ISMP Canada Safety Bulletin

Opioid-Related Incident in a Long-Term Care Home

This bulletin shares the findings and recommendations from an ISMP Canada review of an unexpected death at a long-term care (LTC) home. The system vulnerabilities that were identified during the analysis of this event likely exist in other facilities. All those affected by this case sincerely hope that the learning shared here will lead to system improvements in LTC homes.

Description of Incident

A resident in an LTC home had a prescription for propoxyphene 100 mg (brand name Darvon), to be taken orally at bedtime. One evening, a discrepancy was identified during the routine shift count: there was one more propoxyphene 100 mg capsule than expected and one fewer morphine sustained-release (SR) 60 mg tablet (brand name MS Contin) than expected. An incident report completed at the time the discrepancy was identified acknowledged the possibility that the resident had received morphine SR 60 mg instead of the intended propoxyphene 100 mg. However, the nurse who administered the medication thought that the correct medication had been given, and the resident, who was cognitively aware, had not questioned the medication provided (which might have been expected had the wrong medication been given, since the 2 medications differ in colour, shape, and size). The incident report also noted that the nurse who had administered medications that evening had been required to assist with another resident during the medication pass. At the time of the shift change (after the discrepancy was identified), the evening shift charge nurse consulted with the night shift charge nurse, and a decision was made to monitor the resident overnight. Chart notes described several focused checks on the resident overnight and into the early morning period, without any findings of respiratory abnormalities. The resident did not come to breakfast and was found deceased in bed.

The pathologist who reviewed the case concluded that the immediate cause of death was active chronic bronchitis and acute aspiration pneumonia with underlying chronic obstructive pulmonary disease (COPD) and congestive heart failure. Both the pathologist and a toxicologist who was consulted on the case commented that the respiratory depressant effects of morphine could not be excluded as a factor contributing to the death.

ISMP Canada's Findings

ISMP Canada was asked to review this case. As part of the review, ISMP Canada medication safety specialists visited the LTC home where the incident occurred and the pharmacy providing service to the home to gain an understanding of the medication-use system and related processes.

The reviewers observed that scheduled medications were provided to the LTC home in resident-specific, 35-dose blister cards, with one card provided for each medication administration time. Cards were stored in bins for each medication administration time, and the appropriate bins were placed in the medication cart for each medication pass. Bin dividers labelled with the residents' names were used to separate the medications for each resident. The divider for an individual patient was turned around once the person's medications had been administered, providing a visible reminder of the medications remaining to be given.

Controlled drugs, including opioids, were provided as ward stock (i.e., not in a resident-specific form) and were either packaged by the pharmacy service provider in 35-dose cards or provided in commercially available dose control packs. The same card of medication was used for all residents requiring that particular controlled medication. In the case under review, both the propoxyphene 100 mg and the morphine SR 60 mg were packaged by the pharmacy service provider in packages that were not resident-specific.

The medication-use system at this LTC home was found to be fundamentally sound; however, vulnerabilities are present in all systems, and a number of factors that may have contributed to the medication incident were identified. These potential contributing factors are listed below.

Potential Contributing Factors

Task Factors

- Narcotics were provided as ward stock, rather than with labelling for individual residents, a common practice in hospitals and some LTC homes. Ward stock systems do not offer the same level of safety as systems in which

medications are dispensed on a resident-specific basis.

- Narcotics are considered to be high-alert medications.[1] One strategy that can be used to mitigate risk with high-alert medications is independent verification or double check, but this was not mandatory for the medications involved in this case. (A policy was in place for an independent double check before administration of some other high-alert medications, specifically insulin, warfarin, and methadone.)

- It is not known if the nurses had received training on the steps to be taken to reorient themselves when restarting medication administration after an interruption.

Equipment Factors

- Both the propoxyphene 100 mg and morphine SR 60 mg were packaged in 35-dose cards with amber blisters. Amber blisters are generally recommended and used to protect medications from light during repackaging; however, this colour may make it more difficult to differentiate between medications.

- The visibility of critical information (e.g., medication name, dose) was not optimal for the medication selection process. The design of the medication blister card used by the pharmacy service provider was intended to give prominence to critical information when the cards were attached at the top to a "ring" system, with space provided at the bottom of the blister cards to affix the pharmacy label. In this LTC home, however, the medication blister cards were not stored on a ring, so the critical information was less prominent. Controlled medications were stored in a separate locked drawer in the medication cart, and other routinely scheduled medications were placed in bins to accommodate the large volume of blister cards required for each medication pass.

Environmental Factors

- It is impossible to completely eliminate or prevent interruptions in the medication administration process. In this case, the nurse administering medications was needed to assist staff in the urgent management of another resident during the medication pass.

- The incident occurred at night, and it would have been difficult for staff to assess for potential toxic effects of the medication (such as increased sedation or respiratory depression) while the resident was sleeping. (Periods of reduced external stimuli, such as nighttime, enhance sensitivity to opioid effects and are critical periods.)

Resident Factors

- Autopsy revealed that the resident had undiagnosed bronchitis and COPD, neither of which were part of the medical history. These underlying conditions may have increased the resident's sensitivity to the respiratory depressant effects of whatever medication was administered.

- Although propoxyphene was a routine medication for pain management in this individual, it is infrequently used and has since been removed from the Canadian market.

- The resident was cognitively aware and was likely to question anything unusual about medications to be administered.

Care Team Factors

- When the count discrepancy was identified, the nurses were unsure whether a medication error had occurred. This uncertainty was influenced by the following factors:
  - the resident's awareness of the medication regimen and that person's history of communicating concerns
  - the potential influence of confirmation bias (seeing information that supports one's assumptions), in this case, the belief of the nurse administering the medication that the correct medication had been administered
  - the inability of both nurses involved in the evening narcotic count to verify if the count had been correct at the start of the shift, as neither had been involved in the previous shift count

- Because the nurses were unsure whether an error had occurred, some options or interventions that might have mitigated harm were not sought or further explored:
  - the home physician was not contacted
  - no contact was made with a pharmacist, as there was no on-call pharmacist available for consultation, except during the day shift from Monday to Friday.

LTC Home Factors

- Naloxone (reversal agent) was available in the LTC home's emergency stock, but there was no protocol for urgent use without a physician's order.

The recommendations provided below are intended to reduce the likelihood of a similar medication incident.

ISMP Canada Recommendations

LTC Homes

- Review the feasibility of integrating an independent verification step before administration (i.e., double check by a second practitioner or use of technology for an automated double check) for as many high-alert medications as possible.

- Develop a triage process to ensure timely review of incidents with a potential to cause harm (e.g., those

involving high-alert medications) and to provide guidance for decision support (such as contacting the physician, on-call senior leader, on-call pharmacist, regional poison information centre).

- Consider developing standard protocols for administration of the first dose of a reversal agent, such as naloxone, that could be implemented immediately by qualified staff on the basis of predefined criteria; these standard protocols should include any follow-up actions that will be required.

- Evaluate processes for reviewing residents' medications. Develop a plan to have a pharmacist assess residents' medication regimens on admission and at periodic intervals.

- Collaborate with the pharmacy service provider and physicians working in the LTC home to identify and minimize the number and types of narcotic medications that must be kept on site. In addition, consider restricting the use of medications for an LTC home or group of homes to a smaller number of medications, in accordance with the literature on safe medication use for older adults.[2]

- Evaluate the precautions required for high-alert medications that are commonly used in the LTC population, and provide associated education for nursing staff.

- Provide education for nursing staff on recommended processes for recommencing medication administration if interrupted during the medication pass (e.g., re-identify medication and resident, discard medications that have been partially poured and restart the process).

- Develop a comprehensive medication safety strategy that considers the applicability of technology options to enhance medication safety (e.g., automated packaging systems; automated dispensing cabinets;[3] computerized prescriber order entry; electronic medication administration records; bar-code verification).

- Regularly assess the safety of the medication-use system through interdisciplinary audit and feedback programs such as the Medication Safety Self-Assessment for Long-Term Care.[4]

Pharmacy Service Providers

- Dispense narcotic medications with labelling for individual residents. Although this is not a fail-safe measure, it would provide an additional safeguard at the point of administration.

- Provide access to an on-call pharmacist, so that resources for drug information inquiries are available to LTC nurses around the clock.

- Consider strategies to enhance the visibility to nurses of

critical information during medication administration, such as locating labels appropriately on medication blister cards and containers, removing non-essential information, and evaluating and possibly modifying the order in which information is presented.

- When available, consider the use of manufacturer-prepared control packs for narcotics and other controlled drugs, to enhance differentiation between medications.

- Ensure that long-acting medications are identified as such (e.g., through use of auxiliary labelling and by grouping and categorizing them separately on record sheets for controlled drugs).

Discussion

ISMP Canada has been involved in several projects related to safe medication management in LTC environments. A 2009 report commissioned by the Ontario Ministry of Health and Long-Term Care[5] made several recommendations related to medication incident reporting, medication reconciliation, management of high-alert medications, and technology support. An aggregate analysis of voluntarily reported medication incidents occurring in the LTC environment undertaken in 2010 identified the involvement of high-alert medications as a key theme, with the majority of harmful incidents involving anticoagulants, insulin, and opioids (narcotics).[6] The Medication Safety Self-Assessment for Long-Term Care has been used by nearly 700 Canadian LTC homes since it was made available in 2007. This program has recently been updated to reflect new medication safety learning, and the results of 5 years of experience with the program will be shared in an upcoming ISMP Canada Safety Bulletin.

It is well-known that the care needs of seniors residing in LTC homes are becoming increasingly complex. Many residents have more than one medical condition, each of which requires one or more medications. The likelihood of adverse outcomes from medication incidents is increased by comorbidities (in this case, bronchitis and COPD), as well as physiologic factors, such as decreased kidney and liver function. Endeavouring to provide a home-like environment in the LTC setting creates additional complexity for medication administration and monitoring. When a critical incident occurs, a thorough analysis can help to ensure that system-based contributing factors are identified and addressed, with the goal of reducing the likelihood of recurrence of the same or a similar event and making care safer for the future. A well-designed medication-use process offers the best chance to prevent harmful medication errors.

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2012 Guidelines on Reporting and Preventing Medication Incidents Now Available

The 2012 version of *Medication Incidents: Guidelines on Reporting and Prevention*, co-developed by the Canadian Society of Hospital Pharmacists (CSHP) and the Institute for Safe Medication Practices Canada (ISMP Canada) is now available.

These consensus-based guidelines provide practical, best-practice information for healthcare organizations that are establishing programs to report and help prevent medication incidents. They are intended to support enhancements in the quality of patient care through improvements in medication-use systems in a variety of settings. As such, they are intended to augment (not replace) each healthcare organization's specific policies and procedures for medication incident reporting and prevention. The updated guidelines cover methods of reporting and analyzing medication incidents, the role of the patient and family, the sharing of learning about medication incidents, and general processes for developing strategies to prevent medication incidents. Background information is also provided on broad topics related to leadership and the nurturing of a culture of medication safety within a healthcare organization, including processes to disclose information about medication incidents.

The guidelines are available free of charge to CSHP members online at http://www.cshp.ca/productsServices/officialPublications/type_e.asp For nonmembers wishing to purchase a copy of these guidelines, please contact Colleen Drake at CSHP, by telephone at 613-736-9733, ext. 228, or by email at cdrake@cshp.ca

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