Medication Assessment: One Determinant of Falls Risk

ABSTRACT

Medication assessment is often absent from falls assessment and reassessment. As a result, patients who are at risk for falls may receive medications that increase falls risk. In 2006, more than 4,000 of the total 33,882 falls reported to PA-PSRS were associated with concomitant use of two or more medications. Seventy percent (23,806) of the falls did not result in any patient harm, and less than 1% (17) indicated deaths associated with falls. Medication classes contributing to fall risk that were most frequently reported to PA-PSRS include anxiolytics/hypnotics, antidepressants, neuroleptics, opioid analgesics/antagonists, and insulin/oral hypoglycemics. Risk reduction strategies include recognizing the problem and involving pharmacy staff in developing medication assessment and reassessment strategies for patients at risk for falls. (Pa Patient Saf Advis 2008 Mar;5[1]:16-8.)

> [An elderly] *patient had been assessed at 7 a.m.*; [the patient was] *in bed*, [there were] *no unusual findings, and four side rails were up as per order. At approximately 7:30 a.m., a nurses aide went into the room and found the patient on floor, unresponsive. No carotid pulse was noted. Resuscitation was initiated, but unsuccessful. . . . The patient had been prescribed benzodiazepines, anticoagulants, laxatives, diuretics, and antipsychotic medications.*

Medications may have compounding effects that increase the potential for falls or the potential for harm from falls. Although most healthcare professionals consider patients' falls risk, medications may be prescribed and dispensed without proper consideration of patient selection, contraindications, or drug-drug interactions for patients who are at high risk for falls. Some PA-PSRS reports, such as the one above, discuss patients who were taking medications that could have factored into the falls or the falls outcomes. Other reports did not indicate initial medication high-risk falls assessments, or made it clear that patients were not subject to medication re-evaluations after falling.

Over the course of one year (2006), a total of 33,882 falls events were reported to PA-PSRS. Of these, the severity of effect was reported as no injury in 70% of falls (23,806). (See Table 1.) The most common injury as a result of falls required the application of ice, dressings, and limb elevation. There were, however, reports of severe injuries that required sutures, splints, fractures, and surgery. Less than 1% (17 reports) indicated death as the result of falls.

The Joint Commission requires organizations to implement and evaluate the effectiveness of a falls reduction program.[1] The falls reduction program should include an evaluation of falls history and medication review. A literature review revealed that many healthcare facilities include pharmacy review of medications *only* after a patient falls or is identified as at high risk for falling.[2] A review of the 2006 PA-PSRS reports of falls associated with medications indicated that there was a concomitant use of two or more medications in more than 4,000 instances. This concomitant use may have contributed to patients' falls risk (see Table 2), although most of these reports indicated that the medications prescribed for the patients did not or were not known to contribute to the patient falls. A medication review by pharmacists can assist to identify and notify prescribers of medications that require adjustment. If possible, this review is conducted during the initial falls assessment, but there should also be a stopgap measure during prescription order fulfillment in which newly ordered medications are reviewed to determine if there will

Table 1. Severity of Effects Associated with 2006 PA-PSRS Reported Falls

SEVERITY OF EFFECTS	NUMBER OF FALLS	PERCENTAGE (%)
No injury	23,806	70%
Required dressing, ice, cleaning, limb elevation, or topical medication	6,349	19%
Resulted in suturing, steri-strips, fracture or splinting	923	3%
Resulted in surgery, casting, or traction	349	1%
Patient died as a result of fall	17	<1%
Not specified	2,438	7%
Total	33,882	100%

Table 2. Concomitant Use of Two or More Medications Associated with Patient Falls

NUMBER OF MEDICATIONS LISTED	2006 PA-PSRS FALLS REPORTS	
2	2,173	(54%)
3	1,135	(28%)
4	492	(12%)
5	158	(4%)
6	41	(1%)
7	7	(<1%)
8	2	(<1%)
9	1	(<1%)
Total	4,009	(100%)

be an increase in falls risk. Including a pharmacist is important because many falls are the result of dosage issues, drug-drug interactions, or other problems related to medications. Further, the pharmacist is an integral part of the healthcare team for patient safety. Certain drugs may have exacerbating effects that contribute to patient falls. The dosage adjustment and discontinuation of these medications can lower the potential for a patient fall.[3]

Medications Contributing to Falls Risk

Commonly prescribed medications, including antidepressants, anxiolytics/hypnotics, and insulin and oral hypoglycemics, increase the risk of falling by causing changes in cognitive and physical function, dizziness or lightheadedness, balance difficulties, confusion, and sedation.[2] Ongoing pharmacy review of patients' medications can identify potential interactions and side effects that may increase falls risk, and when possible, identify opportunities to reduce the dose of medications, discontinue medications, or select alternatives. Reducing the number and types of medications, particularly antidepressants and anxiolytics/hypnotics, can be an effective falls prevention strategy when used alone or as part of a multicomponent intervention.[2] In 2006, the medication classes associated with falls that were most frequently reported to PA-PSRS included anxiolytics/hypnotics, antidepressants, neuroleptics, opioid analgesics/antagonists, and insulin/oral hypoglycemics (see "Medication Classes Most Commonly Reported with Falls in PA-PSRS").

Routine medication assessment and reassessment as part of identifying a patient's falls risk is important when interventions are implemented to prevent patient falls, yet according to Perell et al., not all available falls assessment tools consider these measures necessary to evaluate fall risk.[4]

Of the 33,882 falls reports submitted to PA-PSRS in 2006, falls assessments identified 55% of the patients at high risk for falls, while 22% of the patients who fell had not received falls risk assessments at all. (See Table 3.)

PA-PSRS Example

The following PA-PSRS report outlines the need for routine medication assessment and reassessment in falls prevention.

> *A 66-year-old patient was found on the bathroom floor. He sustained a subdural hematoma that required surgical intervention. He had been prescribed cardiac/antihypertensive medication prior to the fall but had not been considered high risk for falls.*

Medications may be prescribed, dispensed, and administered without proper consideration of patient selection criteria, contraindications, and drug-drug interactions for patients who are identified at high risk for falls. The inclusion of pharmacy staff can provide ongoing medication assessment and reassessment

Medication Classes Most Commonly Reported with Falls in PA-PSRS

The following medication classes associated with falls were most frequently reported to PA-PSRS in 2006.

Anxiolytics/hypnotics. Benzodiazepines are the most commonly reported anxiolytic drugs. Common side effects include orthostatic hypotension, vertigo, and lethargy. Due to the onset of action of these drugs (within 30 minutes to 1 hour, with a peak action of 1 to 2 hours), unsteady gait is a significant concern, particularly with concomitant use of other medications and other disease processes.[1]

Antidepressants. While these medications elevate mood and improve mental alertness, one significant adverse effect is orthostatic hypotension, which increases the risk for falls and is a potentially serious problem, particularly in the elderly.[1]

Neuroleptics. These medications work to block dopamine and serotonin receptors and many of the newer agents are also adrenergic, cholinergic, and histamine receptor blockers. The actions of these medications cause side effects that include orthostatic hypotension, vertigo, confusion, and extrapyramidal effects.[1]

Opioid analgesics/antagonists. Adverse effects include respiratory depression and sedation. These effects, combined with population-specific conditions, difficulty with ambulation, and concomitant use of other medication, may increase the risk for falls.[1]

Insulin/oral hypoglycemics. Due to the various types of exogenous insulin and oral hypoglycemic agents, the duration of action varies from patient to patient. For exogenous insulin, the injection site and tissue condition can alter the absorption rate and peak action times. Too little or too much insulin can cause hyper- or hypoglycemic reactions, which can result in orthostatic hypotension, vertigo, and change in mental status.[1]

Note

1. Mycek MJ, Harvey RA, Champe PC. *Pharmacology,* 2nd ed. Philadelphia (PA): Lippincott Williams & Wilkins; 2000.

Table 3. Falls Risk Assessments Identified High-Risk Patients

2006 PA-PSRS REPORTS INDICATE HIGH FALLS RISK ASSESSMENT		
Yes	18,660	(55%)
No	7,484	(22%)
Information not specified or unknown	7,738	(23%)
Total	33,882	(100%)

during the development of the falls prevention program and medication reconciliation, as well as when filling a prescription order.

Risk Reduction Strategies

Healthcare facilities may consider the following information when developing medication assessment and reassessment strategies to reduce falls risk.

Routine Assessment, Reassessment, and Reconciliation of Routine Medications

When medications are routinely assessed and reassessed in patients with falls risk, their use will be minimized whenever possible. Healthcare facilities may consider involving pharmacy staff during the development or revision of interdisciplinary falls prevention programs to address medication assessment and reassessment strategies. Pharmacist involvement assists prescribers in determining whether a lower dose of a medication or an alternate drug has less falls risk potential, considering laboratory test results (i.e., renal and hepatic function) and side effects. Further, pharmacists can assist prescribers with medication selection for patients known to be at high risk for falls. Pharmacists also review medications for increased falls risk when prescriptions orders are being filled. If providers are not knowledgeable about the contraindications for patients at high risk for falls, then the pharmacy staff may provide information to prescribers about which medications have fewer side effects.

Routine Assessment and Reassessment with Medications that Increase Fall Risk

Consider providing falls risk assessments for those patients taking certain medications that increase falls risk or harm. Involving pharmacy staff also supports prescribers and nurses in the medication reconciliation process, including assessment of medications, over-the-counter drugs, and herbal supplements. Whenever feasible, organizations could consider the use of a 24-hour pharmacy service so prescribers and nurses have access to ongoing pharmacy consultation and medication reconciliation services.[5] Hospitals may consider creating a list of high-risk medications currently in the hospital formulary and make it available to nurses, physicians, and pharmacists. These medications should be noted as high risk within computerized order entry systems.

Interdisciplinary Interventions

Reviewing all falls prevention strategies, including medications, is necessary before and after the patient falls so that realistic and appropriate changes can be made to help minimize the risk of falls. Without ongoing physician, nursing, and pharmacy involvement in the falls prevention and medication assessment and reassessment processes, failure to identify and implement necessary modifications will result in more falls because of medications. Falls prevention strategies should have a medication component associated with pharmacy review as part of a falls prevention program.[6]

Notes

1. Joint Commission. FAQs for the 2007 National Patient Safety Goals [online]. 2007 Jan [cited 2007 Nov 12]. Available from Internet: http://www.jointcommission.org/NR/rdonlyres/D4844675-25D7-4B5B-A47D-C549D939F9E5/0/07_NPSG_FAQs_9.pdf.
2. Oliver D, Daly F, Martin FC, et al. Risk factors and risk assessment tools for falls in hospital in-patients: a systematic review. *Age Ageing* 2004 Mar;33(2):122-30.
3. Centers for Disease Control and Prevention, The Merck Company Foundation. The state of aging and health in America [report online]. 2007 [cited 2007 Nov 12]. Available from Internet: http://www.cdc.gov/aging/pdf/saha_2007.pdf.
4. Perell K, Nelson A, Goldman RL, et al. Fall risk assessment measures: an analytic review. *J Gerontol A Biol Sci Med Sci* 2001 Dec;56(12):M761-6.
5. ECRI Institute. Medication safety. *Healthcare Risk Control* 2007 Nov;4: Pharmacy and medications 1:1-31.
6. Assessment of risk and use of interventions. Chapter 3. In: ECRI Institute. *Falls prevention: strategies in healthcare settings.* Plymouth Meeting (PA) ECRI Institute; 2006.

PENNSYLVANIA PATIENT SAFETY ADVISORY

This article is reprinted from the Pennsylvania Patient Safety Advisory, Vol. 5, No. 1–March 2008. The Advisory is a publication of the Pennsylvania Patient Safety Authority, produced by ECRI Institute and ISMP under contract to the Authority as part of the Pennsylvania Patient Safety Reporting System (PA-PSRS). *Copyright 2008 by the Pennsylvania Patient Safety Authority. This publication may be reprinted and distributed without restriction, provided it is printed or distributed in its entirety and without alteration. Individual articles may be reprinted in their entirety and without alteration provided the source is clearly attributed.*

This publication is disseminated via e-mail.
To subscribe, go to https://www.papsrs.state.pa.us/Workflow/MailingListAddition.aspx.

To see other articles or issues of the Advisory, visit our Web site at http://www.psa.state.pa.us.
Click on "Advisories" in the left-hand menu bar.

THE PENNSYLVANIA PATIENT SAFETY AUTHORITY AND ITS CONTRACTORS

PATIENT SAFETY AUTHORITY
An Independent Agency of the Commonwealth of Pennsylvania

The Patient Safety Authority is an independent state agency created by Act 13 of 2002, the Medical Care Availability and Reduction of Error ("Mcare") Act. Consistent with Act 13, ECRI Institute, as contractor for the PA-PSRS program, is issuing this publication to advise medical facilities of immediate changes that can be instituted to reduce Serious Events and Incidents. For more information about the PA-PSRS program or the Patient Safety Authority, see the Authority's Web site at www.psa.state.pa.us.

ECRI Institute
The Discipline of Science. The Integrity of Independence.

ECRI Institute, a nonprofit organization, dedicates itself to bringing the discipline of applied scientific research in healthcare to uncover the best approaches to improving patient care. As pioneers in this science for nearly 40 years, ECRI Institute marries experience and independence with the objectivity of evidence-based research. More than 5,000 healthcare organizations worldwide rely on ECRI Institute's expertise in patient safety improvement, risk and quality management, and healthcare processes, devices, procedures and drug technology.

ISMP

The Institute for Safe Medication Practices (ISMP) is an independent, nonprofit organization dedicated solely to medication error prevention and safe medication use. ISMP provides recommendations for the safe use of medications to the healthcare community including healthcare professionals, government agencies, accrediting organizations, and consumers. ISMP's efforts are built on a non-punitive approach and systems-based solutions.