The Institute for Safe Medication Practices Canada (ISMP Canada) is an independent Canadian non-profit 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 3, Issue 12

# ISMP Canada Safety Bulletin

December, 2003

## Methadone: Not Your Typical Narcotic!

Methadone, a synthetic opioid, is likely the least understood narcotic, due in part to its infrequent use outside of specialized clinic settings. Methadone has been used in the management of opioid addiction and it is being used more frequently in the management of chronic pain.[1,2] The regulation of methadone prescribing and dispensing is complex, with involvement of both federal and provincial governments as well as provincial colleges of physicians and pharmacists.[3,4,5,6]

Adherence to available methadone protocols and guidelines is critical to decrease the potential for overdose.[4,5] In appropriate doses, methadone relieves cravings and withdrawal symptoms in opioid addicts, without causing sedation or euphoria.[1,2,4,5] The half-life of methadone in a tolerant patient is 18 to 36 hours with an average of 24 hours, which allows for once daily dosing. Pain management requires dosing up to every 6-8 hours.[1,2] If methadone is administered to an opioid naive patient, the half-life is approximately 55 hours, therefore the duration of effect will be extended.[2] Methadone must be titrated much more slowly than other narcotics as it typically takes five days for drug levels to stabilize. If methadone is not taken for three consecutive days, the patient may lose tolerance to their usual dose and is at risk of overdose.[1,2,5]

ISMP Canada has received several reports of methadone errors and will describe two of them in this bulletin. One report involved a newly hospitalized patient who had been taking methadone 13 mg/day prior to admission. A nurse took a telephone order from the attending physician for methadone 12 mL po daily. This physician did not have methadone prescribing privileges. The patient's community pharmacy used a methadone stock concentration of 1 mg/mL, thus the intended dose was 12 mg/day. However, the order was entered into the hospital pharmacy computer system and filled by a technician using a 10 mg/mL stock solution of methadone. The order was checked by a pharmacist against the pharmacy copy of the original order and the patient's inpatient medication profile. The methadone stock bottle was verified and the technician had left the syringe used to measure the volume pulled back to 12 mL. The dose was sent to the nursing unit and administered to the patient. The patient received 120 mg methadone, *i.e.* approximately nine times his usual dose. Fortunately he vomited much of the dose. The error was discovered when a visitor later in the day noted that the patient was more drowsy than usual and reported it to the nurse. The patient was monitored closely and recovered without any further medical intervention. Some of the contributing factors included:

- The order was given in mL not mg.
- Patients on methadone often refer to their doses in "mL" rather than milligrams.
- The attending physician was not an authorized methadone prescriber.
- The pharmacy was short-staffed on the day the error occurred.
- The hospital did not have a protocol in place requiring verification of pre-hospital methadone maintenance doses.
- Doses for methadone are not standard but are titrated to patient response, therefore mental "alarms" are not triggered except for very high doses.

In another case, a patient who was receiving methadone daily from a community pharmacy reported to the pharmacy after two days of experiencing increased pain and feeling unwell (pale, sweaty, clammy, shaky). The pharmacy's methadone log indicated that the dose prepared for the patient was 8 mL of a 5 mg/mL stock solution (total dose 40 mg). Upon checking the patient's prescription, it was discovered that the prescribed dose for the patient was 14 mL (70 mg). The patient had therefore received a significant under-dose and was experiencing narcotic withdrawal symptoms in addition to inadequate pain control. Contributing factors included**:**

- Prepared methadone dose not labelled.
- Incomplete check process and cross-reference between the prescription and the methadone log.
- Volume of methadone (mL) was used instead of dose (mg).

ISMP Canada recommends that all healthcare practitioners involved with the prescribing, dispensing or administration of methadone have policies and procedures in place for management of methadone. Consider implementing the following:

**General Recommendations:**

- A pharmacist should review and double-check all methadone orders and doses before they are administered.
- All orders should be signed by an authorized prescriber.
- A list of physicians authorized to prescribe methadone should be readily available to pharmacy and nursing staff for verification purposes.
- All methadone orders must be written in mg not mL**.**

- Physicians should write the methadone dose in words and numerals.
- Dates and times for administration should be specified. Avoid use of the word "daily" to avoid the potential of administering doses too closely together.
- Concomitant use of methadone with other narcotics, benzodiazepines, alcohol and other sedatives should be avoided as it significantly increases the risk of overdose death.[1,2,5]
- Staff administering methadone must be aware of the need to observe the patient taking the entire dose and require the patient to speak to them afterwards.
- Stock only one concentration of methadone in pharmacy if possible. If more than one concentration is required to manage patients appropriately, prominent warning labels should be used.
- Use commercially available methadone solution to prevent compounding errors. (1 mg/mL and 10 mg/mL concentrations available.)
- If compounding methadone solution from the powder, the following is required:
  - use of a standard written manufacturing formula,
  - a manufacturing log and
  - clear labelling of the finished product
- Labels on all dispensed unit doses must indicate the total dose and date for ingestion.
- Ensure that empty methadone bottles are properly disposed of to avoid accidental ingestion of any residue.
- Before administering a dose of methadone, staff must check the last dose and date received (including "carries", i.e. take home doses). If a patient has not received methadone for three consecutive days, the prescriber must be contacted to prevent overdose.[1,2,5]

**Hospital Specific Recommendations:**

- Use preprinted order forms to facilitate adherence to hospital policies, protocols, dosing and monitoring guidelines.
- Establish a clear mechanism for communication of pre-hospital methadone use to all healthcare providers involved in the delivery of methadone to the patient. Consider the use of the following checklist:
  - Community prescriber name and telephone number
  - Dosage that was verified with community prescriber
  - Community pharmacy name and telephone number
  - Last date and dose patient received from community pharmacy
  - Number of "carries" dispensed and for which dates
  - Community pharmacy advised of patient's admission and remaining methadone doses cancelled
- Encourage hospitals to have at least one authorized methadone prescriber on staff. If necessary obtain temporary authorization from Health Canada.
- Ensure secure storage of methadone on nursing units.

**Community Pharmacy Specific Recommendations:**

- Use a log to record the signature and proper identification of patients receiving witnessed and "carry" doses of methadone.
- Ensure methadone doses for witnessed administration be drawn up individually into new disposable plastic syringes, labelled with the prescription label, and secured until the patient arrives and the pharmacist can verify the dose. It is dangerous to leave unlabelled methadone doses on the dispensary counter.

ISMP Canada gratefully acknowledges the expert review of this bulletin by staff of Centre for Addiction and Mental Health, Toronto.

References:

1. Management of Alcohol, Tobacco and Other Drug Problems. 2000. Opioids, section 8, 221-284. Edited by B. Brands. Toronto: Centre for Addiction and Mental Health.
2. Managing Alcohol, Tobacco and Other Drug Problems: A pocket guide for physicians and nurses. 2002. p. 85-98. Edited by M. Kahan and L. Wilson. Toronto: Centre for Addiction and Mental Health.
3. Compendium of Pharmaceuticals and Specialties: The Canadian Drug Reference for Health Professionals. 2003. p. 1197-1199.
4. Policy Manual: Methadone. Rev'd. March 2002. The College of Physicians and Surgeons of British Columbia.
5. Methadone Maintenance Guidelines. October 1, 2001. College of Physicians and Surgeons of Ontario.
6. Health Canada, Office of Controlled Substance. Available at http://www.hc-sc.gc.ca/hecs-sesc/cds/publications/methadone_maint_treatment/mmt_delivered_in_canada.htm. Accessed January 14, 2004.



***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.***