November 2016 ■ Volume 4 Issue 11

ISMP

Long-Term Care Advise ERR™

Educating the Healthcare Community About Safe Medication Practices

Medication incidents that increase the risk of falls

Resident falls happen frequently in long-term care facilities (LTC). According to a falls management program for nursing facilities offered by the Agency for Healthcare Research and Quality (AHRQ), approximately half of the 1.6 million residents in US LTC facilities fall annually.[1] Of those, 1 in 3 will fall two or more times each year. AHRQ reports that serious injuries occur in 1 out of every 10 residents who fall, and about 65,000 LTC patients suffer a hip fracture every year.[1] Even if residents who fall do not suffer injuries, they often develop a fear of falling that results in self-imposed limitations on mobility and activities contributing to a reduced quality of life.

While the effects of aging, medical conditions, behavioral traits, and environmental hazards can lead to falls, psychotropic medications and polypharmacy are also widely recognized as key factors contributing to an increased risk of falls. This is due to the inherent clinical effects of medications and their adverse effects, additive toxic effects, and interactions with other drugs.[1-3] Lack of adherence with medication therapy and less-than-optimal treatment of the underlying disease state may also trigger falls.

ISMP's sister organization, ISMP Canada, recently conducted a multi-incident analysis of error reports it received of medication-related falls from various healthcare settings, including hospitals, LTC facilities, and the home environment.[4] The analysis was conducted to identify systems and processes that had clearly resulted in a fall or that could increase the risk of falls. Because the incidence and causes of falls in both Canadian and US seniors are similar, we are sharing the findings of this analysis with US LTC facilities. While most LTC facilities already have fall prevention programs in place,[1] the results of this analysis may help facilities improve the systematic processes they have in place for assessment of the impact of medications on falls, interventions to reduce fall risk, and long-term monitoring of medication-related fall risks.

Methodology and Quantitative Findings

Reports of medication errors related to falls were extracted from voluntary reports submitted to ISMP Canada's medication error 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," "muscle weakness") were used to conduct the search. A total of 938 medication errors were identified and reviewed. From these, 243 errors with descriptive text identifying the occurrence of a fall or the presence of a symptom that was likely to lead to a fall were included in the final analysis. Patient harm was reported to have occurred in 133 (54.7%) of these errors. **Table 1** outlines

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%)

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Pneumococcal vaccine guidelines not followed in LTC facilities. The Advisory Committee on Immunization Practices (ACIP) of the Centers for Disease Control and Prevention (CDC) issued new recommendations for pneumococcal vaccination in September 2014, with updated recommendations related to intervals in September 2015. Specifically, the ACIP recommends that immunocompetent adults age 65 years and older who have not previously received pneumococcal vaccine receive the pneumococcal conjugate vaccine (PVC13, **PREVNAR13**) followed by the pneumococcal polysaccharide vaccine (PPSV23, **PNEUMOVAX 23**) 1 year or more following the Prevnar13 dose. The full ACIP recommendations are available at: www.ismp.org/sc?id=2796, and a simple chart of the new guidelines can be found at: www.ismp.org/sc?id=2797.

The two vaccine approach replaces the use of one pneumococcal vaccine only, which was previously recommended before 2014. The new recommendations also change the interval between the two vaccines to 1 year or more. Many long-term care (LTC) facilities are unaware of the new requirements and are using old guidelines. However, the Centers for Medicare & Medicaid Services (CMS) has asked states to enforce the recommendation as a requirement for nursing facilities.

In Wisconsin, it was reported that 4 skilled nursing facilities in 2016 have received or are facing Immediate Jeopardy Level Deficiencies for noncompliance in their vaccination programs (www.ismp.org/sc?id=2795). Therefore, facilities, in concert with their medical directors, are encouraged to review their immunization program, in particular the pneumonia vaccination policy, to assure that it is reflective

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Supported by educational grants from Baxter, Novartis, and Fresenius Kabi

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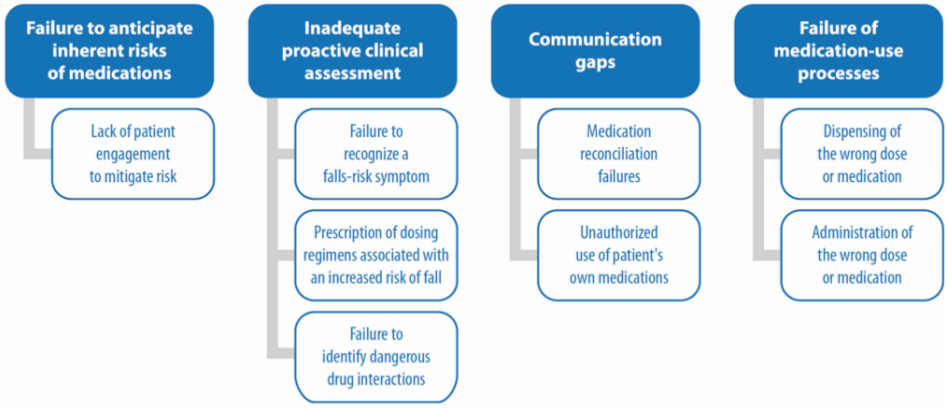
the most common classes of medications associated with falls or an increased risk of falls.

Findings of the Qualitative Analysis

Analysis of the errors revealed 4 main themes, each with one or more associated subthemes (**Figure 1**). Each of the main themes is described below, along with illustrative examples.

Figure 1. Main themes from the qualitative analysis.



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. In 19 (7.8%) of the reported errors in this analysis, the medication carried an inherent risk related to the potential for falls.

In one case, a patient was given codeine 30 mg and diphenhydr**AMINE** 50 mg in the evening. The next morning, the patient reported to her nurse that she had fallen during the night and had returned to bed herself. There was no apparent injury, but the onset of slurred speech prompted ordering a computed tomography (CT) scan of her head.

Patient, resident, and caregiver education and engagement are critical to preventing harm from known clinical and adverse effects of medications. Residents should be advised to be alert to the occurrence of these effects and to inform caregivers if they occur. Residents should also be given strategies to reduce the risk of adverse effects and action plans for what to do if adverse effects occur. In many of the reported events, the patient or resident reported their concerns to a healthcare professional, which often led to an intervention to help avert the risk of a fall.

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 errors that demonstrated the value of a proactive clinical assessment. The analysis also identified 25 (10.3%) medication errors 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.

For example, a patient taking verapamil (**CALAN**) was started on clarithromycin (**BIAXIN**). After starting the new medication, the patient experienced severe brady-

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of the new guidelines. Facilities can also ask their consultant pharmacists to help educate staff about the new guidelines.

CMS issues new requirements. In October, the Centers for Medicare & Medicaid Services (CMS) issued a new set of requirements for long-term care facilities (www.ismp.org/sc?id=2818). The new regulations cover a wide range of areas, including:

- A new requirement for pharmacist review of the resident's medical chart during monthly drug regimen review
- A new definition of psychotropic medications
- A requirement for an antimicrobial stewardship program
- New requirements for a Quality Assurance and Performance Improvement (QAPI) program

Users of prefilled influenza vaccines, take notice. With the Sanofi prefilled syringes of **FLUZONE QUADRIVALENT** (influenza vaccine) and **FLUZONE HIGH-DOSE** (influenza vaccine for patients 65 years and older), the plunger stopper interferes with the ability to read the label text (**Figure 1**). In particular, the words "High-Dose" are difficult to read on the product intended for older patients. We recently asked Sanofi to look into this situation and to improve label visibility. Perhaps a white background could be placed on the syringe upon which the text could

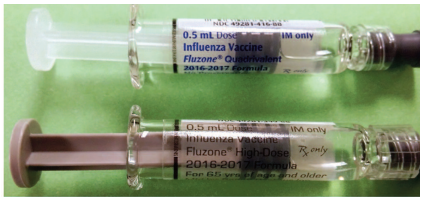

Figure 1. These influenza vaccine syringes look similar but one (bottom syringe) is "High-Dose" and only for patients 65 years and older.

be printed, or a different color stopper could be used to provide contrast for the text. In the meantime, please make your staff aware of this potential problem. Also, it is recommended to segregate the storage of high-dose and regular influenza vaccines in the facility (e.g., in different bins).

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cardia which required admission to the hospital. It was determined that a known drug interaction between clarithromycin and verapamil had caused the 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 deficit of the healthcare professional, drug interaction alert fatigue, neglect of voiced patient/resident concerns, and lack of consideration of patient/resident-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 the 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 where healthcare professionals failed to engage patients or residents and their family in dialogue about their medications.

In one case, a pharmacist who visited a patient 5 days after discharge from a hospital noticed that the medication documented on the discharge plan for gliclazide 40 mg twice daily (an antidiabetic drug not available in the US but similar to glipi**ZIDE** [**GLUCOTROL**]) conflicted with the instructions received at discharge to take 30 mg each morning. As a result, the patient took 40 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.

Also, LTC staff need to be aware of potential inaccuracies in hospital discharge medication lists and thus confirm any discrepancies between the medication list and the admission orders with the prescriber and resident/family. In addition, medication lists sent to hospitals from LTC facilities when a resident is hospitalized should be confirmed for accuracy. Keeping accurate medication lists is important in LTC facilities, as a resident's need for hospitalization could occur suddenly, and time to update the list afterwards may not be possible. (For more information on this topic see the July 2013 issue of *Long-Term Care AdviseERR*.)

Theme: Failure of medication-use processes

Three-quarters of the medication errors (n=183) were determined to have resulted from poor execution of dispensing and administration processes. The majority of these errors 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.

To cite an example, a patient inadvertently received twice the amount of prescribed pain medication on 2 consecutive days. After receiving the first double dose, the patient became drowsy and fell while trying to get into bed. Fortunately, no injuries resulted from the fall.

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 (e.g., fenta**NYL** 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. Factors contributing to dispensing errors included look-alike products or packaging, errors in transcription from the order to the computer system, simultaneous processing of multiple patients' orders (including orders for multiple patients sent on the same

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T for two (or maybe 5). In the past few years, the US Food and Drug Administration (FDA) has approved many new products for use with diet and exercise to improve blood sugar control in adults with diabetes. Four of these products are long-acting medications available in injectable pens, two are indicated for both type 1 and type 2 diabetes, and three for just type 2 diabetes. Unfortunately, all five of these new products begin with the letter T.

- **TRADJENTA** (linagliptin), a dipeptidyl peptidase-4 (DPP-4) inhibitor, is an oral tablet indicated as an adjunct to diet and exercise to improve glycemic control in adults with type 2 diabetes mellitus.
- **TRULICITY** (dulaglutide) injection, a glucagon-like peptide-1 (GLP-1) receptor agonist is a once-weekly injectable prescription medication to improve blood sugar in adults with type 2 diabetes mellitus.
- **TANZEUM** (albiglutide) for injection, also a once weekly GLP-1 receptor agonist, is indicated as an adjunct to diet and exercise to improve glycemic control in adults with type 2 diabetes mellitus.
- **TOUJEO SOLOSTAR** (insulin glargine injection) pen, a long-acting insulin, is available as 300 units/mL for adults with type 1 and type 2 diabetes, regardless of whether they have previously taken insulin. Its release is gradual to provide stable insulin levels over at least 24 hours.
- **TRESIBA FLEXTOUCH** (insulin degludec injection) pen is a long-acting insulin for adults with type 1 and type 2 diabetes and is available in 2 concentrations: 200 units/mL and 100 units/mL.

Although we have not received any error reports detailing mix-ups among these products, there are concerns about the risk of name and strength confusion when prescribing and using these products. Be proactive and take steps to differentiate the names and concentrations on computer screens, medication administration records, and any order sets your facility may have. Make sure that the 'read back' method is used for any telephone orders

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fax page), and issues related to verbal orders.

Discussion

LTC facilities are encouraged to have regular medication review processes in place for residents who have been identified as being at risk of falling. All healthcare providers (physicians, pharmacists, and nurses), residents, and their family 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. Staff should not assume this is the sole responsibility of the consultant pharmacist. In addition, safeguards to reduce the likelihood of medication administration errors should be considered.

Conclusion

Research has led to the creation of a list of "fall risk-increasing drugs,"[6] and numerous risk assessment tools and long-term fall management programs are readily available for reference,[7-9] including the AHRQ Falls Management Program: A Quality Improvement Initiative for Nursing Facilities.[1] The AHRQ program directs both the immediate response to a fall along with long-term fall management, with a focus on periodic screening assessments (including when new medications are prescribed), and the development of individualized interventions for patients at risk of falling. Such interventions can also be used to engage residents in their own care and to empower care teams to intervene in situations that require clinical judgement. The Centers for Disease Control and Prevention (CDC) also has fall prevention-related tools available on its website,[10] as does the Society of Post-Acute and Long-Term Care Medicine (AMDA) at www.ismp.org/sc?id=2827.

ISMP gratefully acknowledges ISMP Canada for this article, which was adapted from the December 30, 2015, article in the ISMP Canada Safety Bulletin.[4]

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that are received. Also evaluate where and how these products can be safely stored.

U-500 insulin syringe available. The new U-500 syringe from BD, previously mentioned in the August 2016 newsletter, are now available for purchase. Before the new syringe, doses of U-500 insulin had to be drawn from a vial using either a U-100 syringe or tuberculin syringe, increasing the risk of dosing errors. Unfortunately, the new U-500 syringe does not have a safety needle to help protect against needlestick injuries. This may rule out use of U-500 syringes in some facilities, although the package insert for **HUMULIN R U-500** insulin notes that patients using the vials must be prescribed U-500 syringes. The U- 500 insulin KwikPen is available as an alternative.

Worth reading...

Unintentional Administration of Insulin Instead of Influenza Vaccine: A Case Study and Review of US Reports

Citation: Clogston J, Hudanick L, Suragh TA, et al. Unintentional administration of insulin instead of influenza vaccine: a case study and review of reports to US vaccine and drug safety monitoring systems. *J Drugs Ther Perspect.* 2016;32(10):439-46. http://link.springer.com/article/10.1007%2Fs40267-016-0333-2

Summary: This case study is hot on the heels of last month's discussion in *Long-Term Care AdviseERR* of 50 cases of accidental mix-ups between influenza vaccine and insulin in Brazil. The study looks at 22 cases of insulin and influenza vaccine mix-ups in the last 10 years known to the Centers for Disease Control and Prevention (CDC) and the US Food and Drug Administration (FDA), including one death.

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