REPORT TO THE

College of Pharmacists of Manitoba

Safety Improvement in Quality (Safety IQ)

Multi-Incident Analysis of Incidents Associated with Harm Reported by Community Pharmacies in Manitoba

October 2022

Institute for Safe Medication Practices Canada
Institut pour l'utilisation sécuritaire des médicaments du Canada

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A Key Partner in the Canadian Medication Incident Reporting and Prevention System

Un partenaire clé du Système canadien de déclaration et de prévention des incidents médicamenteux

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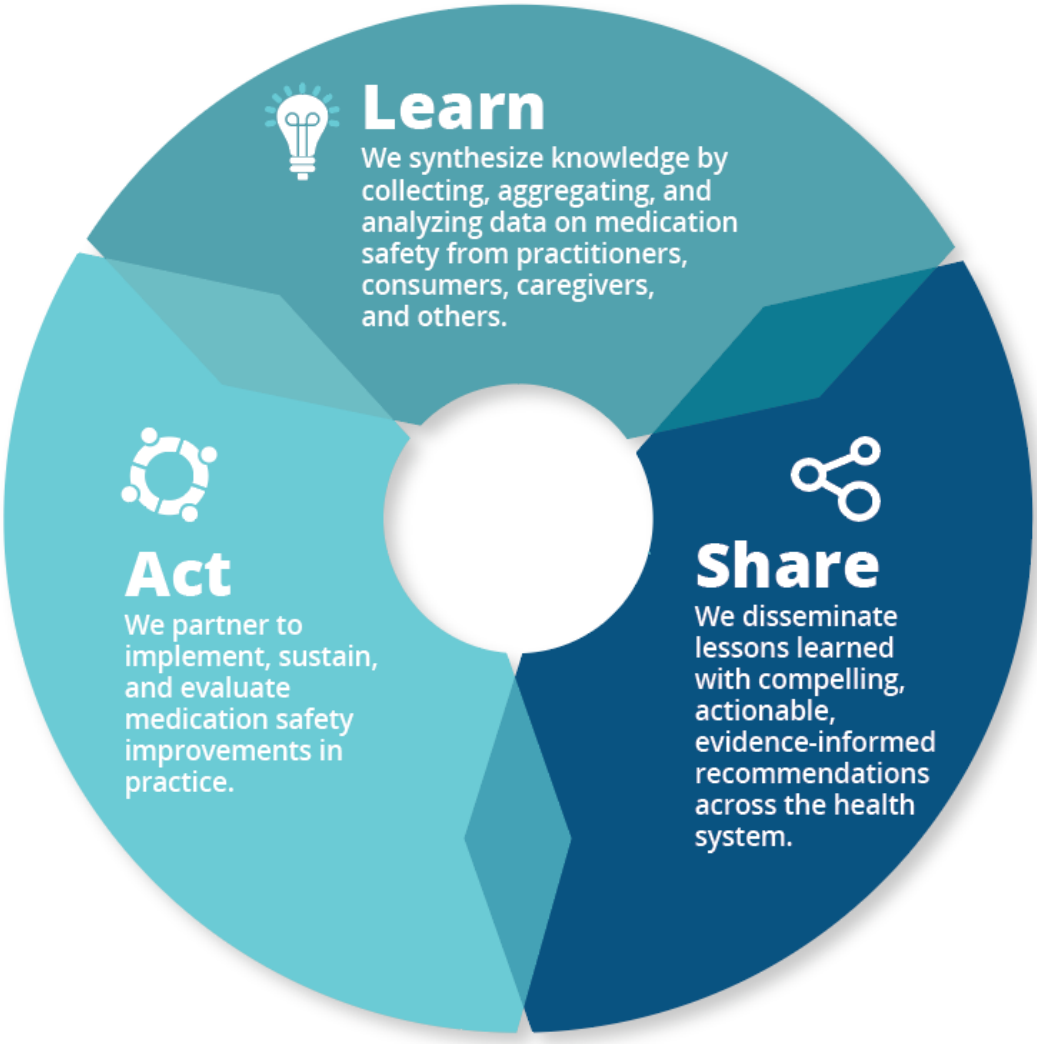

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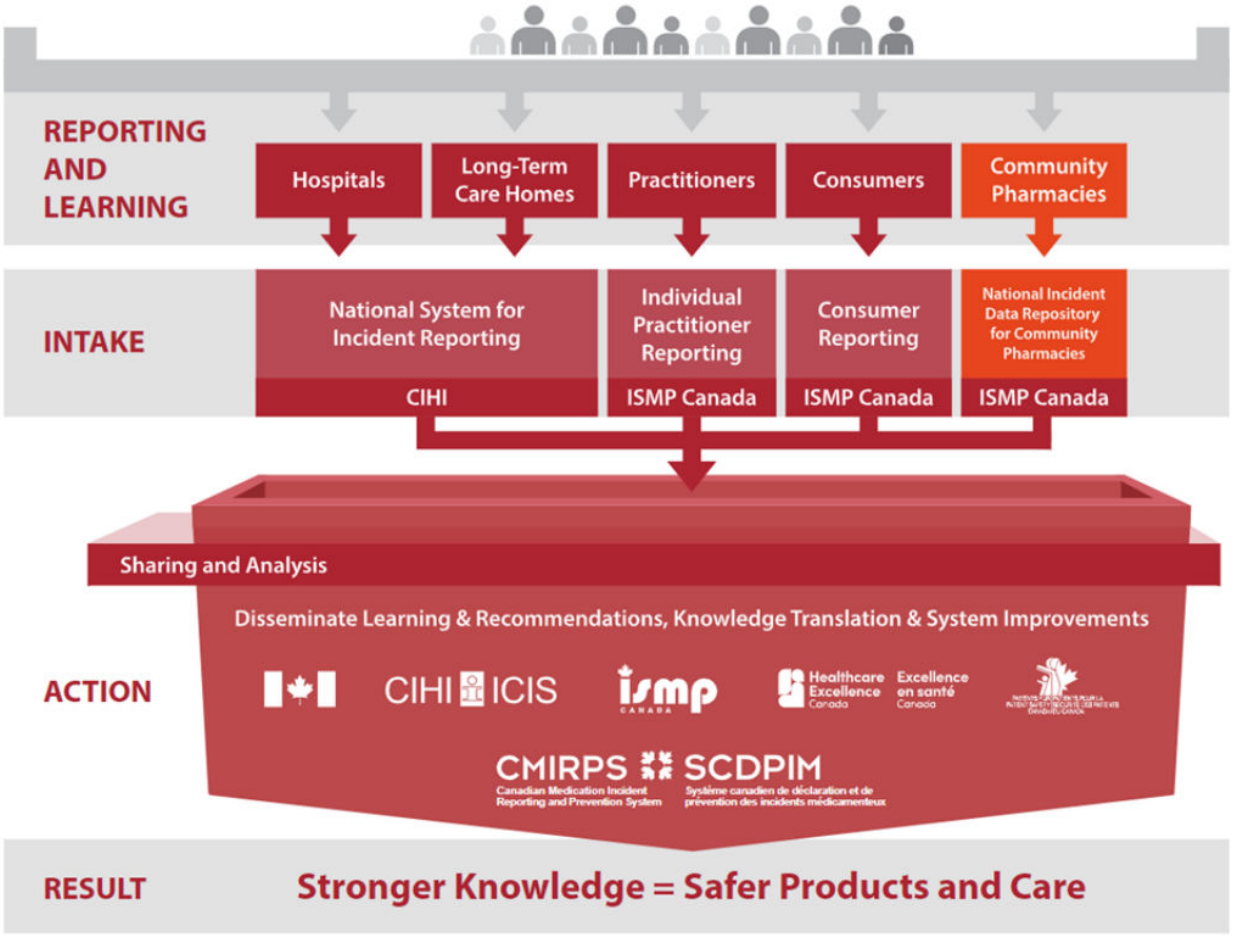
ISMP Canada's **National Incident Data Repository for Community Pharmacies (NIDR)** is a collection of reported medication incidents submitted anonymously by community pharmacies for the purpose of improving medication safety in the community and elsewhere.

Since inauguration, the NIDR has contributed to improvements in practice through shared learning, medication safety and quality improvements, as well as informing research and policy.



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Introduction

ISMP Canada's National Incident Data Repository for Community Pharmacies (NIDR) is a collection of reported medication incidents submitted anonymously by community pharmacies for the purpose of improving medication safety in the community and elsewhere. Since inauguration in 2008, the NIDR has contributed to improvements in practice through shared learning, medication safety and quality improvements, as well as informing research and policy.[1]

Currently, data sharing processes allow community pharmacies to anonymously report near misses and medication incidents to the NIDR using any incident reporting platform meeting the requirements of the respective jurisdiction.[1]

Safety Improvement in Quality (Safety IQ) is a mandatory, standardized continuous quality improvement (CQI) program for all community pharmacies in Manitoba. Elements of Safety IQ include reporting, analysis, documentation, and shared learning from medication incidents and near-miss events to improve patient safety.2,3 The submission of medication incident data to the NIDR is one component of this CQI program in Manitoba.

This report highlights key learnings and opportunities for safety improvement from an aggregate analysis of incidents associated with harm reported by community pharmacies in Manitoba.

Objectives

The objectives of this multi-incident analysis (MIA) are to gain a deeper understanding of the factors contributing to incidents associated with patient harm reported by community pharmacies in Manitoba, and to develop recommendations that will prevent error recurrence.

Methods

Incidents associated with harm reported by pharmacies in Manitoba were extracted from ISMP Canada's NIDR database. The incidents were retrieved from a five-year timeframe (April 1, 2017, to March 31, 2022). Of the 3898 incidents reported in that period, a total of 137 incidents (3.5%) were associated with harm and extracted for analysis.

Results & Discussion

QUANTITATIVE ANALYSIS

Of the 137 incidents included in the analysis, 124 incidents (90%) were reported to have caused mild harm, 11 (8%) caused moderate harm, 1 (1%) caused severe harm, and 1 (1%) was reported to have caused death (Figure 1).

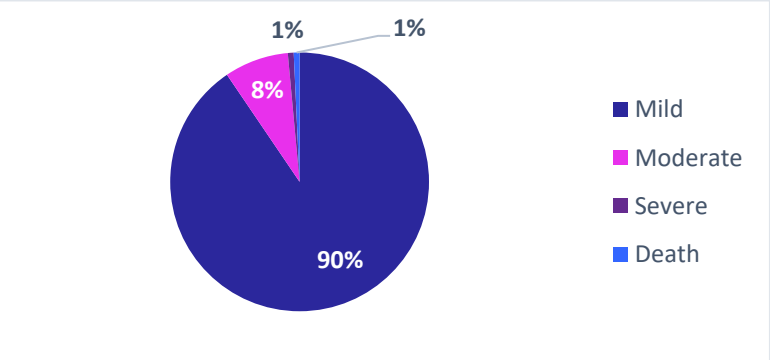

Figure 1. Percentage of reported incidents per level of harm

Dispensing and order entry were the most error-prone stages of the medication-use process, with 99 and 79 incidents reported, respectively (Figure 2). Given that these are the two stages that pharmacy staff are most responsible for, it stands to reason that they are more likely to be aware of errors to report.

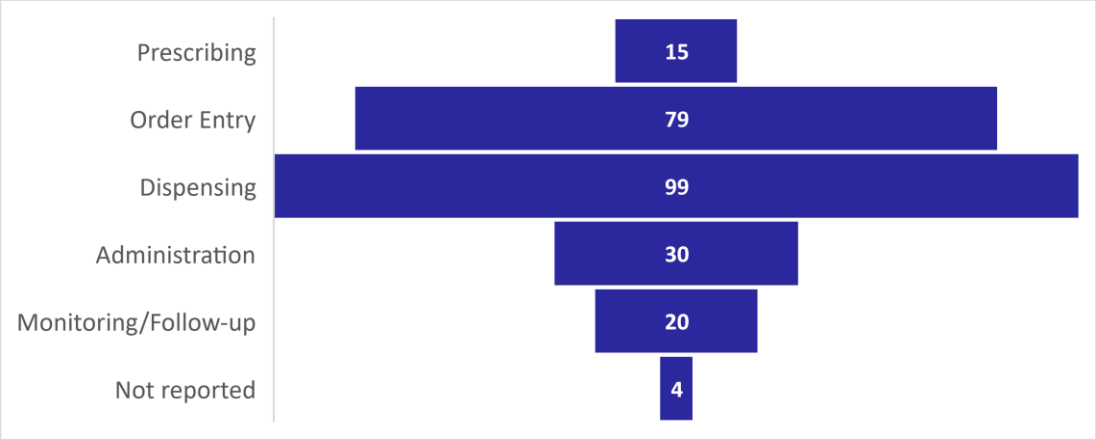

Figure 2. Number of reported incidents per stage of the medication-use process

An incorrect dose or frequency was reported in 33 incidents, an incorrect drug in 27 incidents, and an omitted medication in 19 incidents (Figure 3). The most common types of errors align with findings from Manitoba's NIDR Safety Brief, which analyzed all reported incidents, irrespective of harm.[4]

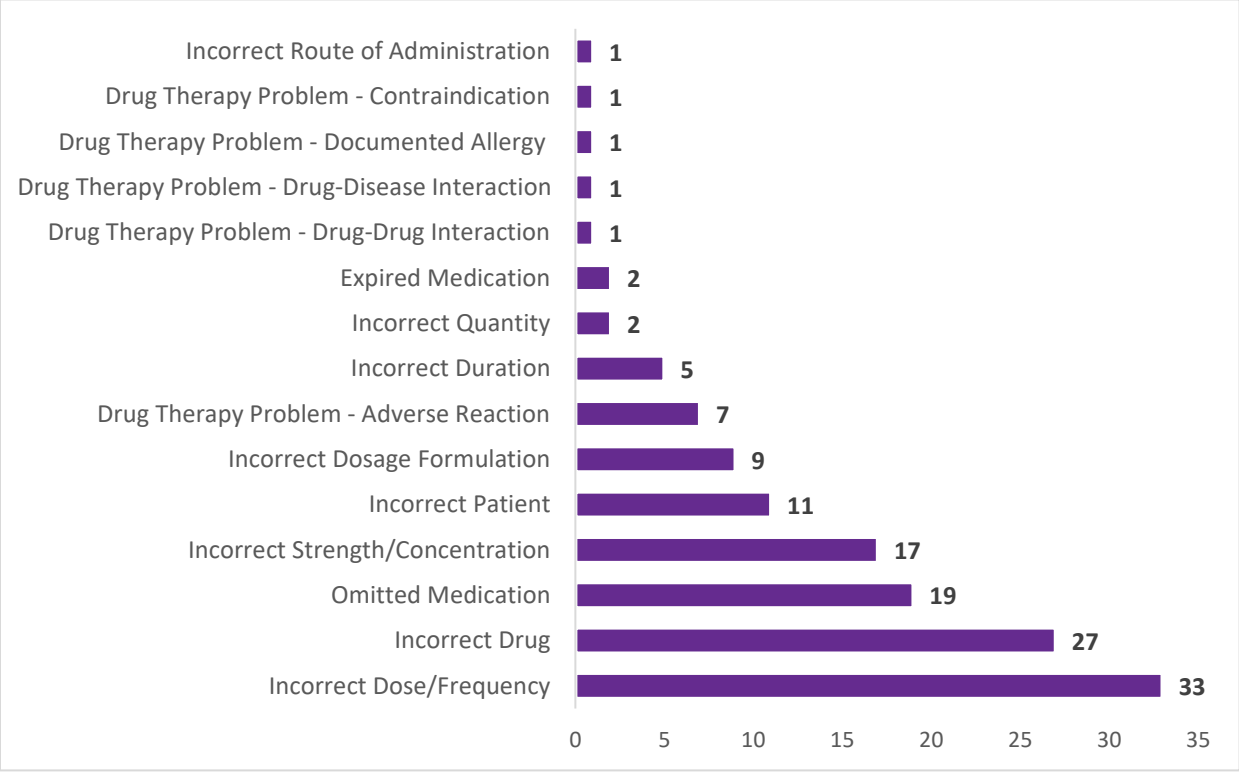

Figure 3. Number of reported incidents per type of error

The most commonly reported medication was metoprolol (n=6), followed by the Pfizer-BioNTech COVID-19 vaccine (n=5) and metformin (n=5).

QUALITATIVE ANALYSIS

The qualitative analysis of harm incidents reported by community pharmacies in Manitoba identified six themes, each with their own subthemes and potential contributing factors (Figure 4).

Figure 4. Overview of Themes and Subthemes

Theme 1: High-Risk Processes

Errors involving high-risk processes accounted for approximately 28% of all reported incidents. Subthemes identified were key areas of practice: compliance packaging, opioid agonist therapy, compounding, and vaccinations.

Compliance Packaging

Errors relating to compliance packaging were primarily reported in the following circumstances: when a new medication was added; when a medication dose was changed; when the patient had problems coordinating with additional medications separate from their compliance packs; or when there were insufficient medication refills.

The types of errors reported included dose omissions, incorrect medications, and mix-ups between medications within the compliance pack and those in separate vials.

> *Incident example: A patient received a new medication part-way through the compliance pack period. Since the patient was unable to bring the compliance pack in to be updated, a vial of the*

medication was delivered. When the next compliance pack was prepared, the addition of the new medication was missed.

Inadequate management of medication changes with compliance packaging was identified as key opportunity for improvement in a recent analysis.[5]

KEY RECOMMENDATIONS FOR SAFETY:

- Verify the printed compliance pack label (or medication administration record [MAR]) with the most up-to-date prescription for each medication.[6]
- Develop a standardized procedure to follow when a medication regimen is adjusted in the middle of the compliance pack cycle. This may include:
    - Make the change in the compliance pack label as soon as the new prescription is received. Set an alert in the system to remind staff of the change when the compliance pack is refilled.
    - When possible, repackage the existing compliance pack to reflect the modified regimen.[5] Alternatively, collaborate with the prescriber to determine whether a medication change can be initiated with the next compliance pack to be dispensed.[5]
    - Clearly communicate the dose change to the patient and caregiver using the repeat-back method. The change can also be highlighted on the compliance pack label to bring attention to it during administration.

  Conduct an independent double check[7] of the medications in the compliance pack against the compliance pack label and the medication stock bottles.

Opioid Agonist Therapy

The majority of incidents involving opioid agonist therapies occurred during dispensing and administration. Incidents were reported similarly for both methadone and buprenorphine-naloxone.

Incident example: A patient's dose of buprenorphine-naloxone was reduced. At the pharmacy, the previous, higher dose was inadvertently dispensed. The patient ingested the higher dose and only recognized the error after reading the dose on the label for the carries.

Methadone is a high-alert medication[8] as it continues to be one of the top medications reported to be associated with harm in community pharmacy incidents.[9]

KEY RECOMMENDATIONS FOR SAFETY:

- Develop a template for communication with the prescriber regarding dose changes, including clarification of the previous and current doses.
- Implement a policy to inactivate discontinued prescriptions on a patient's profile before, or immediately after, entering the new prescription.[5]
    - Create a copy of the new prescription for the log of witnessed and take-home doses[10] to allow for review prior to dispensing and/or administration.
      Start a new log with each new prescription.
- Using open-ended questions, ask the patient to state the expected medication and dose (e.g., "What is the name of your medication?" "What dose are you on?"). Repeat the medication name and dose back to the patient for confirmation before providing opioid agonist therapy and witnessing its ingestion.[11]

Compounding

Compounding-related incidents involved calculation errors and overlooking unique patient requests. A lack of independent double checks and standardized procedures potentially contributed to these incidents.

> *Incident example: A topical hormone product was compounded for the patient at 10 times the intended concentration. The patient experienced some side effects, and the hormone levels needed to be reassessed by the physician.*

Most pharmacies provide some compounding services. However, the scope of such services and the complexity of products compounded are highly variable.[12]

> **KEY RECOMMENDATIONS FOR SAFETY:**

- Ensure easy access to the prescription (including patient-specific requests, such as "preservative-free"), the master formulation record, and any other relevant resources during compounding. Highlight patient-specific requests to draw necessary attention.
- Perform an independent calculation to confirm the prescribed dose and quantity of the active pharmaceutical ingredient (API). If working alone, a drug information centre or a colleague at a different pharmacy can support the double check process.[13]
- Require documentation of an independent double check[7] for each critical verification step in the compounding process.[12]
    - Calculations, if required[12]
    - Identity of each API and excipient before mixing[12]
    - Lot number and expiry date of each API and excipient[12]
    - Weight and/or measurement of each API and excipient[12]
        - The weight can be captured for the final check via video, photograph,[14] or printout from the weigh scale
    - A final check of the finished product has been conducted[12]

Vaccinations

The majority of incidents relating to vaccine administration involved COVID-19 vaccines, despite these vaccines only being available for a short time. COVID-19 vaccines often have storage, preparation, and administration requirements that differ from other vaccinations that pharmacists may be more familiar with, resulting in error. Reported incidents included incorrect dilution and use of an expired product.

> *Incident example: A COVID-19 vaccine was prepared and administered to a patient without the necessary dilution step. The error was recognized soon after when another pharmacist asked if the vaccine had been diluted. The patient, physician, and manufacturer were contacted accordingly.*

Of note, several reports described adverse drug reactions, including one case of anaphylaxis, post-vaccination. Although these are not classified as medication errors, they can serve as an important reminder for pharmacies to be well-prepared to treat such health emergencies.

KEY RECOMMENDATIONS FOR SAFETY:

- Develop a standardized checklist of counselling points to discuss with the patient, both before (e.g., vaccine indication, expected side effects) and after (e.g., monitoring and follow-up) the vaccination.
- Post specific preparation instructions for each vaccine (especially the different COVID-19 vaccines) in the vaccine preparation area.[15]
- Arrange the work environment to facilitate safe vaccine dose preparation and verification (e.g., with minimal distractions, proper lighting, and a clean, uncluttered work area).[15]

Theme 2: Patient Engagement

Patient engagement accounted for approximately 15% of reported harm incidents. Subthemes identified were patient identification and dialogue with patients.

Patient Identification

Patient identification encompassed incidents related to improper procedures for prescription pick-up. Contributing factors included similar patient names and miscommunication between patients and pharmacy staff when confirming identification.

> *Incident example: A patient's compliance pack was delivered to the wrong patient with a similar name. The recipient knew the intended patient and delivered the compliance pack directly. The patient was upset by the breach in privacy caused by the error.*

The "incorrect patient" type of error continues to be frequently reported by community pharmacies in Manitoba[4,16] and is an opportunity to optimize patient care.

KEY RECOMMENDATIONS FOR SAFETY:

- Request a minimum of two patient identifiers at prescription pickup. Preferred identifiers, in addition to the patient's name, include the person's address and date of birth.[5]
- At pickup, open the bag containing the prescriptions to ensure that each prescription label bears the intended patient's name.[5] This is the last opportunity to verify the appropriateness of each medication and confirm patient understanding.

Dialogue with Patients

Errors relating to dialogue between pharmacy staff and patients were often a result of missed patient education or counselling, or a lack of confirmation of patient understanding. Medications being delivered rather than picked up in-person also contributed to the reported incidents, as this limits the opportunity for dialogue with patients.

Some incidents described patients not being aware when a medication should be split for a smaller dose (e.g., half or quarter). Patient dialogue is needed to prevent errors and clarify these situations, which often arise due to drug shortages, complex regimens, or the required dose not being commercially available.

> *Incident example: Since a limited supply of hydrochlorothiazide 12.5 mg tablets was available from the manufacturer, a patient was dispensed 25 mg tablets with label instructions to take ½ tablet daily. The patient took 1 tablet per day and, upon request for an early refill, the error was*

recognized. At the next refill, the patient was verbally reminded of the correct dose and the tablets were cut in half.

Patients and caregivers are an important part of the circle of care and should be included in all discussions and decisions regarding their health.

KEY RECOMMENDATIONS FOR SAFETY:

- Identify and document discussion points (e.g., on the prescription hardcopy) 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.[5]
    - This can include highlighting key information (e.g., half or quarter of a tablet) directly on the vial label or compliance pack label.
- Consider the use of technology to support virtual communication with patients when they are unable to pick up the prescriptions themselves.[5]

Theme 3: Work Environment

Work environment accounted for approximately 22% of all reported incidents. Subthemes identified were external pressure and storage of look-alike medications.

External Pressure

Several incidents occurred when there was a deviation from the standard workflow and functioning of the pharmacy due to external pressures, resulting in error and harm. Complicated regimens, interruptions, and multi-tasking under time pressure, contributed to these incidents.

Incident example: A patient's compliance pack required an immediate replacement within a short period of time. Another patient's compliance pack had been started but could not be completed before the replacement pack was needed, therefore both compliance packs (and their associated medication stock bottles) were open on the same workspace. While filling the replacement pack, phone calls interrupted the process, and an incorrect medication (from the other patient's compliance pack) was included. The patient took a few doses of the incorrect medication, experienced side effects, and required assessment at the hospital.

Staffing concerns permeate many health care settings and have only become more difficult during the pandemic. Community pharmacies are an essential service that continued to provide care to their patients during this challenging time.

KEY RECOMMENDATIONS FOR SAFETY:

- Enhance the use of technology (e.g., a medication synchronization program to align refill dates for a patient's medications) to improve workflow and reduce interruptions.[17]
- Restart the task following an interruption to facilitate a clear, continuous thought process.
- Schedule staff with an appropriate shift overlap during the busiest time(s) of the day and week. When this is not feasible, communicate potential delays to staff and patients to set reasonable expectations.

Storage of Look-Alike Medications

Look-alike medication names, labels, and packages contribute to medication incidents due to confirmation bias – the tendency to "see" information that confirms expectations.[18] If these look-alike medications are stored in close proximity, the likelihood of a selection error increases.

> *Incident example: A patient called the pharmacy to discuss delivered medications. As the patient looked at the tablets and listed the medication names, one was mentioned that did not appear on the patient's profile. The pharmacist then recognized that the wrong tablet had been dispensed into the correctly labelled vial. The two medications were stored side-by-side on the shelf, with similar packaging.*

The Good Label and Package Practices Guides[19,20] help manufacturers create safer product labels, of which pharmacists are key end-users. Despite these Guides, efforts are often needed at the pharmacy level to distinguish look-alike names, labels, and packages, as appropriate.

> **KEY RECOMMENDATIONS FOR SAFETY:**
>
> - Fill one medication (i.e., select the product, count as needed, and label the package) before working on another medication,[4] to minimize the risk of mix-ups.
> - Develop a process to identify and communicate the potential for errors when new drug products with look-alike names, labels, or packages are added to stock.[17]
> - Consider separate storage and auxiliary labels to distinguish look-alike products.
> - Consider incorporating TALLman lettering in the dispensing software as a differentiation strategy for look-alike medication names.[21] The TALLman lettering will then appear onscreen and on printed labels.

Theme 4: Prescriber Communication

Errors involving prescriber communication accounted for approximately 8% of reported incidents. Communication between the pharmacy team and prescriber was either inadequate or absent in these incidents. Subthemes identified areas of focus, which were prescription clarity and coordination between health care providers.

Prescription Clarity

Reported incidents included prescriptions that were ambiguous, contained conflicting information, or contained information in different sections or pages. Verbal or handwritten prescriptions were also included in this subtheme where there may have been an element of needed clarity.

> *Incident example: A pharmacy received a fax with diazepam 5 mg daily for 1 week, and diazepam 2 x 2 mg daily for 1 week – with a note at the bottom of the page that said, "BENZO taper". The pharmacist interpreted this to be 1 week of 5 mg daily and then 1 week of 4 mg daily. The prescriber intended this to be 9 mg daily (as a taper from the patient's usual 10 mg daily). The patient took 2 x 5 mg daily to make up the dose, after which the error was discovered.*

A lack of prescription clarity can lead to misinterpretation of key medication information, and ultimately, patient harm. One incident described a patient's death due to a potentially unclear prescription.

Incident example: A physician contacted the pharmacy to request prescription records for a patient who had passed away. The death investigation suggested that benzodiazepines contributed to the patient's death; the patient's prescription vial label indicated 1 mg twice daily, while the physician intended a dose reduction to 0.5 mg twice daily. The legibility of the dose change on the prescription could not be determined due to damaged pharmacy records.

KEY RECOMMENDATIONS FOR SAFETY:

- Develop a template for communication with the prescriber regarding dose clarifications. Clearly document how the prescription has been interpreted to facilitate necessary corrections.

Coordination Between Health Care Providers

Incidents within the subtheme of coordination between health care providers often described poor communication within the circle of care when there was a change in the patient's medication, dose, or regimen.

Incident example: A patient's INR was 3.6 on a daily dose of warfarin 2 mg. The prescriber indicated on the electronic medical record for home care to decrease warfarin to alternating doses of 2 mg and 1.5 mg daily. The prescriber faxed the pharmacy a prescription for warfarin 1.5 mg daily (and confirmed a reduction from 2 mg daily to 1.5 mg daily); the new dose was sent to the home. The nurse administered the incorrect dose because the note in the medical record did not correlate with the instructions on the pharmacy label.

Seamless and timely transfer of key medication information among multiple health care professionals in different care sectors is needed to prevent medication errors.[22]

KEY RECOMMENDATIONS FOR SAFETY:

- Develop a standardized method of communication between all members of the circle care, and especially during transitions of care.
- Include a copy of the prescriber's order when a new medication or dose is sent to another health care professional (e.g., long-term care nurse, home care nurse).

Theme 5: Staff Training and Education

Staff training and education accounted for approximately 22% of reported incidents. Subthemes identified were areas for improvements – technical and clinical checks, and clinical knowledge.

Technical and Clinical Checks

Reported incidents were often the result of inadequate clinical and/or technical checks. The technical checks were particularly concerning for products with the same medicinal ingredient. These errors led to the patient receiving the incorrect medication, dose, or formulation, with the potential for harm.

Incident example: A patient was dispensed trazodone 100 mg instead of the intended trazodone 50 mg. The patient recognized the error and did not take the medication for 1 week until it could be returned to the pharmacy for correction. The patient did not report symptoms.

Clinical verification by the pharmacist can occur at any point in the process, though the ideal time is during order entry, not after dispensing, to avoid reprocessing the prescription if an error is found. Clinical checks are an important opportunity to assess the indication, effectiveness, safety, and convenience of the medication for the patient.

> *Incident example: A prescription for amoxicillin 875 mg/clavulanate 125 mg was filled for a patient with a documented penicillin allergy. The allergy was missed by the pharmacy staff, and the patient experienced a rash. The patient was subsequently hospitalized and received a different antibiotic.*

Technical and clinical checks by pharmacy technicians and pharmacists, respectively, need to be supported systematically throughout the dispensing process.

> **KEY RECOMMENDATIONS FOR SAFETY:**
>
> - Standardize prescription intake using a questionnaire or checklist to identify/confirm relevant clinical information.[17] This should include allergies and weight (especially for pediatric patients).
> - Integrate bar coding technology into the pharmacy to act as an automated independent double check in the dispensing process.[4,7]

Clinical Knowledge

Reported incidents related to clinical knowledge involved unfamiliarity with the medication or an inappropriate clinical decision. These errors included incorrectly assuming product interchangeability. Patients received the incorrect product, incorrect dose, or inappropriate treatment plan, which potentially led to harm.

> *Incident example: A prescription for hydromorphone 6 mg by mouth every 2 hours as needed for pain, was input and filled as the sustained release formulation, Hydromorph Contin® due to its availability in 6 mg tablets. The prescriber intended for the patient to receive immediate-release hydromorphone, reinforced by the frequency of every 2 hours. The patient experienced sedation and brought the medication to the prescriber; the prescriber checked the medication and recognized the error.*

The pharmacist's clinical verification of the prescription relies on knowledge of the medical condition, correct medication and dosing, and appropriate monitoring parameters.

> *Incident example: An infant was prescribed amoxicillin/clavulanate for acute otitis media at a dose that well exceeded the recommended high-dose regimen of 90 mg/kg/day. The pharmacist dispensed the medication without verifying the appropriateness of the dose. The error was recognized by another pharmacist completing the balance of the prescription a couple of days later, but the infant had already experienced severe diarrhea and was taken to the physician.*

All pharmacy staff members, including pharmacy managers, pharmacists and pharmacy technicians use clinical knowledge within their scopes of practice to optimize safe and effective medication use.

KEY RECOMMENDATIONS FOR SAFETY:

- Facilitate electronic access to medication information resources, including Canadian product monographs and relevant practice guidelines, to allow for efficient research.
- Formalize and regularly communicate standard operating procedures (SOPs) for complex processes as a means to clearly articulate expectations and establish accountabilities for pharmacy staff.[17]
- Provide targeted medication safety learning opportunities to staff. Resources are available from provincial/territorial regulatory authorities and patient or medication safety organizations.[17]

Theme 6: Use of Technology

Technology-related errors accounted for approximately 9% of reported incidents. Identified subthemes were technological features such as the copy function, bar code scanning, and patient profile updates. These errors resulted in the incorrect medication or dose being dispensed, and potential patient harm.

Copy Function

The software's ability to copy the details of previous prescription during order entry optimizes efficiency for chronic medications prescribed at consistent doses. Harm incidents involving the copy function (e.g., overdosed or underdosed), however, occurred when an intended dose change was missed.

> *Incident example: A patient's medication dose was increased. When entering the new prescription, the copy function was used to replicate the previous prescription's information. The dose increase was missed at order entry and by the pharmacist during clinical verification.*

Order entry errors represented 2/3 of incidents reported to the NIDR between January and June of 2020,[23] thus there are opportunities for improvement in this process. Several reported errors involved the copy function during order entry.

KEY RECOMMENDATIONS FOR SAFETY:

- 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.[5]
- Review the original prescription during the verification process – whether for new, hold, or refill prescriptions – to help identify incorrect order entries.[23]

Bar Code Scanning

Bar code scanning technology, when used correctly, helps users identify selection errors before the medication reaches the patient. Errors in this process resulted in patients receiving the wrong medication or dose, and potential patient harm.

> *Incident example: A patient called the pharmacy and informed them that the tablets were a different colour. Upon investigation, it was discovered that the correct strength of the medication was scanned, but the incorrect strength was filled and given to the patient.*

Workarounds can bypass the safeguards of bar code scanning, including: the scanning of one bottle multiple times (when multiple bottles are needed); a break in the workflow between product scanning and filling; and manual entry of the intended bar code.

KEY RECOMMENDATIONS FOR SAFETY:

- Proactively identify and prevent known workarounds (e.g., scanning one bottle multiple times); educate staff about the risks of circumventing safeguards. The most effective strategies are forcing functions that make it impossible to perform specific erroneous acts.[17]

Patient Profile

The patient's profile in pharmacy dispensing software provides pharmacy staff with important information, including medication allergies, current medication use (active prescriptions and over-the-counter products), and medication history (discontinued prescriptions and over-the-counter products). A failure to update the patient profile resulted in incorrect dose errors and potential patient harm.

Incident example: A pharmacist was reviewing a patient's profile with the caregiver and realized that an antiplatelet medication continued to be dispensed and taken by the patient, after it was supposed to be discontinued.

Transitions of care between acute, long-term, and home care settings are often dependent on the community pharmacy for medication-related information to facilitate medication reconciliation, therefore an up-to-date profile is necessary to prevent errors.

KEY RECOMMENDATIONS FOR SAFETY:

- Conduct a medication review with patients and/or their caregivers on a regular basis (the frequency of which is dependent on the health status of the patient) to create an up-to-date list of all prescription, non-prescription, and natural health products currently being used.
    - Assess the patient's medications for appropriateness, effectiveness, safety, and convenience. This includes understanding the indication for each medication. Contact the prescriber to clarify any concerns.
    - Provide the patient and/or caregiver with the updated list and encourage them to share it with all health care providers within the circle of care, especially at transitions of care.
    - Reconcile this list with the patient profile in the dispensing software to ensure that active prescriptions reflect current medication use.

Conclusion

The importance of reporting, analysis, and shared learning from medications incidents is evident in this multi-incident analysis of incidents associated with harm reported by community pharmacies in Manitoba. Key opportunities for continuous quality improvement in pharmacy practice were identified in high-risk processes, patient engagement, work environment, prescriber communication, staff education and training, and use of technology.

TABLE 1. SUMMARY OF KEY RECOMMENDATIONS FOR SAFETY

The recommendations for safety described in the analysis report are organized in the table below according to responsibility (pharmacy support staff, pharmacists, and pharmacy management) and steps in prescription processing.

The steps in prescription processing, adapted from *A Guide to Pharmacy Practice in Manitoba*,[24] are:

- Clinical check (assess appropriateness of prescription for the patient)
- Order entry (input prescription information into the pharmacy dispensing software)
- Dispensing (select, prepare, package, and label medication)
- Technical check (confirm accuracy of the order entry and dispensing steps)
- Patient counselling (provide sufficient information to enable safe and effective use)
- Pick-up / delivery (provide medication to patient or agent)

	Pharmacy Support Staff
ORDER ENTRY	Standardize prescription intake using a questionnaire or checklist to identify/confirm relevant clinical information. This should include allergies and weight (especially for pediatric patients).
	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.
	Verify the printed compliance pack label (or medication administration record [MAR]) with the most up-to-date prescription for each medication.
DISPENSING	Ensure easy access to the prescription (including patient-specific requests, such as "preservative-free"), the master formulation record, and any other relevant resources during compounding. Highlight patient-specific requests to draw necessary attention.
	Arrange the work environment to facilitate safe vaccine dose preparation and verification (e.g., with minimal distractions, proper lighting, and a clean, uncluttered work area).
	Fill one medication (i.e., select the product, count as needed, and label the package) before working on another medication, to minimize the risk of mix-ups.
	Restart the task following an interruption to facilitate a clear, continuous thought process.
	Develop a process to identify and communicate the potential for errors when new drug products with look-alike names, labels, or packages are added to stock.
	Consider separate storage and auxiliary labels to distinguish look-alike products.
PICK-UP / DELIVERY	Request a minimum of two patient identifiers at prescription pickup. Preferred identifiers, in addition to the patient's name, include the person's address and date of birth.
	At pickup, open the bag containing the prescriptions to ensure that each prescription label bears the intended patient's name. This is the last opportunity to verify the appropriateness of each medication and confirm patient understanding.
	Include a copy of the prescriber's order when a new medication or dose is sent to another health care professional (e.g., long-term care nurse, home care nurse).

	Pharmacists
CLINICAL CHECK	Develop a template for communication with the prescriber regarding dose changes, including clarification of the previous and current doses.
	Develop a template for communication with the prescriber regarding dose clarifications. Clearly document how the prescription has been interpreted to facilitate necessary corrections.
	Develop a standardized procedure to follow when a medication regimen is adjusted in the middle of the compliance pack cycle. This may include: • Make the change in the compliance pack label as soon as the new prescription is received. Set an alert in the system to remind staff of the change when the compliance pack is refilled. • When possible, repackage the existing compliance pack to reflect the modified regimen. Alternatively, collaborate with the prescriber to determine whether a medication change can be initiated with the next compliance pack to be dispensed. • Clearly communicate the dose change to the patient and caregiver using the repeat-back method. The change can also be highlighted on the compliance pack label to bring attention to it during administration.
	Review the original prescription during the verification process – whether for new, hold, or refill prescriptions – to help identify incorrect order entries.
	Develop a standardized method of communication between all members of the patient's circle of care, and especially during transitions of care.
	Conduct a medication review with patients and/or their caregivers on a regular basis (the frequency of which is dependent on the health status of the patient) to create an up-to-date list of all prescription, non-prescription, and natural health products currently being used. • Assess the patient's medications for appropriateness, effectiveness, safety, and convenience. This includes understanding the indication for each medication. Contact the prescriber to clarify any concerns. • Provide the patient and/or caregiver with the updated list and encourage them to share it with all health care providers within the circle of care, especially at transitions of care. • Reconcile this list with the patient profile in the dispensing software to ensure that active prescriptions reflect current medication use.
TECHNICAL CHECK	Conduct an independent double check of the medications in the compliance pack against the compliance pack label and the medication stock bottles.
	Perform an independent calculation to confirm the prescribed dose and quantity of the active pharmaceutical ingredient (API). If working alone, a drug information centre or a colleague at a different pharmacy can support the double check process.

PATIENT COUNSELLING	Identify and document discussion points (e.g., on the prescription hardcopy) 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. • This can include highlighting key information (e.g., half or quarter of a tablet) directly on the vial label or compliance pack label.
	Develop a standardized checklist of counselling points to discuss with the patient, both before (e.g., vaccine indication, expected side effects) and after (e.g., monitoring and follow-up) the vaccination.
	Using open-ended questions, ask the patient to state the expected medication and dose (e.g., "What is the name of your medication?" "What dose are you on?"). • In the case of opioid agonist therapy, repeat the medication name and dose back to the patient for confirmation before providing the medication and witnessing its ingestion.

	Pharmacy Management
GENERAL	Formalize and regularly communicate standard operating procedures (SOPs) for complex processes as a means to clearly articulate expectations and establish accountabilities for pharmacy staff.
	Provide targeted medication safety learning opportunities to staff. Resources are available from provincial/territorial regulatory authorities and patient or medication safety organizations.
	Schedule staff with an appropriate shift overlap during the busiest time(s) of the day and week. When this is not feasible, communicate potential delays to staff and patients to set reasonable expectations.
ORDER ENTRY	Enhance the use of technology (e.g., a medication synchronization program to align refill dates for a patient's medications) to improve workflow and reduce interruptions.
	Consider incorporating TALLman lettering in the dispensing software as a differentiation strategy for look-alike medication names. The TALLman lettering will then appear onscreen and on printed labels.
	Implement a policy to inactivate discontinued prescriptions on a patient's profile before, or immediately after, entering the new prescription. • In the case of opioid agonist therapy, create a copy of the new prescription for the log of witnessed and take-home doses to allow for review prior to dispensing and/or administration. Start a new log with each new prescription.

DISPENSING	Post specific preparation instructions for each vaccine (especially the different COVID-19 vaccines) in the vaccine preparation area.
	Integrate bar coding technology into the pharmacy to act as an automated independent double check in the dispensing process.
	Proactively identify and prevent known workarounds (e.g., scanning one bottle multiple times); educate staff about the risks of circumventing safeguards. The most effective strategies are forcing functions that make it impossible to perform specific erroneous acts.
TECHNICAL CHECK	Require documentation of an independent double check for each critical verification step in the compounding process. • Calculations, if required • Identity of each active pharmaceutical ingredient (API) and excipient before mixing • Lot number and expiry date of each API and excipient • Weight and/or measurement of each API and excipient ○ The weight can be captured for the final check via video, photograph, or printout from the weigh scale. • A final check of the finished product has been conducted
PATIENT COUNSELLING	Consider the use of technology to support virtual communication with patients when they are unable to pick up the prescriptions themselves.
	Facilitate electronic access to medication information resources, including Canadian product monographs and relevant practice guidelines, to allow for efficient research.

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