

ISMP Canada Safety Bulletin

Volume 15 • Issue 12 • December 30, 2015

Medication Incidents that Increase the Risk of Falls: A Multi-Incident Analysis

An aggregate analysis of medication incidents showed the following key themes associated with falls and risky fall-related situations:

- Failure to anticipate the inherent risks of medications
- Inadequate proactive clinical assessment
- Communication gaps
- Failure of medication-use processes

Falls remain the leading cause of injury-related hospital admissions among Canadian seniors, with 20% to 30% of this age group (age 65 years and older) falling each year.¹ Psychotropic medications and polypharmacy are widely recognized as factors contributing to an increased risk of falls, because of the inherent clinical effects of the medications, their adverse effects, additive toxic effects, and drug interactions.^{1,2} Lack of adherence with medication therapy and less-than-optimal treatment of the underlying disease state may also trigger falls. ISMP Canada has received reports of medication-related falls from various sectors of healthcare, including hospitals, long-term care, and the home environment.

A multi-incident analysis of reported incidents was conducted to identify system processes that had clearly resulted in a fall or that could increase the risk of falls (i.e., by causing a symptom that could contribute to a fall).

Methodology and Quantitative Findings

Reports of medication incidents were extracted from voluntary reports submitted to ISMP Canada's medication incident reporting databases from August 1, 2000, to December 31, 2014.* Key words such as "fall", "fell", "stumbled", and "tripped", as well as terms relating to symptoms that increase the risk of falls (e.g., "drowsiness", "dizziness", "blurred vision", "balance", and "muscle weakness") were used for searching. From this database search, reports of 938 medication incidents were identified and reviewed. Those with descriptive text identifying the occurrence of a fall or the presence of a symptom that was likely to lead to a fall were retained. A total of 243 incidents were included in the final analysis, which was conducted according to the methodology outlined in the Canadian Incident Analysis Framework.³ Patient harm was reported to have occurred in 133 (54.7%) of these incidents. Table 1 outlines the most common classes of medications associated with falls or an increased risk of falls.

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

Table 1. Top Medication Classes/Groups Associated with Falls or Increased Risk of Falls

Medication Class	Number of Reports (n=243)
Opioids	61 (25.1%)
Psychotropics (including antipsychotics, sedative hypnotics, antidepressants)	52 (21.4%)
Cardiac medications (including diuretics)	42 (17.3%)
Hypoglycemic agents (including insulin)	33 (13.6%)

Findings of the Qualitative Analysis

Analysis of the incidents revealed 4 main themes, each with one or more associated subthemes (see Figure 1). This bulletin describes each of the main themes, along with illustrative examples.

Theme: Failure to Anticipate Inherent Risks of Medications

Some medications have well-known adverse effects, unrelated to dose, that can increase the risk of falls.

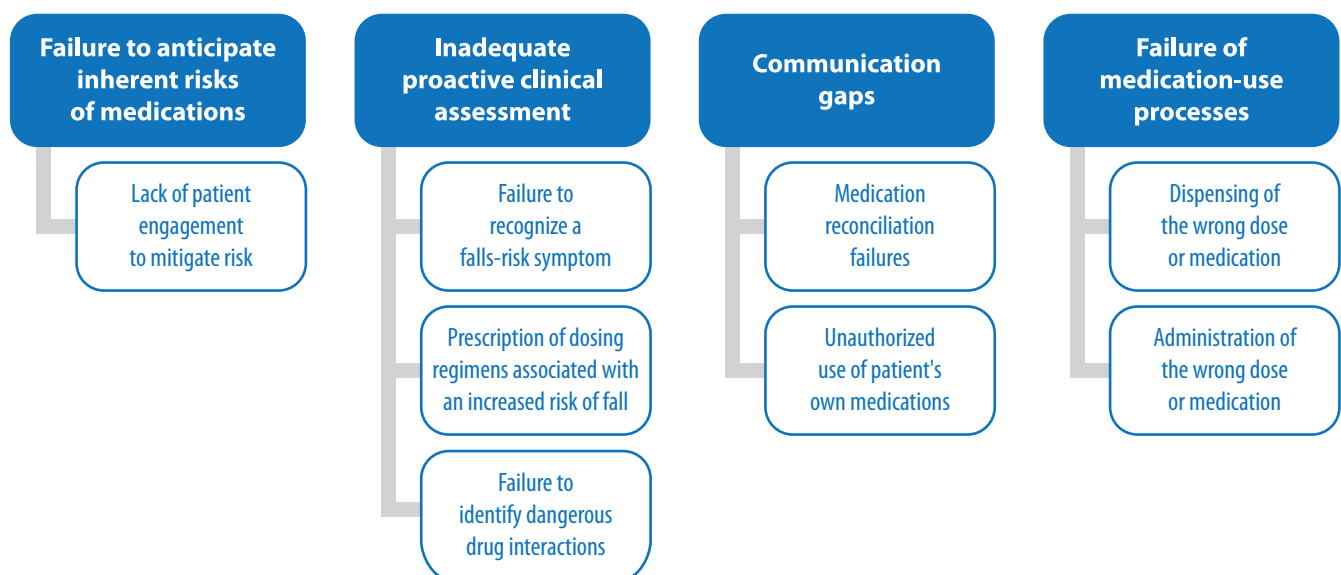
These adverse effects include dizziness, drowsiness, syncope, bradycardia, muscle weakness, and Parkinson-like symptoms.¹ In 19 (7.8%) of the reported incidents in this analysis, the medication carried an inherent risk related to the potential for falls.

Incident Example

A patient was given codeine 30 mg and dimenhydrinate 50 mg in the evening. The next morning, the patient reported that she had fallen in the night and had returned to bed herself. There was no apparent injury, but the onset of slurred speech prompted computed tomography scanning of her head.

Patient and caregiver education and engagement are critical to preventing harm from known clinical and adverse effects of medications. Patients should be advised to be alert to the occurrence of these effects and to inform caregivers and the healthcare team if they occur. Patients should also be given strategies to reduce the risk and action plans for what to do if adverse effects do occur. The patient’s voice was evident in many of the reported incidents: they reported their concerns to the healthcare team, which often allowed an intervention to be undertaken to avert harm.

Figure 1. Main themes from the qualitative analysis



Theme: Inadequate Proactive Clinical Assessment

Clinical assessment is an essential skill in prescribing, dispensing, and administering a medication safely and effectively. Integrating patient-specific factors (e.g., renal function, weight, cognition), medical status, physical limitations, and preferences into the clinical assessment can allow interventions to be initiated to lower the risk of falls. The current analysis identified several incidents that demonstrated the value of proactive clinical assessment. The analysis also identified 25 (10.3%) medication incidents in which clinical assessment appeared to be absent or overlooked, including cases in which an inappropriate medication was prescribed, a symptom that could predispose the patient to falls went unrecognized, or opportunities to identify a dangerous drug–drug interaction were missed.

Incident Example

A patient taking warfarin, verapamil, rosuvastatin, and citalopram was started on clarithromycin. After starting the new medication, the patient experienced severe bradycardia and was admitted to hospital. It was determined that a known drug interaction between clarithromycin and verapamil had caused her bradycardia, which could have led to a fall.

Contributing factors that may have led to the absence of clinical assessment and resultant interventions included knowledge deficits, drug interaction warning fatigue, neglect of voiced patient concerns, and lack of consideration of patient-specific factors. Conversely, in descriptions of cases in which potential adverse drug events (and, by extension, potential falls) were averted, the involvement of a pharmacist or a nurse was typically noted.

Theme: Communication Gaps

Medication reconciliation is a vital process at points of transition in the healthcare system. Cases were identified in which deficits in communicating necessary information during hospital medication reconciliation processes (at admission or discharge) led to incorrect orders on admission or conflicting or absent information at discharge. Communication gaps

were also evident in cases of patients self-administering their own medications during the hospital stay without notifying staff and cases in which healthcare professionals failed to engage patients in dialogue about their medications.

Incident Example

A pharmacist saw a patient at home 5 days after discharge from hospital. During the visit, it was discovered that the dosage information about gliclazide (an oral hypoglycemic) provided to the patient on the hospital’s medication discharge plan (40 mg twice daily) conflicted with the prescription instructions received at discharge (gliclazide MR 30 mg each morning). As a result, the patient was taking gliclazide MR 30 mg twice daily and was experiencing symptoms of hypoglycemia. Although the patient did not fall, the medication error created a risky condition that could have resulted in a fall. Fortunately, the error was identified and corrected before harm occurred.

Failure to engage patients in dialogue when completing admission or discharge medication reconciliation in acute care facilities was identified as a factor contributing to fall incidents.

Theme: Failure of Medication-Use Processes

Three-quarters of the medication incidents (n=183) were determined to have resulted from poor execution of dispensing and administration processes. The majority of these incidents involved dispensing or administration of incorrect medications or dosages, which resulted in the appearance of a symptom that either caused or was likely to cause a fall.

Incident Example

Following surgery, a patient inadvertently received double his methadone dose on 2 consecutive days. After receiving one of these double doses, the patient became quite drowsy and fell while trying to get into bed. Fortunately, no injuries resulted from the fall.

In the hospital setting, factors contributing to administration errors that may have been associated with falls or increased risk of falls included missing documentation for medications administered, lack of

documentation processes to indicate removal of a patch before application of a new patch, illegibility of orders, use of dangerous abbreviations, lack of an independent double check for high-alert medications, and use of preprinted order sets not tailored to a patient's specific needs.

In the community pharmacy setting, factors contributing to dispensing errors included look-alike products or packaging, errors in transcription from the prescription to the computer system, simultaneous processing of multiple patients' prescriptions, and issues related to accepting verbal orders. Notably, patients and caregivers identified many of the incidents themselves and contacted the pharmacy directly for resolution.

Discussion

Research has led to the creation of a list of “fall risk-increasing drugs”⁴ and several risk assessment tools are readily available for assessing the risk of falls.⁵⁻⁷ Hospitals and long-term care facilities are encouraged to have a regular medication review process in place for patients who have been identified as being at risk of falling. All healthcare providers, patients, and caregivers should be part of the assessment and intervention process, with the goal of reducing the overall number of medications and evaluating each medication's potential for contributing to falls.¹ In addition, safeguards to reduce the likelihood of medication administration errors should be considered.

The Public Health Agency of Canada recently reported that 50% of fall-related hospital admissions in Canada originated from a fall at home.¹ Many health care regions have implemented screening and falls-prevention programs for patients who are receiving home care; however, many of these programs do not include a comprehensive medication review. In addition, for many patients living independently in the community, there has been no formal consideration of fall risk. Home care providers and community-based pharmacists can support and assist other primary and community healthcare providers in utilizing structured assessments to reduce medication-related falls.

Conclusion

Reducing the occurrence and risk of falls requires commitment, effective teamwork and excellent communication from the entire spectrum of the healthcare system, including patients and their caregivers, community and home care providers, and all care facilities. Organizations can create protocols and establish processes for structured assessment of known risk situations. Such protocols and processes can also be used to engage patients in their own care and to empower care teams to intervene in situations that require clinical judgement.

Acknowledgements

ISMP Canada greatly appreciates support for this analysis from the *Canadian Society of Hospital Pharmacists - Ontario Branch* through the Scott Walker Research Grant.

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



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