

ISMP Canada Safety Bulletin

Volume 21 • Issue 7 • June 30, 2021

Balancing Safety and Efficiency in Community Pharmacy

Efforts to address the high workload and multifaceted nature of patient care in community pharmacies may lead to prescription processing practices that can put patient safety at risk.¹⁻⁵ This bulletin highlights the findings from a multi-incident analysis of errors reported in the community pharmacy setting and identifies opportunities for process improvements.

METHODOLOGY

Medication incidents submitted between March 2017 and June 2019 with a setting of “community pharmacy” were extracted from 3 ISMP Canada voluntary reporting databases* (National Incident Data Repository for Community Pharmacies,[†] Consumer Reporting, and Individual Practitioner Reporting). The search included key terms commonly used to describe problematic practices in the community pharmacy setting, including “circumvent”, “workaround”, “shortcut”, and “copy-over”. Of the 192 incidents identified, 94 were included in the analysis. The analysis was conducted according to the multi-incident analysis methodology outlined in the Canadian Incident Analysis Framework.⁶

FINDINGS

The analysis identified 6 areas where measures intended to expedite prescription processing

contributed to medication incidents. These measures can be grouped within 3 stages of prescription processing in community pharmacies: order entry, filling, and pickup (Figure 1).

Figure 1. Problematic processes grouped by prescription processing stage – order entry, filling, and pickup.

Prescription Order Entry



- Copying a previous prescription file
- Delay in patient profile updates

Prescription Filling



- Inadequate management of medication changes with compliance packaging
- Repeat scanning of one item's bar code to represent multiple items

Prescription Pickup



- Inadequate patient identification
- Lack of dialogue with patients

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

† For more information on community pharmacy incident reporting, see National Incident Data Repository for Community Pharmacies (NIDR): <https://www.ismp-canada.org/CommunityPharmacy/NIDR/NIDR-faq.pdf>

PRESCRIPTION ORDER ENTRY

Prescription intake encompasses receipt of prescriptions from patients or prescribers, as well as entry of prescription information into the pharmacy software system. Order entry is completed by a member of the pharmacy team and the information is verified for accuracy.

Copying a Previous Prescription File

When entering a new prescription into the patient's electronic profile, an existing prescription for the same medication can be copied, with the intention of changing fields as required to reflect details of the new prescription. During training, employees are often taught how to use the copy function to expedite prescription processing.

Incident Example

A new prescription for methylphenidate 20 mg was entered by copying the patient's previous prescription record for methylphenidate 10 mg. The pharmacy staff member entering the prescription overlooked changing the strength field from 10 mg to 20 mg, resulting in the patient receiving half the intended dose.



TIP: Safe practice is to create a new entry for all new prescriptions and limit the copy function to new prescriptions that are unchanged from the previous prescription in the patient's profile.

Delay in Patient Profile Updates

When presented with a prescription for a current medication with a different strength or altered directions for use, or for a different drug for the same indication, the pharmacy team may focus on filling the new prescription right away. Workload and time constraints may then delay inactivation of previous prescription(s) in the patient's profile.⁷ When discontinued prescriptions remain on the profile (and are displayed as "active"), these can inadvertently be dispensed, resulting in medication errors (i.e., duplicate therapy) and possible patient harm.

Incident Example

A new prescription for a beta-blocker included a note to discontinue the patient's current beta-blocker. However, the prescription for the beta-blocker on file was not discontinued or inactivated. The prescription for the previous beta-blocker was refilled soon after the new one was dispensed. The concomitant ingestion of both beta-blockers was reported to have contributed to the patient's death.



TIP: Update the patient's medication profile during clinical verification, either before or immediately after order entry.

PRESCRIPTION FILLING

Prescription filling involves retrieving the medication, preparing the quantity required for the prescription, packaging the medication in a suitable container (e.g., vial, bottle, or compliance package), and labelling the container.

Inadequate Management of Medication Changes with Compliance Packaging

The preparation of compliance packages (or blister packs) is complex, involving multiple steps and, potentially, several pharmacy team members, and is often completed in advance. The analysis identified numerous reports where midcycle changes to a patient's medication regimen (i.e., before the patient's next blister pack was due to be prepared) contributed to medication errors.

Incident Example

A patient, who was partway through a blister pack, had the dose of one medication changed from 2 tablets daily to 3 tablets daily. A vial containing tablets of this medication, labelled with the new instructions, was given to the patient, to be taken during the interval until the next blister pack was prepared. The patient misunderstood the instructions, and took 3 tablets daily from the vial, in addition to the 2 tablets in the blister pack, which resulted in a total daily dose of 5 tablets.



TIP: When possible, repackage the existing blister pack to reflect the modified regimen. Alternatively, collaborate with the prescriber to determine whether a medication change can be initiated with the next blister pack to be dispensed.

Repeat Scanning of One Item's Bar Code to Represent Multiple Items

Workarounds intended to expedite the filling process bypass the intended safety advantage of bar-code scanning.^{8,9} An example of a common workaround is scanning the bar code on 1 item multiple times, rather than scanning the bar code on each item separately, when more than 1 package of a medication is needed to fill a single prescription.

Incident Example

When filling a prescription that required 3 boxes of medication, a pharmacy team member scanned the bar code on a single box 3 times, instead of scanning each box separately. The boxes were then taped together, with 1 label affixed to the 3-box package. Fortunately, during the visual product check, the pharmacist identified that 1 of the boxes contained the wrong strength of the medication.



TIP: Scan the bar code of each box or stock bottle that is used to fill a prescription.



TIP: Configure pharmacy software to automatically print multiple labels if multiple containers are being dispensed. Check for accuracy before labelling each container.

PRESCRIPTION PICKUP

Prescription pickup refers to the act of transferring the filled prescription from the pharmacy to the patient. This last stage of prescription processing offers an opportunity for a final check to detect and prevent any medication errors from reaching the patient.

Inadequate Patient Identification

Pharmacies should follow strict procedures for patient identification at pickup, such as asking for 2 patient identifiers and having the patient and pharmacy staff member double-check the containers in the bag together before leaving the pharmacy.⁵ Of particular concern for example, inadequate patient identification processes led to several “wrong patient” errors associated with opioid agonist therapy (e.g., methadone, buprenorphine-naloxone).

Incident Example

A patient picking up a prescription confirmed the last name and provided a nickname as their first name. The pharmacy staff did not request a second patient identifier, and as a result, the patient left the pharmacy with another patient's prescriptions.



TIP: Request a minimum of 2 patient identifiers at prescription pickup. Preferred identifiers, in addition to the patient's name, include the person's address and date of birth.



TIP: At pickup, open the bag containing the prescriptions and review the medications with the patient, ensuring that each prescription label bears the intended patient's name.

Lack of Dialogue with Patients

Patients should receive counselling about all new prescriptions, including those with a change in dose or directions for use. Many pharmacies have systems in place to alert pharmacists to prescriptions that require discussion with the patient; however, factors such as interruptions or high workload may result in these alerts being overlooked.³

Incident Example

A patient who was taking warfarin received new prescriptions for 2 antibiotics that had the potential to increase the effect of the anticoagulant. The pharmacist did not communicate to the patient's agent (who picked up the prescriptions) the need for

more frequent bloodwork monitoring to mitigate the risk of bleeding. The patient was later hospitalized because of severe bleeding.



TIP: Identify and document discussion points (e.g., on the prescription hard copy) during the verification process. Attach the documentation to the filled prescription as an alert for the pharmacist to engage in patient dialogue before the prescription is released.



TIP: Consider the use of technology to support virtual communication with patients when they are unable to pick up the prescriptions themselves.

CONCLUSION

The complex demands of patient care and the often high-pressure practice environment are key considerations when designing workflow in community pharmacies to ensure that processes and systems do not compromise patient safety.^{2,3,5} Learning from the analysis of these errors is shared to help pharmacy teams better understand the potential risks associated with problematic processes and to encourage consideration of how various technologies and available resources can be better utilized to optimize efficiency and safety.

ACKNOWLEDGEMENTS

ISMP Canada gratefully acknowledges expert review of this bulletin by the following individuals (in alphabetical order):

Jennifer Antunes RPhT, Sunnybrook Health Sciences Centre, Toronto, ON; Jeannette Sandiford BSP, Assistant Registrar, Saskatchewan College of Pharmacy Professionals, Regina, SK; Nabila Tabassum RPh BScPhm PharmD, Staff Pharmacist, Shoppers Drug Mart, Toronto, ON.

REFERENCES

1. Jacobs S, Johnson S, Hassell K. Managing workplace stress in community pharmacy organisations: lessons from a review of the wider stress management and prevention literature. *Int J Pharm Pract.* 2018;26(1):28-38.
2. Rajah R, Hanif AA, Tan SSA, Lim PP, Karim SA, Othman E, et al. Contributing factors to outpatient pharmacy near miss errors: a Malaysian prospective multi center study. *Int J Clin Pharm.* 2019;41(1):237-243.
3. Weir NM, Newham R, Bennie M. A literature review of human factors and ergonomics within the pharmacy dispensing process. *Res Social Adm Pharm.* 2020;16(5):637-645.
4. Dillon P, McDowell R, Smith SM, Gallagher P, Cousins G. Determinants of intentions to monitor antihypertensive medication adherence in Irish community pharmacy: a factorial survey. *BMC Fam Pract.* 2019;20:Article 131
5. Thomas CEL, Phipps DL, Ashcroft DM. When procedures meet practice in community pharmacies: qualitative insights from pharmacists and pharmacy support staff. *BMJ Open.* 2016;6(6):e010851.
6. Incident Analysis Collaborating Parties. Canadian incident analysis framework. Edmonton (AB): Canadian Patient Safety Institute; 2012 [cited 2020 Feb 18]. Available from: <https://www.patientsafetyinstitute.ca/en/toolsResources/IncidentAnalysis/Documents/Canadian%20Incident%20Analysis%20Framework.PDF>. The Incident Analysis Collaborating Parties are Canadian Patient Safety Institute (CPSI), Institute for Safe Medication Practices Canada, Saskatchewan Health, Patients for Patient Safety Canada (a patient-led program of CPSI), Paula Beard, Carolyn E. Hoffman, and Micheline Ste-Marie.
7. Stojković T, Rose O, Woltersdorf R, Marinković V, Manser T, Jaehde U. Prospective systemic risk analysis of the dispensing process in German community pharmacies. *Int J Health Plann Manage.* 2018;33(1):e320-e332.
8. Institute for Safe Medication Practices. Maximizing the value of bar code scanning in community pharmacies. *Pharm Today.* 2014;20(6):76.
9. van der Veen W, van den Bempt PMLA, Wouters H, Bates DW, Twisk JWR, de Gier JJ, et al. Association between workarounds and medication administration errors in bar-code-assisted medication administration in hospitals. *J Am Med Inform Assoc.* 2018;25(4):385-392.

Cephalosporin Substitution Errors: A Collaborative Analysis with CIHI

Recommendations

- *Require users to input at least 4 letters during electronic product selection before options are displayed^{1,2}*
- *Incorporate the indication when prescribing*
- *Use bar coding throughout the medication use process*

Antibiotic stewardship and antibiotic safety are areas of great interest. With this interest in mind, the teams at the Canadian Institute for Health Information's National System for Incident Reporting (NSIR) and ISMP Canada collaborated to examine their respective national incident reporting databases. The BC Patient Safety & Learning System team provided valuable assistance with verifying the BC NSIR data. Select findings of the analyses conducted are shared here.

Methodology

Review of antibiotic incidents reported to NSIR between 2008 and 2020 showed that the most common types of errors were similar across different classes of antibiotics. However, errors involving cephalosporins (which accounted for 30% of all antibiotic incidents), were twice as likely to be "wrong drug" errors, relative to errors with other types of antibiotics.

With these findings in mind, ISMP Canada conducted a multi-incident analysis of data (for incidents reported between April 1, 2010, and Nov. 13, 2020) from its 3 reporting databases and from the NSIR to better understand the contributing factors leading to cephalosporin substitution errors. After initial review of more than 3700 reports, 464 and 395 incidents remained for analysis from the ISMP Canada databases and the NSIR, respectively.

Quantitative Findings

Approximately 70% of reports involved mix-ups between different cephalosporins, although there were also substitution errors involving non-cephalosporin antimicrobials. Table 1 shows the top 3 pairs involved in substitution errors. Harm was reported in 3.5% of the incidents.

Qualitative Findings

The presence of look-alike, sound-alike prefixes ("ceph" or "cef") was identified as a key contributing factor across all the identified themes. Other contributing factors include the similarities in the doses prescribed and available product strengths and concentrations (e.g., 1 g vials are available for both ceftriaxone and cefazolin). More specifically, for the cefprozil and cefuroxime pair, look-alike sound-alike brand names (Cefzil and Ceftin) factored in the substitution errors.

Conclusion

Cephalosporins are often substituted for one another in error. Although only a small percentage of reported cases resulted in harm (which was to be expected, given the similar adverse effect profiles of the substituted drugs), the longer-term effects and costs resulting from delays in treatment with the correct antibiotic are unknown.

References

1. Understanding Human Over-Reliance on Technology. Horsham (PA): ISMP. 2016 Sep 8 [cited 2021 Jun 22]. Available from: [Understanding Human Over-Reliance on Technology \(ismp.org\)](https://www.ismp.org/Understanding-Human-Over-Reliance-on-Technology)
2. Fatal medication errors can result when drug entry fields populate after only a few letters. Plymouth Meeting (PA): ECRI. 2021 Jan 28 [cited 2021 Jun 22]. Available from (subscription required): [Fatal Medication Errors Can Result When Drug Entry Fields Populate After Only a Few Letters \(ecri.org\)](https://www.ecri.org/Fatal-Medication-Errors-Can-Result-When-Drug-Entry-Fields-Populate-After-Only-a-Few-Letters)

TABLE 1.

Top 3 Cephalosporin Pairs Subject to Mix-Ups

Common Intended Medication	Common Substituted Medication	% of Incidents (Regardless of Direction)
Cefazolin	Ceftriaxone	22%
Cefuroxime	Cephalexin	12.6%
Cefprozil	Cefuroxime	11.5%

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

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

To receive ISMP Canada Safety Bulletins and Newsletters visit:

www.ismp-canada.org/stayinformed/

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

Contact Us

Email: cmirps@ismpcanada.ca

Phone: 1-866-544-7672

©2021 Institute for Safe Medication Practices Canada.