Missed dose medication incidents in the community

By Carolyn Kasprzak, Larry Sheng, Edmond Chiu, Puja Modi, and Certina Ho

A case scenario: Eliquis® (Apixaban; an anticoagulant) prescription was discontinued in January. Bi-annual [prescriptions] printed in December were signed by [the doctor] in February. The bi-annual included an order to continue Eliquis®. Since this medication was recently discontinued [in January], the new order was not entered and was therefore not sent [and included] in the patient's cycle fill.

Missed medication doses can be detrimental to a patient's health, for example, causing relapse of symptom control (e.g. pain) or leading to the development of debilitating withdrawal symptoms for medications such as antidepressants and antipsychotics. Furthermore, missed doses can potentially cause life-threatening harm if a high-alert medication, such as apixaban (an anticoagulant) is involved where the patient may be at risk of developing a stroke due to inadequate anticoagulation therapy. Incidents associated with missed doses often arise from system-based flaws and therefore are preventable when potential pitfalls in the healthcare workflow are identified and mended.

To examine medication incidents that resulted in missed doses, the Institute for Safe Medication Practices Canada (ISMP Canada) analyzed 156 medication incidents voluntarily reported to the Community Pharmacy Incident Reporting (CPhIR) program (https://www.cphir.ca). These incidents were categorized into five main themes and further sub-themes (Table 1).

Table 1.

Summary of Themes & Sub-themes of Missed Dose Medication Incidents

Main Themes:	Sub-themes:
Main Theme 1: Compliance Packaging	I. Over-the-Counter (OTC) Medications II. Medication Samples III.Medication Not in Stock IV. Complex Regimen V. Long Term Care (LTC) Home
Main Theme 2: Medication Regimen Adjustment	I. Over-the-Counter (OTC) Medications II. Medication Samples III.Medication Not in Stock IV. Complex Regimen V. Long Term Care (LTC) Home
Main Theme 3: Transitions of Care	I. Pharmacy (Prescription) Transfer II. Hospital Discharge III.Long Term Care (LTC) Admission or Discharge
Main Theme 4: Technological Complications	I. Systematic/Technological Flaw II. User Error
Main Theme 5: Medication Distribution	I. Pick Up II. Delivery

1. COMPLIANCE PACKAGING

Compliance packaging (also known as multi-medication compliance aids, such as, blister packs, dosettes, and medication packets/rolls) is frequently offered to patients in the community to improve medication adherence. Medication incidents that resulted in missed doses often involved over-the-counter (OTC) medications and medication samples. Incidents also occurred when medications were not available at the time of compliance package preparation at the pharmacy due to drug shortages. It is important for pharmacies to have policies and procedures in place for compliance packaging preparation.

When medication dosing involves complex regimens (e.g. dosing only on certain days of the week or alternating dosages), missed doses may occur in compliance packaging if documentation is inaccurate and if independent double checks are not in place. When possible, prescribers should simplify dosing regimens with consideration of available product formulations. Pharmacy staff should be performing independent double checks, especially when patients have complex dosing regimens.

For ease of administration by the nursing staff, many long-term care (LTC) facilities have their residents' medications prepared as unit-dosed medication packets/rolls by a community pharmacy. Missed dose medication incidents may occur due to miscommunication between LTC and pharmacy staff (e.g. without adequate follow-up or verification on either side). An electronic information system for instant and reliable communication between LTC facilities and pharmacies may help prevent these incidents.

2. MEDICATION REGIMEN ADJUSTMENT

Patients' medication regimens are frequently adjusted to optimize their pharmacotherapy needs based on changing underlying disease states and goals of care. These changes may lead to insufficient doses if there is miscommunication between pharmacy staff and the patient, lack of medication reviews/reconciliation, and environmental distractions. When prescriptions are filled in compliance packaging, pharmacy staff should verify the most up-to-date prescription order and medication regimen changes should be clearly documented.

3. TRANSITIONS OF CARE

Patients often move between different healthcare settings and providers. They may change community pharmacies when relocating to a new geographical region; they may be admitted to the hospital and get discharged with alterations to their medication therapy; and some may be admitted to LTC facilities, etc. Unfortunately, during these transitions of care, patients are more vulnerable to medication discrepancies and incidents due to multiple factors, for example, inadequate handover between healthcare providers, and a lack of communication between healthcare providers and patients.

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Carolyn Kasprzak is a Clinical Pharmacist at Runnymede Healthcare Centre and a Consultant Pharmacist at the Institute for Safe Medication Practices Canada (ISMP Canada); Larry Sheng is a PharmD Student at the School of Pharmacy, University of Waterloo; Edmond Chiu is a Medication Safety Analyst at ISMP Canada; Puja Modi completed a PharmD rotation at the Leslie Dan Faculty of Pharmacy, University of Toronto, and ISMP Canada in 2017; and Certina Ho is a Project Lead at ISMP Canada.

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Upon discharge, medication reconciliation and patient education are crucial steps to ensure that medication changes after hospital admissions/discharge were followed up. Hospital helplines for patients and other primary healthcare providers would ameliorate bi-directional communication post patient discharge. When patients are transferring in and out of LTC facilities, there should be a standardized process to communicate admissions and discharges among different healthcare settings and providers. Essentially, communication is key to medication safety.

4. TECHNOLOGICAL COMPLICATIONS

While health information technology, such as pharmacy software and electronic medical records, greatly improves efficiency, if there is a glitch in the software or when practitioners incorrectly use the technology, missed dose medication incidents may occur. Health information software developers should actively collaborate with their end-users (i.e. front-line healthcare practitioners) and consider human factors engineering principles when improving the UX (user experience) and UI (user interface) of the software. Adequate staff training of the software and technology is also fundamental.

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5. MEDICATION DISTRIBUTION

The final step of dispensing medication to patients at a community pharmacy is medication pick-up or delivery. Independent double checks should be performed at medication pick-up to verify, for instance, the number of prescriptions being picked up, and for which medications, etc. Multiple medications filled for the same patient should be placed together with system-based reminders for pharmacy staff. If prescription delivery is arranged, patients should always check the contents of the prescription bag before taking any medications and to call the pharmacy if they have any questions regarding their medications.

Despite healthcare professionals' best efforts to constantly strive for safe medication use, incidents may still occur. Regardless of the practice settings, reporting medication incidents is highly encouraged, as it allows analysis to identify potential contributing factors, and consequently help resolve system-based flaws to prevent similar incidents from occurring in the future. H