

ISMP Canada Safety Bulletin

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Reporting and Learning in Ontario Long-Term Care Homes: A Multi-Incident Analysis of Medication Incidents

A multi-incident analysis (MIA) of medication incidents in Ontario long-term care (LTC) homes was conducted as part of the Ontario *Strengthening Medication Safety in Long-Term Care* initiative.* The primary goal of the initiative is to help LTC homes, and other partners in the sector, to address the medication-related recommendations formalized by Justice Eileen E. Gillese in her report *The Public Inquiry into the Safety and Security of Residents in the Long-Term Care Homes System*.¹ The anticipated outcome of this initiative is safer medication management systems and more effective deterrence and detection of intentional and unintentional harm in LTC homes. Analysis findings and recommendations from the MIA are shared to inform targeted strategies for preventing medication errors and the associated harm to residents and their families.

METHODOLOGY

Medication incidents voluntarily reported as occurring in LTC homes in Ontario submitted over the 26-month period from June 1, 2021, to July 31, 2023, were extracted from the ISMP Canada Individual Practitioner Reporting and Consumer Reporting databases, as well as the Canadian Institute for Health Information (CIHI) National System for Incident



Reporting (NSIR) database.[†]

The extracted reports were screened, with duplicate and unrelated incident reports excluded. The analysis was conducted according to the MIA methodology outlined in the Canadian Incident Analysis Framework.[‡]

QUANTITATIVE FINDINGS

A total of 208 incidents were identified for screening: 115 from the NSIR and 93 from the ISMP Canada databases.[‡] A total of 190 cases remained after application of the exclusion criteria. Most of the incidents included in the analysis resulted in no or mild harm, with 5% causing moderate, severe harm or death (Table 1).

* The Strengthening Medication Safety in Long-Term Care initiative, funded by the Ontario Ministry of Long-Term Care, was launched by ISMP Canada in 2021. Views expressed in this document are those of ISMP Canada and do not necessarily reflect those of the Province.

† The databases are components of the Canadian Medication Incident Reporting and Prevention System (CMIRPS). More information about the databases is available from: <http://www.cmirps-scdpim.ca/?p=12>. National System for Incident Reporting (NSIR) data were provided by the Canadian Institute for Health Information (CIHI); however, the analyses, conclusions, opinions, and statements expressed herein are those of ISMP Canada.

‡ It is recognized that it is not possible to infer or project the probability of incidents on the basis of voluntary reporting systems.

TABLE 1. Level of harm associated with medication incidents in Ontario long-term care homes.

Outcome ^{3,4}	No. of Reports (n= 190)	% of Total Incidents
No error/reportable circumstance*	15	8%
Near miss	15	8%
No harm	96	51%
Mild harm	54	28%
Moderate or severe harm, death	10	5%

* Reportable circumstance is a situation that has potential for harm and does NOT involve a resident.

TABLE 2. Top 5 medications involved in incidents included in the multi-incident analysis (n=190).

Medication	% of Incidents
Hydromorphone	11%
Trazodone	7%
Acetaminophen	4%
Denosumab	3%
Amoxicillin	3%

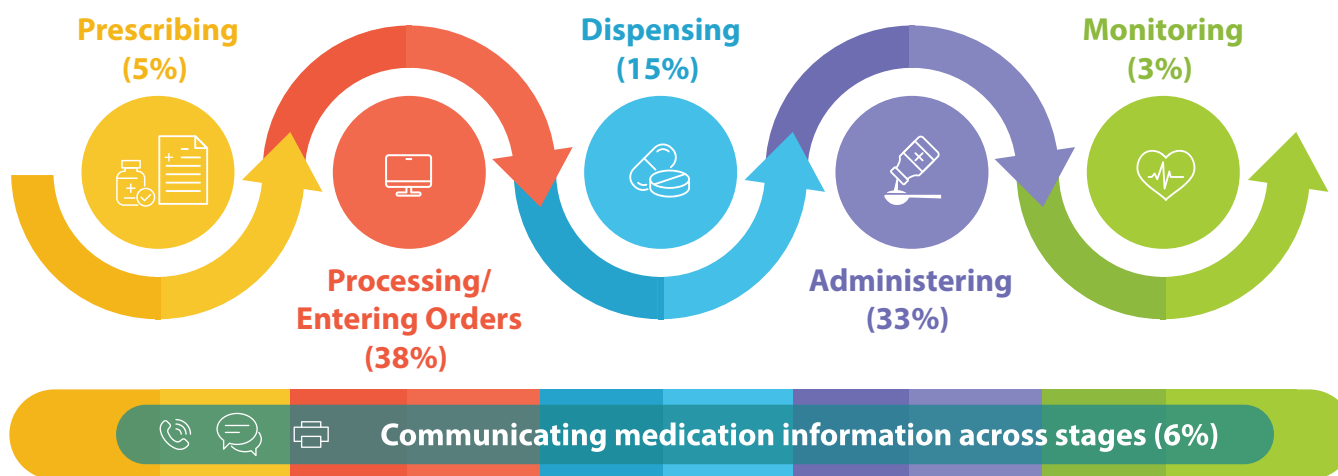


FIGURE 1. Medication incidents in Ontario long-term care (LTC) homes by stage of medication-use process. Some incidents were associated with multiple stages (n=190).

The stages of the medication-use process most frequently implicated in these reported incidents were order processing/entry and medication administration (Figure 1). The medication most frequently involved in medication incidents was hydromorphone (Table 2).

QUALITATIVE ANALYSIS

The analysis identified 4 main themes and associated subthemes (Figure 2).

- Resident Identification**
- Medication Order Prescribing and Processing**
 - Medication prescribing
 - Order entry
 - Confirmation of medication orders
 - Medication dispensing
- Communication**
 - Medication reconciliation (MedRec)
 - Medications with atypical dosing schedules
- Resident and Family Roles**
 - Resident and family engagement

FIGURE 2. Main themes and subthemes identified in the multi-incident analysis.

THEME:
Resident Identification

Proper identification of a resident is often difficult in the LTC setting because residents may not be able to verbally express their name and birth date and could choose not to wear an identifying wristband. To facilitate a home-like environment, most homes use resident photos for identification. Incidents included in this theme involved residents receiving medications intended for other residents and orders written on the wrong chart. Some of the reported errors resulted in severe harm. Two of the contributing factors identified were inconsistent staffing and interruptions during medication administration.

Some incident reports described a lack of reliable tools and processes to support correct identification of residents at the time of medication administration. Staff who work regularly in a specific home may know the residents well; however, new providers (e.g., staff from agencies, students) often experience challenges in reliably identifying residents. This is a particular risk for residents who are moved temporarily to different rooms (e.g., during an outbreak). Photos on paper or electronic medication administration records (MARs/eMARs) and/or doorways of residents' rooms may not be updated regularly, and the use of labels on residents' clothing is not a reliable mechanism to support identification. Technology to correctly identify residents (e.g., facial recognition) is not in widespread use.

***Incident Example:** During an outbreak, residents in a home were temporarily moved to different rooms. A nurse from an agency was not aware of the room changes. Using outdated location information, the nurse gave a resident someone else's medications, which included insulin, long-acting morphine, and rivaroxaban. The resident had to be transferred to hospital for an extended stay.*

**Recommendations for
LTC Homes and Regulators**

- Work with residents and their families (e.g., through resident and family councils) and experts to investigate and consider the feasibility and acceptability of technological solutions that would support identification processes.⁵
- Establish a standardized process to update resident photographs at least annually and whenever there is a significant change in resident appearance.⁵
- Schedule staff to work on the same floor/unit whenever possible.
 - Consider contractual requirement for agencies to provide a pre-requisite shadowing shift for their staff with the home's regular staff.
- Ensure the resident identification/medication administration policy includes a requirement to use two identifiers.
- Establish and maintain a just culture⁶ for staff, residents, and families to support communication and collaboration.

**Recommendations for
Nursing Teams**

- Use two unique resident identifiers (e.g., resident's full name, date of birth, photograph on the MAR/eMAR, wristband) before administration of medications.⁵
- Prepare and administer medications for one resident at a time to reduce the risk of wrong resident errors.⁷
- Involve the resident during medication administration, when possible. If privacy considerations allow, consider engaging family who may be present during administration.
- Encourage new staff to the home to consult with the home's regular nurses/personal support workers (PSWs) when needing assistance with resident identification.
- Limit interruptions during medication administration (e.g., medication pass).

THEME:
Medication Order Prescribing and Processing

Figure 3 depicts the typical steps of medication prescribing and order processing in LTC homes to provide a foundation for understanding the contributing factors and recommendations described below.

The incident analysis revealed a number of vulnerabilities in processes and tools for all of these steps.

Medication Prescribing

Ontario LTC prescribers use handwritten or digital pen technology while on site, and verbal orders when not physically present. Some homes may have computerized prescriber order entry (CPOE) systems. Errors reported included delays in processing new orders, wrong resident errors, wrong dose/route/frequency errors, omission of an order after a medication was changed during medication review,⁸ and inappropriate prescribing of antipsychotics⁹ or contraindicated medications.

***Incident Example:** A physician intended to write a prescription for hydromorphone for a particular resident, but inadvertently wrote the prescription for another resident who did not need this medication. The resident received several doses of hydromorphone before the error was discovered by a family member.*

Order Entry

Order entry is the input of a prescriber’s order into the pharmacy management software system and the eMAR system, if available. If the two systems are integrated, then it is a single point of order entry. This is usually done by pharmacy staff, but when the pharmacy is closed or a medication is urgently needed, the nurse enters the orders through the LTC home’s eMAR system. Pharmacy then verifies the order entry done by the nurse.

Examples of errors during the order entry process included entering an as-needed (prn) medication as a regularly scheduled medication, inadvertently resuming a medication that a prescriber had ordered to be held, and incorrectly implementing a plan for tapering of an antipsychotic medication.

Confirmation of Medication Orders

Order confirmation is completed by two nurses. The first nurse checks the order against the paper MAR or eMAR and indicates they have confirmed the order. As a result, the order appears on the eMAR. Another nurse then performs a second check of the orders against the MAR/eMAR in a timely manner, ideally within 24 hours. For telephone orders, order confirmation includes readback from the nurse and a process for prescribers to countersign telephone orders on their next visit to the home.

Examples of errors within this subtheme included inaccurate order transcription, missed discontinuation, missed hold of a medication for pre-op procedure, and missed or delayed order confirmation.



FIGURE 3. Typical steps for medication prescribing and order processing in the long-term care setting.

Medication Dispensing

Dispensing, which typically occurs at the pharmacy, is the process of preparing a resident's medications for administration.

Incident Example: *The prescribed dose for the intended resident was hydromorphone 0.5 mg. The pack dispensed contained a different strength tablet, was labelled incorrectly with the wrong resident's name and dose, and contained the wrong quantity.*

Contributing factors for the theme of medication order processing included lack of awareness regarding nursing requirements for order confirmation, lack of CPOE, lack of seamless and timely communication regarding new medication orders, and lack of independent double checks for confirmation of order entry.

Recommendations for LTC Homes and Regulators

- Adopt CPOE systems to eliminate the need for handwritten prescriptions and transcription of prescriber orders into pharmacy systems.
- Implement integrated software systems to ensure a direct interface between the pharmacy service provider and the LTC home(s) they support.
- Create a policy regarding order entry confirmation, requiring two nurses independently confirm orders in a timely manner.

Recommendations for Nursing Teams

- Address any outstanding orders requiring confirmation prior to medication administration (e.g., medication pass) to ensure all orders have gone through the first and second nursing checks.

Recommendations for Pharmacy Service Providers

- When a medication dose is changed, inactivate or discontinue the previous prescription before the new prescription is entered.
- Ensure that individuals entering orders at the pharmacy have specialized education and experience on the various eMAR systems used by the LTC home(s) they support, including an appropriate understanding of how the orders will be displayed in the eMAR to support nurses in accurately implementing/administering the medication orders.
- Select eMAR providers that are integrated with pharmacy management software system to reduce the need for double order entry.

THEME: Communication

Communications about medications can break down at transitions of care, at shift changes, and during interactions with the resident/family, leading to medication errors that may cause significant harm. The analysis identified 2 key communication subthemes: incomplete medication reconciliation and poor communication related to medications with atypical dosing schedules.

Medication Reconciliation

The best possible medication history (BPMH) is the cornerstone of the medication reconciliation (MedRec) process. When completed accurately, errors and gaps related to communication of medication orders at transitions to and from the home can be minimized.¹⁰

Contributing factors, especially for re-admission to the home after hospital discharge,¹¹ included missing information from the transferring facility about the date of the most recent doses of medication received, misinterpretation of the hospital MAR or discharge

summary, use of only 1 source of information to create the BPMH, lack of resident/family engagement regarding medication changes or involvement in the BPMH interview, and lack of interoperability among EMRs in hospitals, LTC homes, and pharmacy service providers.

Medications with Atypical Dosing Schedules

This subtheme encompasses the lack of clear processes to communicate and document the correct administration and timing of medications with atypical dosing schedules, such as transdermal patches (e.g., every 72 hours) and injections (e.g., every 6 months). Errors included doses signed off but not given,¹² missed doses, too frequent administration, and missed removal of patches.

Incident Example: *A resident newly admitted to a LTC home received a dose of denosumab monthly for 3 months (recommended dosing is every 6 months).¹³ As a result, the resident experienced severe kidney injury and was admitted to hospital. The date of the resident's most recent dose, which had been given in the community less than a month before admission, was not obtained at the time of admission to LTC, and the drug was inexplicably available as ward stock in the home.*

A contributing factor identified in this incident included an incomplete medication reconciliation process upon admission to the home due to lack of accurate documentation of the previous dose and the date of the next dose on the BPMH and MAR/eMAR.¹⁴

Recommendations for Care Teams and/or Pharmacy Service Providers

- Use a systematic process to obtain the BPMH on admission/re-admission to LTC, using more than one source of information.¹⁵ Include indication of use for each medication and rationale for held or discontinued medications, where possible.
 - Interview the resident/family where possible, using the BPMH interview guide.¹⁶

- For new admissions or transfers, obtain and document the date of the most recent dose and the intended schedule for each medication, and verify this information with the pharmacy, hospital, or resident/family. Document the most recent dose in the MAR/eMAR to assist nurses in accurately understanding and implementing the medication order.
- Routinely audit the “medication administration record” report to identify any medications for which administration is not documented and follow up as required for potential omission of medication doses.
- At shift changes, communicate new orders, next doses, and medications missed to oncoming nursing staff. Consider using an evidence-informed checklist, medical record handoff tool or develop a Transfer of Accountability (TOA) tool/checklist to aid in shift change communication.¹⁷

Recommendations for LTC Homes and/or Pharmacy Service Providers

- Consider removing from ward stock any medications that are meant to be given on atypical dosing schedules with lengthy intervals.

Recommendations for EMR System and/or Pharmacy Software Vendors

- Establish default settings (e.g., directions for use) in order-entry systems that provide the recommended frequency for medications with atypical schedules (e.g., every 6 months).
- Implement auto-calculation of next dose based on documentation of the most recent dose administered and the intended dosing interval.
- Create alerts in pharmacy systems and eMARs to flag potential errors in order entry, administration, or dispensing of high-alert medications with atypical schedules.¹⁸

THEME:
Resident and Family Roles

Resident and Family Engagement

Residents and their families play a key role in detecting potential errors. They should be engaged in the medication administration process and encouraged to ask questions.¹⁹ For example, asking questions if they do not recognize the medication offered or if their family member experiences adverse effects and/or a sudden change in condition.

***Incident Example:** A resident questioned staff about a glass of water they were given, as it had an unusual taste. Investigation revealed that the glass, which contained water mixed with a medication, had been intended for another resident.*

**Recommendations for
Prescribers and Nursing Teams**

- Discuss new medications with the resident and/or substitute decision maker (SDM); share the name of the medication and the indication for its use, and provide an updated medication list and written information upon request.
- Engage each resident and their family members to be active partners in the resident's own care.²⁰ Ensure that everyone has an opportunity to ask questions and raise concerns.
- When residents or family members report that a medication error has occurred, assess the resident for any untoward effects and gather relevant facts. If it is confirmed that a medication error has occurred, be transparent about what happened and apologize to the resident and the family.²¹

CONCLUSION

Medication incident reporting by staff and residents/families is an essential component of continuous learning and quality improvement in all LTC homes. This analysis of medication incident and near miss reports in Ontario LTC homes provides valuable insights into the risks and vulnerabilities of the medication management systems in this sector.

Recommendations are shared to inform targeted strategies for strengthening medication processes related to resident identification, medication order processing, communication, and resident and family engagement. ISMP Canada continues to support LTC homes in Ontario through the *Strengthening Medication Safety in Long-Term Care* initiative (<https://ismpcanada.ca/resource/ltc/>). Individuals and organizations across Canada may also access the online initiative resources and tools.

To inform future pan-Canadian reporting and learning, [staff](#) and [residents/families](#) in LTC settings are invited to share medication incident reports with ISMP Canada.

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The Canadian Medication Incident Reporting and Prevention System (CMIRPS) is a collaborative pan-Canadian program of Health Canada, the Canadian Institute for Health Information (CIHI), the Institute for Safe Medication Practices Canada (ISMP Canada) and Healthcare Excellence Canada (HEC). The goal of CMIRPS is to reduce and prevent harmful medication incidents in Canada.

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