these drugs are among the most common and serious errors that can occur involving two high-alert drugs. It's a risk that exists in almost every acute care facility. Assume that this error will eventually happen in your facility, and take the following steps now to reduce the risk of patient harm.

Limit access. Reduce stock amounts of hydromorphone wherever possible, and eliminate it from floor stock entirely if usage is low. For example, the health system where this error occurred has now removed all hydromorphone from every ED in the health region. If the drug is needed on patient care units, only the 2 mg/mL strength is available, except in palliative care units. The distribution of other high potency narcotics is also being revised. The pharmacy will continue to stock hydromorphone for compounding PCA or continuous infusions.

Reduce options. If both drugs are available in patient care units, avoid stocking morphine and hydromorphone in the same strength. For example, since both drugs are available in 2 mg and 4 mg prefilled syringes (in the US), stock 2 mg of hydromorphone and 4 mg of morphine (but not vice versa, since 4 mg of hydromorphone could be an excessive dose). If the drugs are stored in an automated dispensing cabinet, consider allowing access to morphine via an override function in emergencies, but require pharmacy order review before removing a first dose of hydromorphone. Also be sure to store each medication in a separate, individual bin or drawer in the cabinet to help prevent drug selection errors. In the pharmacy, segregate prefilled syringes and vials of these drugs, especially if they contain the same concentration.

Reduce "look-alike" potential. When able, use tall man lettering to emphasize the "HYDRO" portion of hydromorphone on pharmacy labels, auxiliary labels, medication administration records, and drug listings on computer screens or automated dispensing cabinets. Consider adding label reminders on hydromorphone indicating the brand name equivalent, "**DILAUDID**," to help prevent confusion. Some automated dispensing cabinets may also offer the capability of asking, "This is

DILAUDID. Is that correct?" when nurses retrieve hydromorphone.

Require redundancies. Require an independent double check before administering IV narcotic doses. Since nurses routinely obtain narcotics from floor stock, the typical pharmacist-nurse double-check is not in place (as it is with specific patient doses dispensed from the pharmacy). Some automated dispensing cabinets can be programmed to require a "witness" when selected narcotics are removed, or when the override feature is used to access selected narcotics. Reminders can also appear on the screen.

Educate staff. Provide safety information on the use of potent narcotics via newsletters and inservices. Educate staff about the differences between hydromorphone and morphine, as some of the reported mix-ups have been due to the mistaken belief that hydromorphone is the generic name for morphine. (Visit www.ismp.org/IMAGES/Posters/Poster_10.gif to order a poster that helps highlight this problem.)

Employ technology. Technological solutions (e.g., bar coding, automated dispensing technology that requires pharmacy order screening prior to dose retrieval) may reduce, but not eliminate, the risk of mix-ups.

Educate patients. Prior to administration of a narcotic, repeat the name of the medication out loud to the patient as another source of confirmation.

Monitor patients. Implement policies that specify the scope, frequency, and duration of monitoring that should occur before discharging patients who have just received a parenteral narcotic.

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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) email 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.

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