

## Acceptance Rates for Pharmacist-Initiated Interventions in Long-Term Care Facilities

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### Abstract

**Objectives:** Describe individualized medication interventions, categorize intervention types, and report acceptance rates by prescribers following a pilot medication intervention program in which a pharmacist rounded with the patient care team in long-term care facilities in addition to their traditional medication regimen review (MRR) process.

**Design:** Prospective Chart review

**Setting:** Two primary long-term care (LTC) facilities

**Participants:** Fifty randomly selected patient charts. Inclusion criteria were adult patients (18 years old or older) residing in one of the LTC facilities receiving consultant pharmacist services. Patient charts not meeting inclusion criteria were excluded from the review.

**Interventions:** Recommendations made according to the needs of each patient and categorically reported.

**Main Outcome Measures:** Intervention acceptance rates by prescribers and aggregate reporting for type of medication interventions.

**Results:** For 50 patient charts (68% female, 32% male) 66 interventions were reported. The average patient age was 81.5 years. Approximately 45% of the interventions pertained to drug utilization concerns, and 21% involved pain management. Additional categories included treatment of eye and skin conditions and pharmacotherapy for mental health. A 'nonpharmacotherapy' designation was given to individual interventions not fitting into a larger category. New medications and regimen changes were the most common medication therapy outcomes (42% and 32%, respectively). Overall 92% of all pharmacist interventions were either fully or partially accepted by the prescriber where partial acceptance was defined as implementation of the recommendation with an adjustment. Interventions related to drug utilization or pain management each approached a 93% acceptance rate.

**Conclusions:** The consultant pharmacist provided personalized recommendations following extensive chart review and patient assessment. Our chart review suggests that high prescriber acceptance rates along with medication therapy optimization may produce similar benefits in other LTC facilities.

### Introduction

Two-thirds or 32% of Medicare beneficiaries have two or more chronic conditions; 23% have four to five chronic conditions, and 14% have six or more according to 2010 data from the Centers for Medicare and Medicaid Services.<sup>1</sup> Maintaining adequate control of chronic medical conditions by evaluating the therapeutic outcome is of value in the long term care (LTC) setting. Chronic disease states with specific clinical practice guidelines, including diabetes, hypertension, and stroke, are highlighted in a recent study as common diagnoses among LTC patients.<sup>2</sup> Adherence to these guidelines is extremely important for managing these diseases. Patients receiving disease state management services by pharmacists are four to seven times more likely to

be within clinical practice guideline recommendations compared to those who did not receive pharmacist-driven services.<sup>2</sup>

With age, changes in protein binding, renal and hepatic functions, drug metabolism and excretion, and drug distribution increase the potential for adverse drug reactions (ADRs), defined as unintended responses to a drug and toxic effects of certain drugs.<sup>3</sup> Increased longevity also increases the potential for unnecessary drug exposure unless the medication regimen is evaluated to determine if more effective pharmacotherapy could be implemented.<sup>4</sup> Inappropriate medication therapies can lead to increased healthcare costs including more emergency department (ED) visits from ADRs and hospitalizations due to inappropriate care.<sup>5</sup> Pharmacists can play an active role detecting problems and recommending appropriate use of medications, particularly with polypharmacy in the elderly.

One study suggested that a medication review by a pharmacist resulted in a reduction in the number of

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prescribed medications to nursing home patients. These findings reinforce the value of implementation of this simple, low-cost intervention. In addition, pharmacist medication review had the potential to decrease costs.<sup>6</sup> Studies which measure the impact of pharmacists' medication therapy recommendations in nursing home residents have shown mixed results. Often both consultant and onsite pharmacist services may be provided making it difficult to measure outcomes from one of these services specifically, and often studies which align medication recommendation changes to decreases in falls or morbidity and mortality have shown no difference or limited differences. Increasingly evidence supports involvement of a pharmacist increases knowledge and awareness of medication-related issues for other healthcare professionals.<sup>7</sup> The value of the pharmacist medication review and inclusion as a member of an interdisciplinary care team has been recognized as improving prescribing and potentially decreasing costs.<sup>8,9</sup> Age-related changes and the positive impact of the pharmacist as a member of the interdisciplinary team have been recognized in a variety of settings as well. In an acute care geriatric unit, the addition of a clinical pharmacist resulted in 76 interventions in a 3-month period. Interventions covered areas of pharmacotherapy that included identified as drug selection, dosing, changes in therapy, and medication reconciliation.<sup>10</sup>

This chart review evaluates the outcomes associated with a pilot medication intervention program in which the pharmacist rounded with the physician and other members of the patient care team as a step in the completion of the medication regimen review (MRR). We describe the types of interventions identified, how these were resolved, and acceptance rates by prescribers at two primary care LTC facilities.

## Methods

### *Study Design*

Before initiation of the pilot medication intervention program, pharmacist services provided routinely in the long-term care (LTC) facility included medication regimen review (MRR) which consisted of identifying drug-drug interactions, dosing appropriateness, medication reconciliation to ensure that the medication administration record (MAR) matched current physician orders, and making recommendations for laboratory tests needed to monitor medication therapy. Any medication-therapy recommendations were communicated to the LTC physician by chart note. The pharmacists did not communicate directly with providers or patients as a part of their services. This new pilot medication intervention program combined the traditional MRR process with rounding activities as a member of the patient care team

during which patient-focused discussions with healthcare providers and interviews with nursing home patients would occur. If the pharmacist was not able to be present during this patient interview, he/she followed up with the patient at the first available opportunity. The patient care team was interdisciplinary and included physician, nursing, and any allied healthcare professionals working with the patient. The pharmacists rounded using a standardized intervention form that identified current patient problems or concerns and/or medication-related issues. Pharmacist recommendations for resolution of these issues were included on the form. The pharmacist would present the medication-related issues to the team during the rounding process. Clinical interventions included, but were not limited to, addressing reports of current ailments, any difficulties taking medication (i.e., tablet size or dosage form), and/or adverse effects related to current medication therapy. In addition, persons providing patient care were queried on any changes in the environment or other patient-specific variables that may have occurred since the team last rounded.

The chart review was conducted on 50 randomly selected patient charts of persons residing in two LTC facilities receiving contract clinical pharmacist consulting services in which this pilot medication intervention program was being implemented. Charts were reviewed by a pharmacy intern-researcher to collect, analyze, and categorize data about types of interventions, acceptance rates, and categories of pharmacist-initiated intervention recommendations using a data collection form. Intervention acceptance rates were categorized as accepted, partially accepted, or not accepted. Interventions were classified by type of patient problem addressed. After identification, interventions related to medications were identified as starting a new medication, changing existing medication, discontinuing a medication, or no change in medication therapy. Approval from the Institutional Review Board (IRB) was obtained for this project.

For the purposes of this chart review, an intervention was defined as any recommendation given by the pharmacist to alleviate a patient problem identified during interdisciplinary collaboration. An example would be recommending reduction of a resident's medication dose due to a recent fall or initiation of an antidepressant for a resident that reported crying daily (ruling out pain as a contributing factor). Interventions were submitted to the prescriber for review as either a chart note or during the interdisciplinary meeting. Either a chart note from the physician or a response on the intervention form was used to determine the acceptance of the pharmacist intervention. If the intervention was not accepted, the prescriber documented his/her rationale. An

alternative plan to address the problem may or may not have been included by the physician on the intervention form.

#### *Statistical Analysis*

A database was created with categorical information for analysis that included patient date of birth, age, ethnicity, gender, disease states, reported problem(s), medication therapy interventions, and intervention acceptance. Statistical methods included nominal and aggregate reporting.

### **Results**

#### *Patient Demographics*

The patient demographics of the charts reviewed (n=50) are described in Table 1. The most common disease states represented during the chart reviews were hypertension, dementia, depression, gastroesophageal reflux disease (GERD), and pain.

#### *Intervention Characteristics*

Among the 50 patient charts reviewed, 66 interventions were made. Interventions were divided into five categories according to the type of patient problem identified. These categories included [1] drug utilization, [2] pain management, [3] nurse or patient administered treatment of eye or skin conditions, [4] pharmacotherapy for mental health, and [5] nonpharmacotherapy for interventions that did not fit into a larger category. The drug utilization category interventions included addressing subtherapeutic or supratherapeutic doses, unnecessary medications, unwanted side effects, and drug-drug interactions. Pharmacist recommendations targeting these patient-specific areas, the degree to which these recommendations were accepted, and resolution of these problems were the foci of our chart review. Table 2 summarizes the results.

Interventions addressing drug utilization represented the most common type in this chart review. Approximately 45% of the total interventions (n=66) were related to drug utilization. Pain management was addressed in 21% of the pharmacist interventions. Pain management problems identified included uncontrolled pain in specific areas of the body (i.e., joint, back, nerve, and headache) as well as generalized pain. Inadequate pain control was reported in 14 patient charts. Recommendations for eye or skin related conditions represented 12% of the interventions made. Depression, dementia, and aggressive behaviors reported in the absence of pharmacotherapy represented the pharmacotherapy for mental health interventions. These interventions were made in five patient charts (8% of total interventions). The 'nonpharmacotherapy' interventions contained concerns unrelated to any of the previous

categories (i.e., sinus congestion, excessive salivation, or dry mouth) and represented 14% of the interventions made.

#### *Medication-Related Problem Resolution Categories*

Interventions resulted in four different medication problem resolution categories. These included [1] new medication initiation, [2] existing medication discontinuation, [3] current medication dose or regimen adjustment, and [4] reviews without changes. Results are summarized in Table 3. Forty-two percent of all interventions involved initiating a new medication to resolve patient-specific concern(s). The second most common category was existing medication discontinuation, representing 32% of the interventions. This was followed by current medication dose or regimen adjustment, and reviews without changes (17% and 9%, respectively).

Special attention was given to the addition of pharmacotherapy to an existing regimen. Recommendations for medication changes and interventions consistently sought to identify medication(s) and medication classes with the potential for severe adverse effects and negative outcomes in older adults.<sup>11</sup> Examples included the recommendation to add a stimulant laxative to the resident's medications after a routine narcotic for pain management was ordered by the primary care provider. Specific to this pilot medication intervention program was an in-depth review of the bowel and bladder protocols for patients on opioids or regimens associated with constipation, and any changes that were documented after pharmacist-initiated patient-specific recommendations. In addition, if residents were requesting an 'as needed' analgesic ordered on a routine basis, these were addressed with a dosage adjustment, keeping the 'as needed' orders in case of breakthrough pain.

#### *Intervention Acceptance*

Intervention acceptance was categorized as accepted, partially accepted, or not accepted by the prescriber. If the pharmacist's recommendation was implemented exactly as written on the intervention form, it was considered accepted. Partial acceptance was defined as implementation of the pharmacist's recommendation with a minor change. For example, if the pharmacist recommended a gabapentin dose increase with a specific dose and administration schedule. The prescriber partially accepted this recommendation by accepting the schedule but increased the dosing beyond the recommendation. If the prescriber disagreed with the pharmacist's recommendation, the intervention was considered 'not accepted.' For these charts, the prescriber either documented an alternative plan of action or no change in current therapy was made. Tables 4 and 5 summarize the results.

There was an acceptance rate of 92% for full or partial acceptance of pharmacist interventions by prescribers in this chart review: 88% accepted, 4% partially accepted. Only 8% of the interventions were not accepted. Among the drug utilization and pain management categories 93% of the recommendations were accepted. Approximately 88% of the 'nonpharmacotherapy' interventions and 89% of the nurse or patient administered treatment of eye or skin conditions interventions were accepted. One hundred percent of the pharmacotherapy for mental health interventions was accepted by prescribers.

### Discussion

Our medication intervention program is unique in that it exceeded all state and federal requirements for monitoring and adds a focus on individualized interventions. Support for individualized patient-focused interventions was recommended by Clark et al. who advocated moving the MRR to a more focused approach with occasional visits to the patients.<sup>12,13</sup> This pilot medication intervention program was undertaken to provide individualized patient recommendations based on the medication regimen matched to the activities of daily living, functional status, and patient-specific information. Specific patient concerns were addressed at each visit, and focused information targeting a specific area of concern was addressed. If the clinical pharmacist was not available, other healthcare professionals gathered the information for pharmacist review and follow-up.

This chart review provided valuable information about pharmacist interventions in LTC facilities. The results suggested the pilot medication intervention in which consultant pharmacists had multi modal approach towards MRR had a positive impact in the LTC setting. This was evidenced by the changes made to the medication therapy regimens and the high prescriber acceptance rate of the pharmacist's recommendations. The consultant pharmacist focused on each patient in addition to monitoring medication usage facility-wide.

With drug utilization and pain management issues being the most common in this LTC setting, it was valuable that the pharmacist was able to optimize patient medication therapy regimens. Pharmacist-initiated changes resolved unwanted side effects, eliminated unnecessary medications, reduced drug-drug interactions, corrected dosing, and managed pain more effectively. How these recommendations, if implemented, changed these patient outcomes, with longitudinal follow-up with these patient charts, is an area for further investigation, particularly with respect to incidences

of ADRs or adverse drug events (ADEs) and therapeutic outcomes.

The potential for untoward drug use consequences was considered with each recommendation. ADRs are unintended responses to a drug that are toxic occurring at normal therapeutic doses, whereas ADEs are any injury resulting from the use of a drug which includes ADRs, overdoses, and any other harm from the use of the drug.<sup>3</sup> One study of geriatric outpatients who had received a pharmacist medication consult found when comparing ADRs at baseline and at 2 months, ADRs originally reported at baseline decreased in the intervention group compared to the control group.<sup>14</sup> Another study reported that 30% of patients receiving a pharmacist intervention reported ADEs compared to 42% in the control group, although this was not statistically significant.<sup>15</sup> The review article that looked at medication reconciliation in the transfer of patients from outpatient settings to LTC settings stated that preventable ADEs at transition points accounted for approximately 50% of all medication errors. These events, ADEs and ADRs, were associated with frequent ED visits and hospitalizations, leading to increased healthcare costs.<sup>16-18</sup> In transitions to LTC settings, pharmacists may be a cost-effective way to address costs and improve patient outcomes.

Our acceptance rate of 92% is comparable to physician acceptance in other settings.<sup>19,20</sup> This suggests that pharmacists can have the same impact in LTC facilities as in outpatient clinical settings. The high acceptance rate in our study implies that pharmacists are trusted by prescribers to make appropriate decisions regarding drug therapy which could also translate to a savings in healthcare costs. The majority of medication outcomes resulted in starting a new medication or changing the dose of a current medication to resolve a patient-specific concern. In the absence of a pharmacist, a patient would be required to make an appointment with a prescriber to reconcile this issue. Pharmacists may be able to reduce costs by working in conjunction with prescribers to enhance medication therapy management. In addition, discontinuing a medication due to an ADE or lack of indication would not only result in direct savings, but it may also reduce the need for hospitalizations due to ADRs and ADEs.

### Limitations

This chart review had several limitations. The first was a small sample size. With only 50 patient charts from two different facilities, the results cannot be generalized to the entire patient population in the LTC. Secondly, not all information may have been recorded in the chart or on the intervention form and, if not present for interactions, was dependent on

charted information. Reporting may have been variable depending on who recorded the patient information (i.e., pharmacist, physician, nursing staff, or allied healthcare professional). The potential for bias is acknowledged.

### Conclusion

Traditional activities of the consulting pharmacist (whereby the consultant reviews the patient's chart, verifies the lab results, performs any dosage adjustment calculations needed, and ensures correct transcription of the medication regimen to the medication administration record) can be carried out without direct patient or healthcare team contact. This medication intervention program initiative included introduction of a standardized intervention form, direct contact with the team (particularly rounding with the team), and whenever possible, hearing patient concern(s), and discussing findings with the prescriber. Direct pharmacist-prescriber contact provided an opportunity to demonstrate the value of the pharmacist as a team member for patient-centered care and work one-on-one with the prescriber.

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Table 1: Patient Demographics

Variable	Representation in Sample
Gender	Female: 68% Male: 32%
Age	Range: 59 to 97 years of age Mean: 81.5 years
Caucasian	84%
African-American	6%
Hispanic	2%
American Indian	8%

Table 2: Types of Pharmacist Interventions

Intervention Type	Number of Interventions (%)
Drug Utilization*	30 (45)
Pain Management	14 (21)
Nurse or Patient Administered Treatment of Eye or Skin Conditions	8 (12)
Pharmacotherapy for Mental Health	5 (8)
Nonpharmacotherapy	9 (14)
Dislikes taste of crushed medication (2)	
Dry mouth (2)	
Excessive saliva (1)	
Medication too large to swallow comfortably (1)	
Sinus congestion (1)	
Unable to reach water (1)	
Unable to see television (1)	
Total	66 (100)

\*The drug utilization category includes drug use evaluation, medication use evaluation, and medication use management addressing subtherapeutic or supratherapeutic doses, unnecessary medications, unwanted side effects, and drug-drug interactions.

**Table 3: Types of Problem Resolutions**

Problem Resolution Categories	Number of Interventions (%)
New medication initiation	28 (42)
Existing medication discontinuation	21 (32)
Current medication dose or regimen adjustment	11 (17)
Reviews without changes	6 (9)
Total	66 (100)

**Table 4: Intervention Acceptance**

Intervention Acceptance	Number of Interventions (%)
Accepted	58 (88)
Partially Accepted	3 (4)
Not Accepted	5 (8)
Total	66 (100)

**Table 5: Intervention Acceptance by Type**

Intervention Type	Number of Interventions		
	Full Acceptance (%)	Partial Acceptance (%)	Not Accepted (%)
Drug Utilization	27/30 (90)	1/30 (3)	2/30 (7)
Pain Management	13/14 (93)	0/14 (0)	1/14 (7)
Nurse or Patient Administered Treatment of Eye or Skin Conditions	5/8 (63)	2/8 (25)	1/8 (12)
Pharmacotherapy for Mental Health	5/5 (100)	0/5 (0)	0/5 (0)
Nonpharmacotherapy	8/9 (89)	0/9 (0)	1/9 (11)
Total	58/66 (88)	3/66 (4)	5/66 (8)