

# ISMP Canada Safety Bulletin

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## Analysis of Incidents Involving Oral Chemotherapy Agents

The past few years have seen the introduction of many oral chemotherapy agents.<sup>1,2</sup> These agents can be self-administered at home, allowing for increased convenience relative to parenteral therapy administered in a specialized oncology setting. However, home therapy also transfers responsibility for the management and monitoring of chemotherapy regimens to patients, their caregivers, and healthcare professionals who may not have the appropriate training to take on these new tasks.<sup>1,3</sup> A multi-incident analysis of medication incidents involving oral chemotherapy agents was performed to better understand the challenges encountered by healthcare professionals who care for patients taking these medications. This bulletin shares the findings of the analysis and, by highlighting the major findings, identifies opportunities for system-based improvements.

### Methodology

Reports of incidents involving oral chemotherapy were extracted from the ISMP Canada medication incident database and the National System for Incident Reporting (NSIR)\* database.<sup>4,5</sup> The data reviewed for this analysis spanned the periods from July 2002 to April 2014 for the ISMP Canada database and from April 2009 to April 2014 for the NSIR database. A total of 516 incidents were analyzed using the multi-incident analysis technique outlined in the Canadian Incident Analysis

Framework.<sup>6</sup> Table 1 breaks down the incidents by severity of harm.

**Table 1:** Reported Severity of Outcomes of Oral Chemotherapy-Related Medication Incidents

	ISMP Canada	NSIR
No error†	181	14
No harm	256	46
Harm	15	0
Death	4	0
<b>Total</b>	<b>456</b>	<b>60</b>

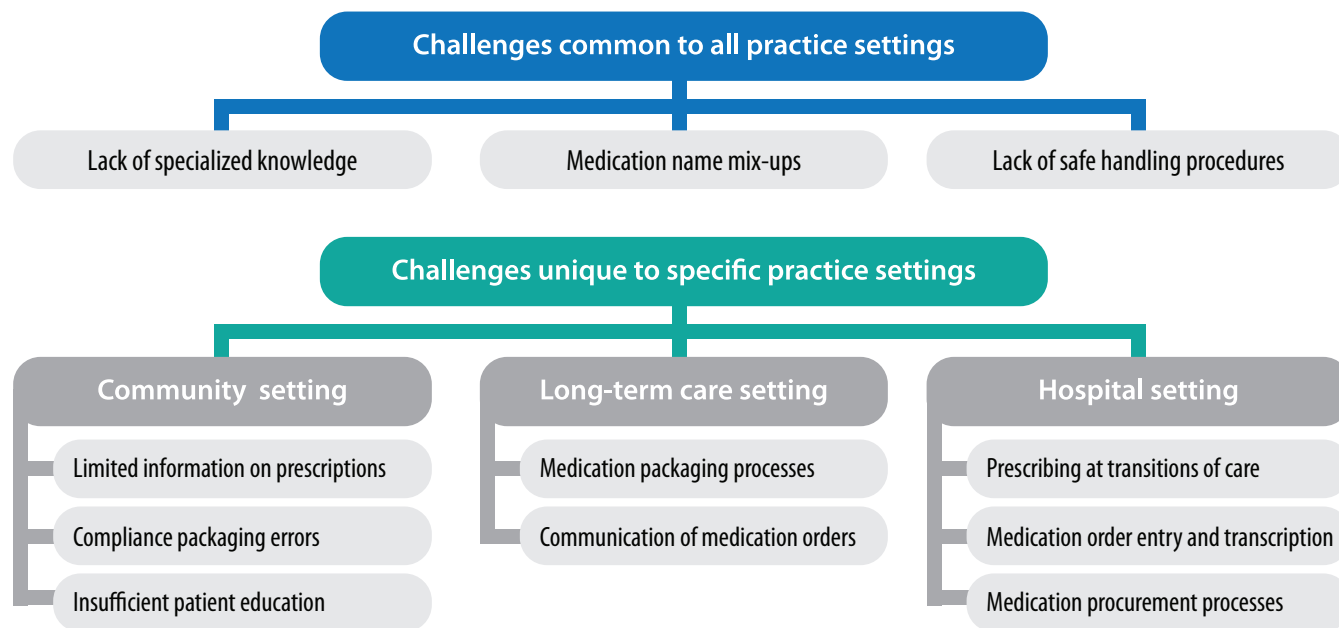
† “No error” is defined as a circumstance or event that has the capacity to cause harm for ISMP Canada data<sup>7</sup> and as a reportable circumstance or near miss for the NSIR.<sup>8</sup> “No error” incidents do not reach the patient, which differs from “No harm” incidents which do reach the patient.<sup>7,8</sup>

### Findings of the Multi-Incident Analysis

Analysis of the incidents identified a number of challenges faced by healthcare professionals (see Figure 1). Details about 3 themes especially relevant to the management of oral chemotherapy agents in all practice settings, including potential contributing factors, are described below. Some challenges unique to specific practice settings are highlighted in the discussion of these 3 themes. Selected examples from the ISMP Canada database are provided.

\* The NSIR, provided by the Canadian Institute for Health Information, is a component of the Canadian Medication Incident Reporting and Prevention System (CMIRPS) program. More information about the NSIR is available from: <http://www.cmirps-scdpim.ca/?p=12>

**Figure 1: Challenges Related to Medication Incidents, Grouped by Practice Setting**



**Theme: Lack of Specialized Knowledge**

Reported incidents demonstrated that a lack of specialized knowledge and/or oncology expertise among healthcare providers contributed to an increased risk of medication errors. Similarly, a recent survey found that many Canadian community pharmacists lack the appropriate expertise, including an understanding of chemotherapy cycles and side-effect profiles, to provide sufficient education to patients about correct administration and monitoring for adverse effects.<sup>1</sup> If such education is not provided by other members of the healthcare team, the patient may be unable to carry out the care plan or to recognize early signs of toxicity.

***Subtheme for the Community Setting: Limited Information on Prescriptions***

Limited information on prescriptions was a key factor contributing to errors in community pharmacies. Healthcare professionals without the appropriate expertise may not recognize that critical information, such as the diagnosis, the patient’s height and weight, and the duration of the chemotherapy cycle, is necessary to verify indication-specific dose ranges and schedules.<sup>2</sup>

***Incident example:***

A patient was receiving capecitabine according to a cyclical dosing regimen, as per a defined protocol. When the patient was admitted to hospital, the capecitabine was mistakenly ordered to be given daily. After the hospital stay, the discharge prescription also specified that the capecitabine be taken daily. The error was discovered by the oncologist 1 week after discharge. The care team’s lack of familiarity with the oral chemotherapy regimen may have contributed to this error.

**Theme: Medication Name Mix-Ups**

Confusion between drug names resulted in a number of incidents that were included in the analysis; look-alike or sound-alike drug names were a key contributing factor (see Table 2). Duplication of therapy secondary to lack of familiarity with brand and generic names for oral chemotherapy agents played a role in other incidents.

ISMP Canada is currently reviewing confusable drug name pairs, including many pairs involving oral chemotherapeutic agents, for potential application of TALLman lettering as a strategy to aid in

differentiation. This work builds upon a previous collaboration on TALLman lettering between ISMP Canada and the Canadian Association of Provincial Cancer Agencies (CAPCA).<sup>9</sup>

**Table 2:** Examples of Common Medication Name Mix-Ups

<b>Between brand names</b>
Androcur (cyproterone) and Andriol (testosterone) Casodex (bicalutamide) and Cozaar (losartan) Nexavar (sorafenib) and Nexium (esomeprazole)
<b>Between brand and generic names</b>
tamoxifen and Tamiflu (oseltamivir) tamoxifen and Tecta (pantoprazole) Temodal (temozolomide) and tramadol
<b>Between generic names</b>
cyclophosphamide and cyclosporine flutamide and fluticasone hydroxyurea and hydroxyzine procarbazine and carbamazepine

Contributing factors to errors with look-alike names included limited information on prescriptions and limited use of extra checks. ISMP Canada has recommended stating the indication for the drug on all prescriptions. Including both the generic and brand names can help to prevent medication errors involving look-alike names. Use of barcoding technology can also provide an extra safety check.

### **Theme: Lack of Safe Handling Procedures**

Oral and parenteral chemotherapy agents are hazardous substances. The use of standardized handling processes and appropriate warning labels can help to minimize the risk of harm. Such processes include the use of designated devices and personal protective equipment during medication preparation, dispensing, and administration, to protect both

healthcare providers and patients from inadvertent exposure to these hazardous medications. However, practitioners and patients are often unfamiliar with the handling safeguards required for these medications.

#### ***Incident example:***

A pharmacist dispensed Diclectin (a combination of pyridoxine and doxylamine used to treat nausea and vomiting in pregnancy) using the same counting tray that had been used earlier to fill a prescription for hydroxyurea, without properly cleaning the tray between prescriptions. The pharmacist contacted the patient with instructions to replace the Diclectin before any doses were taken.

#### ***Subtheme for the Long-Term Care Setting: Medication Packaging Processes***

The use of packaging technology, particularly in the institutional setting, increases dispensing efficiency and accuracy. However, staff involved in the packaging process must be made aware that oral chemotherapy agents are not to be packaged with these machines, as doing so will result in equipment contamination.<sup>10</sup> In addition, errors related to filling a drug canister with the incorrect medication can be very difficult to detect and may potentially affect a large number of patients.

#### ***Incident example:***

A resident received hydroxyurea 500 mg instead of hydroxyzine 25 mg because the wrong drug had been stocked in an automated strip-packaging machine. This error resulted in mislabelling of the medication, an error that was not caught during the dispensing process.

#### ***Subtheme for the Hospital Setting: Medication Procurement Processes***

Despite established processes to safely manage oral chemotherapeutic agents in facilities, the use of a patient's own supply can potentially bypass many key safeguards (e.g., product verification, use of warning labels, monitoring for drug interactions).

### ***Incident example:***

A patient's own supply of dasatinib was used during a hospital admission. Staff members caring for the patient were not notified to take the necessary precautions for handling the medication safely.

### **Conclusion**

Attention to the safe management of oral chemotherapy agents must increase as their use grows.<sup>11</sup> Properties such as narrow therapeutic index, the serious and potentially fatal consequences that can result from adverse effects or dosing errors, and inadvertent environmental exposure mean that the use of these agents is associated with a higher inherent risk of harm than the use of most other oral

medications. This multi-incident analysis identified many challenges related to the use of oral chemotherapy agents in various healthcare settings. Organizations and practitioners are encouraged to use these findings to build and share system safeguards aimed at reducing the risk of medication errors related to oral chemotherapy. ISMP Canada has been working with CAPCA to develop oral chemotherapy guidelines. This collaborative is supported by every provincial cancer agency and program in Canada. The new document will provide guidance for the physicians, pharmacists, and nurses who care for patients receiving oral chemotherapy agents.

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*This segment of the bulletin describes a recent SafeMedicationUse.ca publication from ISMP Canada's Consumer Program.*

March 2015 - Newsletter:

## Caution: Not All Medications Are Taken Every Day

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SafeMedicationUse.ca received a report about an older adult who took the osteoporosis medication risedronate daily, instead of weekly as prescribed, because the consumer mistook the risedronate for another medication that was to be taken daily. This error was discovered at the pharmacy when the consumer requested a refill of the risedronate much earlier than expected.

Fortunately, no harm came to the consumer in this case. However, the result might have been different if the error had continued for longer or if the error had involved a medication that carried more risk of harm from adverse effects or overdose.

### Tips for Practitioners:

- **Investigate the reasons for early refill requests.** Has there been a change in therapy? Is the consumer going on vacation? Might the consumer be taking the medication incorrectly?
- **Review medications with unusual dosing schedules** with the consumer.
- **Ask consumers to bring their medication vials** when coming for a medication review. Having the vials on hand will help you to ensure that the medications are in appropriately labelled bottles or compliance packaging and that the consumers are taking them correctly.

### Tips to Share with Consumers:

- Suggest that the consumer **review details of any new medications (name, strength, and dosing schedule) with both the prescriber and the pharmacist.**
- Recommend that the consumer **use a calendar to keep track of medications that are not taken every day.**
- If the consumer is having difficulty managing the dosing schedules for different medications, suggest that the consumer **speak to a pharmacist about having the medications prepared in a blister pack or about obtaining a pill organizer (dosette).**
- **Help the consumer identify ways to tell apart the medications** that are not taken every day. For example:
  - Mark each medication vial with a different colour.
  - Store different medications in separate locations (or in separate bins in the same location) to prevent a mix-up.
- Suggest that the consumer **speak to a pharmacist to determine eligibility for a medication review.**

For additional recommendations for both consumers and practitioners, read the complete newsletter at: [http://www.safemedicationuse.ca/newsletter/newsletter\\_NotAllMedicinesTakenEveryDay.html](http://www.safemedicationuse.ca/newsletter/newsletter_NotAllMedicinesTakenEveryDay.html)



Consumers Can Help Prevent  
Harmful Medication Incidents

SafeMedicationUse.ca

## Computerized Prescriber Order Entry for Systemic Treatment: Best Practice Guideline to Support the Safe Delivery of Chemotherapy

In 2012, Cancer Care Ontario released its best practice guideline on Computerized Prescriber Order Entry (CPOE) for Systemic Treatment. This guideline for systemic chemotherapy focuses on the order-entry phase of the medication-use system. The guideline provides evidence-based recommendations and guidance on the design, selection, implementation, and/or evaluation of CPOE systems that support the delivery of safe, high-quality systemic chemotherapy through their key features, functionalities, and components. Healthcare team members such as physicians, pharmacists and nurses as well as those in clinical informatics, health technology and decision support can use this guideline to optimize safe clinical practices and to create an efficient process flow.

The full guideline is available from Cancer Care Ontario at:  
<https://www.cancercare.on.ca/common/pages/UserFile.aspx?fileId=251835>



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 the Canadian Patient Safety Institute (CPSI). The goal of CMIRPS is to reduce and prevent harmful medication incidents in Canada.



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



The Institute for Safe Medication Practices Canada (ISMP Canada) is an independent national not-for-profit organization committed to the advancement of medication safety in all healthcare settings. ISMP Canada's mandate includes analyzing medication incidents, making recommendations for the prevention of harmful medication incidents, and facilitating quality improvement initiatives.

## Report Medication Incidents

(Including near misses)

**Online:** [www.ismp-canada.org/err\\_index.htm](http://www.ismp-canada.org/err_index.htm)

**Phone:** 1-866-544-7672

ISMP Canada strives to ensure confidentiality and security of information received, and respects the wishes of the reporter as to the level of detail to be included in publications. Medication Safety bulletins contribute to Global Patient Safety Alerts.

## Stay Informed

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This bulletin shares information about safe medication practices, is noncommercial, and is therefore exempt from Canadian anti-spam legislation.

## Contact Us

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