Assessing the Effectiveness of a Consultant Pharmacist-Led Opioid Stewardship Protocol in Skilled Nursing Facilities

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BACKGROUND: More than 1.4 million adults in the United States live in skilled nursing facilities (SNFs). Opioids are prescribed to approximately 60% of skilled nursing residents, a primarily older patient population. Current opioid prescribing guidelines may be difficult to extrapolate to this population because of pain burden and extensive analgesic use. Furthermore, in the older population, opioids are associated with greater frequency of adverse events with potential for hospitalization and increased all-cause mortality.

OBJECTIVE: Evaluate the impact of a consultant pharmacist-led opioid stewardship protocol on patient pain-related outcomes in SNFs.

METHODS: An opioid medication management protocol was implemented by consultant pharmacists at participating SNFs. Consultant pharmacists assessed facility residents for active opioid orders and systematically evaluated use and appropriateness of therapy. Facility data pre- and post-implementation of the protocol was compared to determine effectiveness. The primary outcomes included rate of recommendation acceptance, rate of as-needed (PRN) opioid utilization, and number of residents who experienced a fall.

RESULTS: A total of 114 patients were included in the study. The percentage of patients utilizing opioid therapy pre-intervention was 78.1% and 74.6% post-intervention (P = 0.29; 95% CI 0.033-1.864). Patient pain scores decreased from an average of 3.7 to 3.2 (P < 0.01). Use of PRN opioid orders transitioned from 84.2% to 71.9% (P = < 0.01; 95% CI 0.055-0.675).

CONCLUSION: This study revealed significant reductions in average patient pain scores and reduction in PRN opioid medication utilization, overall emphasizing the positive impact of consultant pharmacist involvement in opioid stewardship within the skilled nursing setting.

KEYWORDS: Consultant pharmacist, Opioid stewardship, Pain management, Skilled nursing facility.

ABBREVIATIONS: ADE = Adverse drug event, CI = Confidence interval, EHR = Electronic health record, MAR = Medication administration record, MRR = Medication regimen review, PRN = As needed, SNF = Skilled nursing facility.

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Introduction

More than 1.4 million adults in the United States live in skilled nursing facilities (SNFs), including the most vulnerable patient populations: advanced age and individuals with moderate to severe cognitive incapacity and/or functional impairment.[1] Among patients older than 65 years of age, the use of opioids is associated with an increased frequency of fractures, adverse drug events (ADEs), hospitalization, and higher all-cause mortality.[2] Additionally, the Institute of Medicine identified SNFs as the most common location for medication errors, estimating about 800,000 prescription-related errors annually.[3] A Veterans Health Administration analysis of skilled nursing units also noted opioids to be the agents most likely to cause adverse events.[4]

SNF residents have an increased propensity for multiple comorbidities, poly-pharmacy, and baseline frailty coupled with an approximately 60% opioid prescribing rate nationally.[5] Current opioid prescribing guidelines may be difficult to extrapolate to this unique population because of burden of pain and concurrent extensive analgesic use.[6] Furthermore, limited literature exists to assist in opioid management in the skilled nursing setting.

Increased medication use and the potential for medication errors, and ADEs coupled with limited resources illustrate the challenges in pain management and potential need for pharmacist involvement. The purpose of this institutional review board-approved prospective observational study was to evaluate the effectiveness of a consultant pharmacist-led opioid stewardship protocol on pain management outcomes in the skilled nursing setting. The primary objectives of this study were to evaluate the impact of a pharmacist-led opioid stewardship protocol on the percentage of patients within a SNF receiving opioid medications as well as the impact on patient-reported pain scores. Secondary objectives included the acceptance of pain management-related pharmacist recommendations, as needed (PRN) opioid utilization, number of patients receiving opioid medication that experienced a fall, opioid monotherapy prescribing rates, and use of adjuvant pain medication among patient pre- and post-introduction of pharmacist-led protocol.

Methods

Setting

This study took place in three Medicare- and Medicaid-certified SNFs located in the Midwest region of the United States from September 2021 to June 2022. Each facility included in the study consisted of short-term and long-term units, totaling 524 beds collectively.

Intervention

Prior to inclusion of study participants, consultant pharmacists completed opioid stewardship training and study protocol review. Consultant pharmacists utilized an electronic health record (EHR) report to identify residents for potential study inclusion. Once identified, pharmacists systematically evaluated the utilization and appropriateness of each patient's current opioid therapy as part of the monthly medication regimen reviews (MRR). Pharmacists then made recommendations based on clinical judgment and current pain management guidance from the American Geriatrics Society Panel on the Pharmacological Management of Persistent Pain in Older Persons.[8]

Inclusion criteria for this study were: patients residing at one of the three SNFs with an active opioid medication order and whose charts were accessible through EHR. Patients with no active pain medication orders on the EHR were excluded. Consultant recommendations written for opioid therapy adjustments, or adjuvant therapy adjustments, were directed to prescribers and categorized as an Opioid Stewardship Recommendation in consultant software. Adjuvant pain medications were defined as nonopioid oral analgesics (acetaminophen/nonsteroidal anti-inflammatory drugs), topical analgesics, gabapentinoids, and antidepressants (serotonin and norepinephrine reuptake inhibitors [SNRI] and tricyclic antidepressants [TCAs]) with indication for pain management. Recommendations made for medication administration or medication direction changes were directed toward nursing and categorized as MRR in the consultant software.

After pharmacist recommendations were written, the MRR report was sent to facility personnel and distributed to the corresponding prescribers. The physicians responded to pharmacist recommendations based on their clinical judgment, and follow-up was recorded at the next monthly assessment.

Data Sources/Measurement

Baseline demographics were collected for each patient enrolled. Opioid and adjuvant pain medications use were evaluated at time of enrollment and after protocol initiation. Patient reported pain scores were averaged to a daily score and reported on a Likert scale from 0 to 10. Baseline demographic data collected from EHR included age, gender, hospice/palliative/oncology designation, average pain scores, active opioid medications, and active adjuvant pain medications. Primary outcomes were collected during monthly MRR. Secondary outcomes were also assessed at 30-day follow-up.

Study Size

With the alpha value was set *a priori* to 0.05; a sample size of 96 was required to achieve 80% power.

Statistical Methods

For the primary outcomes, McNemar's test was used to describe the change in percentage of patients receiving opioid medications pre- and post-recommendation, and Wilcoxon Signed Rank test was used to assess changes in pain scores pre- and post-recommendation. McNemar's test was also used to describe the secondary outcomes: the acceptance rate of pain management-related pharmacist recommendations, PRN opioid utilization, falls, opioid monotherapy, and adjuvant pain medication use.

Results

Baseline Characteristics

During the study period from September 2021 to June 2022, 152 patients were enrolled in the study, and 114 patients met the inclusion criteria. Of study participants, 73.7% were female with a mean age of 78 years (range: 53 to 100 years). Before pharmacist intervention 78.1% had opioid therapy on profile and 90.4% had an adjuvant pain medication on profile (Table 1). Hospice/palliative/oncology patients comprised 30.7% of study population, and a total of 38 patients were lost to follow-up because of discharge prior to the 30-day follow-up period.

Primary Outcomes

The main purpose of the study was to evaluate potential pharmacist impact in pain management for patient- and facility-level outcomes. Over the course of the study, opioid utilization transitioned from 78.1% to 74.6% after initiation of opioid stewardship protocol ($P = 0.20$; 95% CI 0.033-1.86) (Table 2). Patient pain scores decreased from an average of 3.7 to an average of 3.2 post-pharmacist intervention ($P < 0.01$) (Table 2). Of the total population, 11 patients were unable to be included in pain score calculations. This was because of lack of consistent documentation in EHR or patient discharge prior to follow-up. Of the 11 patients without documented pain scores, 6 had hospice/palliative/oncology designation and 5 did not meet study inclusion criteria.

Secondary Outcomes

For secondary outcomes, there were a total of 88 pharmacist recommendations written over the course of the study. Of these recommendations, 40.9% (36/88) focused on appropriate use of opioid medications. These recommendations addressed opioid dose adjustments based on renal function, initiation of scheduled opioid therapy, and discontinuation of unused PRN opioids. Other recommendations written focused on adjustments to existing adjuvant pain medications (16/88), addition of new adjuvant pain medications (14/88), and EHR documentation updates (22/88). Documentation recommendations were directed to nursing and targeted at completion of pain score documentation at time of medication administration. The acceptance rate by providers for pharmacist recommendations was 65.9% (58/88) (Table 3). The remaining 30 recommendations were classified as not accepted. These recommendations were either declined by the prescriber with rationale (10/30) or declined without rationale (20/30).

Prior to pharmacist intervention, 84.2% (96/114) of patients were requiring doses of their active PRN opioid medications. After pharmacist intervention PRN usage decreased to 71.9% (82/114) of patients ($P < 0.01$; 95% CI 0.055-0.675) (Table 3). Of the total population for study duration, 11 patients had a recorded fall pre-intervention, and 10 patients had a fall recorded

Table 1. Baseline Characteristics

Characteristic	Total Population (N = 114)
Mean age—years (range)	78 (53-100)
Female gender—no. (%)	84 (73.7)
Hospice, palliative care, or oncology designation—no. (%)	35 (30.7)
Utilizing opioid order—no. (%)	89 (78.1)
Adjuvant pain medications—no. (%)	103 (90.4)

Table 2. Primary Outcome Results

Primary Outcome	Pre-Recommendation	Post-Recommendation	*P*-Value	95% Confidence Interval
Patients w/—opioid medication orders—no. (%)	89 (78.1)	85 (74.6)	0.2888	0.033–1.864
Average pain scores—mean (SD)	3.7 (2.21)	3.2 (2.10)	< 0.00001	N/A

Table 3. Secondary Outcomes Results

Secondary Outcome	Pre-Recommendation	Post-Recommendation	*P*-Value	95% Confidence Interval
Recommendations written—no.	N/A	88	N/A	N/A
PRN opioid utilization—no. (%)	96 (84.2)	82 (71.9)	0.0056	0.055–0.675
Residents who experience a fall—no. (%)	11 (9.6)	10 (8.8)	1.0000	0.324–2.464
Opioid monotherapy—no. (%)	11 (9.7)	5 (4.4)	0.0412	N/A

after the intervention (*P* = 1.00; 95% CI 0.324-2.464). Additionally, 9.7% (11/114) of patients received opioid monotherapy pre-intervention compared with 4.4% (5/114) of patients post-intervention (*P* = 0.0412) (Table 3). A total of 35% (40/114) participating patients had "no recommendations" or change to pain medications at time of pharmacist review.

Discussion

According to a recent study conducted by Chen and colleagues,[6] pharmacists provided positive pain management interventions for hospitalized patients in an urban teaching hospital. These interventions consisted of optimizing or adding nonopioid therapy, adding a bowel regimen, and decreasing opioid dose or frequency. Similarly, in this study, pharmacists created positive interventions resulting in decreased use of PRN opioid orders and decreased average pain scores. These outcomes indicate fewer incidences of uncontrolled pain requiring PRN usage and efficacious responses to appropriately titrated medications.

There is potential for consultant pharmacists to positively impact pain management outcomes in the skilled nursing setting. This study revealed a statistically significant reduction in average pain scores post-pharmacist recommendation as well as a clinically significant reduction in PRN opioid medication use secondary to optimization of scheduled opioid therapy and use of adjuvant pain therapies. This study also showed statistically significant reductions in the number of patients receiving opioid monotherapy post-pharmacist intervention. This further reenforces the added value of consultant pharmacist clinical

interventions as contributing to improved pain management via multimodal pain therapy in the skilled nursing setting.

Limitations of the study include the small number of participating SNFs. Future directions would increase patient population and location diversity via increased facilities participation. Another limitation was lack of prescriber response to pharmacist recommendations. Post 30-day recommendation follow-up was recorded during this study period. Prescribers may not have acknowledged the recommendation until 60 to 90 days post-recommendation, which resulted in categorization of "no response." Additionally, inclusion of short- and long-term SNF patients would be reduced to long-term stay patients. Short-term patients would be excluded because of potential of discharge prior to 30-day follow-up, or follow-up window would be shortened to 15 days.

Conclusion

The use of the opioid stewardship protocol by consultant pharmacists led to a statistically significant decrease in patient pain scores, a decrease in the number of as-needed opioid doses administered, and decreased prevalence of opioid monotherapy within this vulnerable population. Ultimately, this study suggests that consultant pharmacist interventions related to opioid stewardship protocols can have a positive impact on pain management within a skilled nursing facility.

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