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Brief Report

APRN-Conducted Medication Reviews for Long-Stay Nursing Home Residents



Amy Vogelsmeier PhD, RN, FAAN*, Lori Popejoy PhD, RN, FAAN,
Charles Crecelius MD, PhD, CMD, Sabrina Orique PhD (C), RN,
Greg Alexander PhD, RN, FAAN, Marilyn Rantz PhD, RN, FAAN

Sinclair School of Nursing, University of Missouri, Columbia, MO

A B S T R A C T

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Objective: As part of the Missouri Quality Initiative (MOQI) to reduce hospitalizations for long-stay nursing home residents, this article describes reasons MOQI advanced practice registered nurses (APRNs) recommended medication order changes as part of their medication review process as well as the outcomes of their recommendations.

Design: Cross-sectional descriptive study of MOQI APRN-conducted medication reviews.

Setting: Long-stay nursing homes participating in the MOQI project.

Participants: Seventeen MOQI APRNs recorded medication reviews for 3314 long-stay residents residing in 16 Midwestern nursing homes over a 2-year period.

Intervention: APRNs conducted medication reviews and made recommendations for medication order changes to residents' medical providers.

Measurements: The MOQI medication review database was used to abstract data.

Results: There were 19,629 medication reviews recorded for 3314 residents during the 2-year period. Of the 19,629 reviews, 50% (n = 9841) resulted in recommended order changes of which 82% (n = 8037) of order changes occurred. More than two-thirds of recommendations were because of changes in the residents' plans of care. Other recommendations included adjusting and/or discontinuing medications that had the potential for harm.

Conclusion: Resident care needs are dynamic, resulting in the need for frequent medication order changes. MOQI APRNs, because of their advanced pharmacological education and daily presence in the nursing home, are uniquely positioned to ensure residents' medications aligned with their overall goals of care while minimizing risk of harm.

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Medications are a cornerstone of medical treatment in the United States. However, although medications are vital to manage symptoms, treat acute and chronic conditions, and prevent illness onset, they also can lead to adverse health outcomes. Older adults, because of their advanced age and multiple comorbidities, are vulnerable to adverse medication-related outcomes including delirium and falls¹ and acute

kidney injury.² Medication use in nursing home (NH) residents is especially concerning because of issues related to excessive, redundant, or inappropriate medications that pose a heightened risk of adverse outcomes such as unplanned hospitalizations.³

Medication reviews, most often done in NHs by pharmacists, can be effective in reducing inappropriate medications.^{4–6} However, pharmacists are not on site in NHs daily to influence medication use or monitor residents for adverse events. In most NHs, nurses, including both registered nurses (RNs) and licensed practical nurses (LPNs), are responsible for assessing residents' daily clinical needs, and communicating to physicians about those needs including needs related to their medications.⁷

Missouri Quality Initiative Project Overview

This study took place at the University of Missouri Sinclair School of Nursing, which partnered with 16 Midwestern NHs as part of a Centers

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* Address correspondence to Amy Vogelsmeier, PhD, RN, FAAN, S314 Sinclair School of Nursing, University of Missouri, Columbia, MO 65211.

E-mail address: vogelsmeiera@missouri.edu (A. Vogelsmeier).

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for Medicare and Medicaid (CMS)-funded demonstration project to reduce hospitalizations for long-stay residents. The Missouri Quality Initiative (MOQI), implemented between 2012 and 2016, embedded 17 full-time advanced practice registered nurses (APRNs) in 16 NHs to deliver care and facilitate improvement in NH care systems. The APRNs worked directly with residents, families, NH staff, and physician providers to prevent and manage illnesses to avoid the need for hospitalization.⁸

MOQI APRNs, who have advanced pharmacology as part of their graduate education to prepare them as prescribers, performed medication reviews during the project to reduce medication burden and ensure medication appropriateness to minimize risk for unplanned hospitalizations. Medication reviews were routinely completed on resident enrollment in MOQI, quarterly with each care plan review, and when triggered by events (ie, early illness onset, post-fall/behavior change, on return from the hospital, and/or initiation of hospice/palliative care) as well as focused reviews for high-risk drug types (eg, antipsychotics, antihypertensives, anticoagulants, diabetic agents, and diuretics). All medication reviews were done in relation to the residents' medical diagnoses, clinical parameters (eg, vital signs, weight, laboratory values, physical assessment findings) and the residents' individual goals for care.

As part of the medication review process, which included APRNs reviewing the residents' medical records and accessing hospital-based clinical records via an electronic portal established as part of the MOQI project,⁹ APRNs also collaborated with pharmacists, physicians, and nursing staff, and worked closely with residents and families. Because APRNs did not have prescriptive authority, as part of the MOQI project, they communicated their clinical findings and recommendations to the resident's medical provider and obtained order changes as needed to manage the resident's condition. The MOQI medical director, who is a geriatrician, long-term care medical director, and nursing home expert (CC), worked closely with the APRNs to facilitate their approach to medication reviews and to ensure standards of safe medication practices for NH residents were being followed. The purpose of this article was to describe the reasons MOQI APRNs recommended medication order changes as well as the outcomes of their recommendations.

Design/Methods

This was a cross-sectional descriptive study of APRN-recorded medication reviews for long-stay residents (living in the NH >100 days) in 16 Midwestern NHs between October 1, 2014, and September 30, 2016. NHs ranged in size from 120 to 321 beds with a total of 3160 beds in urban, metro, and rural communities. APRNs used an electronic database to document medication reviews by categories of action, as required by CMS for use in the initiative. Researchers downloaded key data elements for the medication reviews, noted in Table 1, into an Excel spreadsheet to calculate frequencies for analysis. Approval to conduct this study was obtained from the University of Missouri Health Sciences Institutional Review Board.

Findings/Results

Table 1 depicts results of the medication reviews. There were 19,629 medication reviews conducted for a total of 3314 long-stay NH residents during the 2-year period. The range of medication reviews per resident was 3.4 to 12.1. Of the 19,629 reviews, 50% (n = 9841) resulted in recommended medication order changes of which 82%, or 8037 order changes, were actually made.

More than two-thirds of medication order change recommendations were because of changes in the residents' plans of care, including (1) aligning with the resident's current goals of care and/or quality of life (n = 5537), (2) adjusting treatment for conditions no longer present (n = 1212), and (3) adjusting treatment because medications

Table 1
Advanced Practice Registered Nurses Medication Review Recommendations and Outcomes

| Centers for Medicare and Medicaid Services Required Database Elements | Total | Percentage |
|---|--------|------------|
| Medication reviews conducted | 19,629 | |
| Medication order change not recommended | 9788 | 49.8 |
| Medication order change recommended | 9841 | 50.1 |
| Recommendation not recorded | 334 | <1 |
| Primary reason for recommendations | | |
| Change in goals of care/Quality of life | 5337 | 56.1 |
| Condition no longer present or warrants treatment | 1212 | 12.8 |
| Gradual dose reduction attempt | 743 | 7.8 |
| Dosage/duration inappropriate | 515 | 5.42 |
| Medication ineffective | 333 | 3.5 |
| Potential inappropriate medication OR not recommended in population | 313 | 3.29 |
| Potential/actual adverse drug reaction | 296 | 3.11 |
| High-risk medication, monitoring required | 273 | 2.87 |
| Duplicative medication | 86 | <1.0 |
| Try alternative type of same class to obtain enhanced results | 78 | <1.0 |
| Insufficient diagnosis information | 45 | <1.0 |
| Unable to administer | 24 | <1.0 |
| Change from brand to generic | 19 | <1.0 |
| Reason for recommendation not recorded | 233 | 2.5 |
| Outcome of recommendation | | |
| Increase in dose and/or number of medications | 3535 | 37.2 |
| Decrease in dose and/or number of medications | 2845 | 29.9 |
| No change | 1470 | 15.4 |
| Decrease in medications AND increase in different medications | 987 | 10.4 |
| Laboratory/symptom-based medication monitoring | 367 | 3.9 |
| Change in frequency or administration time for existing medications | 303 | 3.2 |

were no longer effective (n = 333). Other recommendations related to adjusting and/or discontinuing medications that had the potential for harm included recommending gradual dose reductions (eg, antipsychotics) (n = 743), changing medications due to inappropriate dosage and/or duration (n = 515), and discontinuing medications because of inappropriate medication type for NH residents (n = 313). Potential adverse drug reactions, monitoring for high-risk medications, and duplicate medication orders accounted for 296, 273, and 86 recommended order changes, respectively. Other recommendations included requests for alternative medications (n = 78), requests to address insufficient documentation of diagnoses (n = 45), requests to change because medications were unable to be administered (eg, resident no longer able to take oral medications) (n = 24), and requested changes from brand to generic (n = 19).

Actual medication order changes received from the residents' medical providers resulted in adjustments in doses and/or numbers of medications including increases (n = 3535), decreases (n = 2,845), or a combination of increasing one medication and decreasing another medication (n = 987). There were 367 laboratory and symptom monitoring orders received and orders to change frequency or administration times occurred 303 times. Approximately 15% of the time, no order changes were received from the provider (n = 1470) as a result of APRN recommendations.

Discussion

This study identifies the number and extent of medication changes recommended by APRNs with advanced pharmaceutical knowledge. Many US NHs do not have daily access to APRNs, leading us to assume that this comprehensive management of medications simply cannot routinely occur. Currently, in most NHs, RNs and LPNs both make recommendations to physicians about medication order changes in relation to day-to-day resident care.⁷ However, LPNs are not as

effective at performing medication reviews because of their limited skills and abilities to assess resident needs,¹⁰ which may contribute to unsafe medication use.

Moreover, the number of APRN-recommended medication order changes described in this study occurred in addition to the federally mandated drug regimen reviews performed by pharmacists for which the medical record is the primary information source.¹¹ In this study, the volume of order changes occurring beyond pharmacists' recommendations likely reflect the dynamic nature of residents' medication needs. Pharmacist reviews, based primarily on the medical record, may be insufficient to recognize dynamic resident needs, and may underlie why medication review studies to date have not resulted in reduced hospitalizations or mortality.^{5,6} APRN-conducted reviews may be different because they work closely with residents, families, and staff on a daily basis,⁸ therefore, increasing the APRN's awareness of subtle changes that are key to recognizing adverse events early. Additionally, because APRNs work closely with residents and families during the care-planning process, perhaps they better understand the resident's goals of care, and, based on the APRN's advanced pharmacological education, could make appropriate recommendations for adjusting medications accordingly. Although it is unknown what direct effect APRN-conducted medication reviews may have had on the larger MOQI outcome of reduced hospitalizations,⁸ it is likely they played a role.

Conclusion

The frequency of medication order changes described in this study demonstrates that resident care needs are dynamic and require close monitoring. Because of their advanced education, APRNs are prepared to identify changes that can ensure appropriate medication management. Additionally, the APRNs day-to-day presence and relationship

with residents, families, and staff can ensure that medications align with the residents' overall goals of care while minimizing risk of harm.

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