Quality Improvement in a Medium-Sized, Non-Academic Health System:

Pharmacist Medication Profile Review to Decrease Hazardous Falls and Improve Patient Quality of Care

INTRODUCTION/BACKGROUND

Quality improvement efforts in health systems often address common causes of morbidity and mortality. Falling is a major cause of morbidity and mortality in elderly Americans. Various organizations concerned with quality (e.g.., National Committee for Quality Assurance, National Quality Forum, American Geriatrics Society) have established core measures or standards for screening and assessing the risk for and preventing falls in patients 65 years of age or older. Every year, more than one third of adults 65 years of age or older fall, and 20% to 30% of these individuals suffer moderate or severe injury (e.g., hip fracture, head trauma) that can impair their independence and quality of life and increase the risk of early death. The risk of serious injury in a fall increases with age. In 2005, approximately 15,800 Americans 65 years of age or older died from fall-related injuries, roughly 1.8 million elderly persons were treated in emergency departments for nonfatal injuries from falls, and more than 433,000 of these patients were hospitalized. In 2000, the direct medical costs amounted to $0.2 billion for fatal falls and $19 billion for nonfatal fall injuries.

Medications are a contributing factor in many falls. Falls may be associated with the use of prescription or nonprescription medications that cause sedation, dizziness, postural disturbances, altered gait and balance, or impaired cognition. Many elderly persons take multiple medications, and drug interactions may contribute to falls. Medication profile review by a pharmacist has the potential to identify opportunities to modify drug therapy and reduce the risk for medication-related falls in elderly patients.

Table 1: Medication Fall Risk Scoring System[a]

AHFS Pharmacologic-Therapeutic Classification	Risk for Falls	Points	Mechanism for Falls
Analgesics, antipsychotics, anticonvulsants, benzodiazepines	High	3	Sedation, dizziness, postural disturbances, altered gait and balance, impaired cognition
Antihypertensives, cardiac drugs, antiarrhythmics, antidepressants	Intermediate	2	Orthostasis, impaired cerebral perfusion, poor health status
Diuretics	Low	1	Increased ambulation, orthostasis

AHFS = American Hospital Formulary Service

[a]A score of 6 or higher for a patient suggests an increased risk for falls and triggers evaluation of the patient (i.e., fall risk evaluation)

Many pharmacists at small- and medium-sized community hospitals find daunting the task of implementing quality improvement initiatives because they lack the staff and resources of larger academic medical centers. Burl G. Beasley, B.S. Pharm., M.P.H., Medication Safety Coordinator at Mercy Health Center, Oklahoma City, Oklahoma, a 351-bed, full-service, tertiary-care, community hospital (Figure 1) was not intimidated in his quest to improve patient safety. In 2005, Mr. Beasley and Edna Patatanian, Pharm.D., Associate Professor, Department of Pharmacy Practice, Southwestern Oklahoma State University College of Pharmacy, designed and implemented a pharmacy-based fall prevention program (PFPP) to reduce the risk of falls at Mercy Health Center. This facility serves a six-county area with a population of more than 1 million people. The hospital already had a falls and restraints program, but medication profile review by pharmacists was not part of that program. Appointment of clinical pharmacists to the Falls and Restraints Committee provided the opportunity to develop the PFPP. According to Mr. Beasley, fall prevention through medication review was chosen for pharmacy-based quality improvement efforts because "it represents low-hanging fruit that can be readily addressed and have a substantial impact on health."

The PFPP involves classification of medications by fall risk, daily review by pharmacists of patient medication profiles, and assessment of adherence to the pharmacy fall prevention policy. Beasley and Patatanian researched the availability of risk scoring systems for medications that increase the risk for falls but were unable to identify a standardized system, so they developed their own risk scoring

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Table 2. Types of Recommendations to Reduce the Risk for Medication-Related Falls

- Discontinue medication
- Decrease the dosage
- Use an alternative therapeutic agent
- Monitor laboratory values
- Educate the patient on how to minimize the risk of falls

system (Table 1). The scoring system assigns a weighted point value for each of various AHFS Drug Information pharmacologic-therapeutic classifications known to increase the risk for falls. A medication fall risk score is calculated using the patient medication profile, with a score of 6 or higher suggesting an increased risk for falls and triggering evaluation of the patient (i.e., fall risk assessment).

A list of patients at risk for falling is created using the medication fall risk score and a nursing fall assessment score. Patients are added to this list as appropriate at the time of admission or certain medication changes. The list is printed and reviewed on a daily basis by clinical pharmacists assigned to and responsible for various areas of the medical-surgical floors. These pharmacists make drug therapy recommendations to reduce the risk for medication-related falls (Table 2); the recommendations are entered directly into the patient medical record. A variety of factors are taken into consideration in making these recommendations (Table 3).

In the course of a 3-month period in 2005, 498 patients at risk for falls were identified and assessed. The average patient age was 75 years. The number of patients reviewed per day was 2.3. In 2006, the average number of patients reviewed per day increased to 3.7. This figure increased sharply to 10.6 patients per day in 2007, when a total of 3853 patients were evaluated.

The PFPP was part of a multidisciplinary initiative to reduce harm from patient falls, with some benefit demonstrated from non-pharmacy-related interventions before PFPP implementation in late 2005. The period from July 2004 through September 2005 before PFPP implementation was compared with the period from October 2005 through December 2007 after PFPP implementation to assess the impact of the pharmacy-based component of the initiative. The overall rate of injury from falls was 44% lower after PFPP implementation compared with before implementation (Figure 2). The overall total rate of falls decreased by 36% in the same time frame (Figure 3). These reductions were greater than the declines that were forecast based on trends observed before PFPP implementation, reflecting a substantial impact of the PFPP.

Preventing falls and associated injuries resulted in a cost savings of approximately $217,000 per year at Mercy Health Center. This figure takes into consideration the cost of pharmacist time spent conducting daily patient medication profile reviews.

Burl G. Beasley, B.S. Pharm., M.P.H.

The greatest impact of the PFPP has been increased clinical pharmacist involvement in patient profile review and patient counseling. Hospitalized patients receive face-to-face counseling by clinical pharmacists about the increased risk for falling from certain medications. Patients gain a better understanding of the potential role of medications in falls.

Table 3. Considerations in Fall Risk Evaluation for Elderly

Type of medication
- inclusion in list of drugs meeting Beer's criteria for potentially inappropriate drugs for the elderly
- drugs requiring dosage adjustment in patients with renal impairment or certain disease states
- drugs with propensity for overuse
- drugs administered parenterally

Need for laboratory monitoring
- therapeutic drug monitoring (digoxin, phenytoin)
- international normalized ratio
- electrolytes
- hemoblobin/hematocrit

Disease states
- hypertension
- congestive heart failure
- diabetes mellitus
- dementia

Orthopedic surgery

Prior fall

Education
- ability/willingness to learn
- mental status

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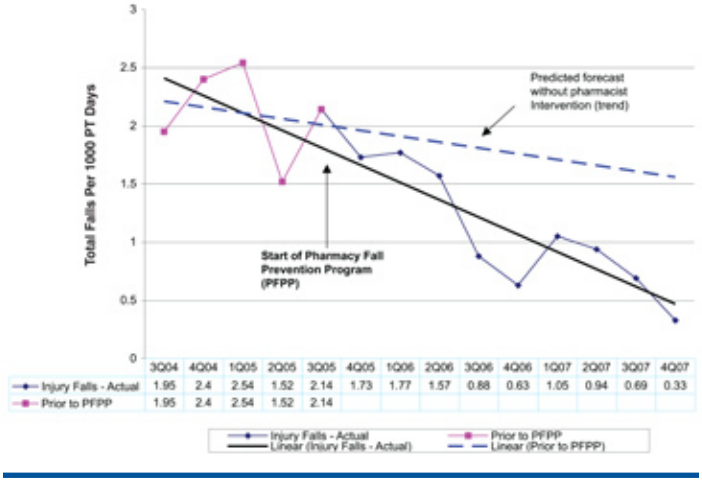
Working relationships between pharmacist, physicians, nurses, and other healthcare professionals have improved as a result of the PFPP. Awareness of the association between physician prescribing, nursing assessment, and pharmacy medication review as it relates to the risk of hazardous falls increased.

Mercy Health Center received a 2007 CHEERS Award from the Institute for Safe Medication Practices for its unique multidisciplinary fall prevention program. This award acknowledges institutions that have set a standard of excellence for others to follow in the prevention of medication errors and other adverse events. Mercy Health Center also was a finalist for the 2007 Award for Excellence in Medication-Use Safety from the ASHP Research and Education Foundation; this award recognizes on a national level pharmacy professionals who have assumed a leadership role in promoting safety in the medication-use process. Beasley and Patatanian received a 2008 ASHP Best Practices Award in Health-System Pharmacy for their role in the PFPP. According to Beasley, "the recognition associated with these awards has led to many inquiries about our program from pharmacists practicing all over the United States. The approach that we used is versatile and suitable for a variety of healthcare settings, such as nursing homes, other long-term care settings, and even managed care settings."

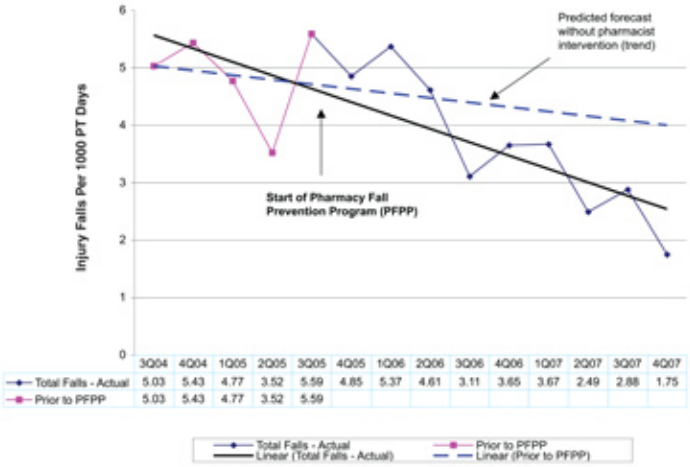
As an integral part of a multidisciplinary approach to reduce patient harm from falls, the PFPP produced substantial results in a relatively short time frame. The experience with the PFPP at Mercy Health Center illustrates the feasibility and potential impact of pharmacist involvement in quality improvement strategies in health systems that are not large, academic medical centers.

Figure 2. Injury Falls per 1,000 Patient Days



	3Q04	4Q04	1Q05	2Q05	3Q05	4Q05	1Q06	2Q06	3Q06	4Q06	1Q07	2Q07	3Q07	4Q07
Injury Falls - Actual	1.95	2.4	2.54	1.52	2.14	1.73	1.77	1.57	0.88	0.63	1.05	0.94	0.69	0.33
Prior to PFPP	1.95	2.4	2.54	1.52	2.14									

Figure 3. Total Falls per 1,000 Patient Days



	3Q04	4Q04	1Q05	2Q05	3Q05	4Q05	1Q06	2Q06	3Q06	4Q06	1Q07	2Q07	3Q07	4Q07
Total Falls - Actual	5.03	5.43	4.77	3.52	5.59	4.85	5.37	4.61	3.11	3.65	3.67	2.49	2.88	1.75
Prior to PFPP	5.03	5.43	4.77	3.52	5.59									

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