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A Call to Address RN, Social Work, and Advanced Practice **Registered Nurses in Nursing** Homes

Solutions From the Missouri Quality Initiative

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ABSTRACT

Background: US nursing homes (NHs) have struggled to overcome a historic pandemic that laid bare limitations in the number and clinical expertise of NH staff.

Problem: For nurse staffing, current regulations require only one registered nurse (RN) on duty 8 consecutive hours per day, 7 days per week, and one RN on call when a licensed practical/vocational nurse is on duty. There is no requirement for a degreed or licensed social worker, and advanced practice registered nurses (APRNs) in NHs cannot bill for services.

Approach: It is time to establish regulation that mandates a 24-hour, 7-day-a-week, on-site RN presence at a minimum requirement of 1 hour per resident-day that is adjusted upward for greater resident acuity and complexity. Skilled social workers are needed to improve the quality of care, and barriers for APRN billing for services in NHs need to be removed.

Conclusions: Coupling enhanced RN and social work requirements with access to APRNs can support staff and residents in NHs.

Keywords: advanced practice registered nurse, nursing homes, registered nurse, regulations, social work

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TS nursing homes (NHs) are struggling to overcome a historic pandemic that laid bare limitations in both the number and clinical expertise of NH staff. NH residents are frail and complex; more than 60% of residents are wheelchair dependent and unable to walk without extensive assistance, nearly half of residents (46%) have a dementia diagnosis, and nearly 64% use a psychoactive medication.¹

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Yet, minimum federal requirements for NH staffing across professions have not changed in decades, nor have requirements kept up with the increasing complexity of resident care. Specifically, higher registered nurse (RN) staffing is associated with fewer pressure ulcers/injury, decreased infections, improved pain management, less dependence in activities of daily living, and decreased inappropriate antipsychotic use.²⁻⁸ Moreover, having a degreed social worker within the NH increases the odds of screening for resident depression, improves intervention for resident-to-resident aggression, and contributes to successful advance care planning.9-11 Although social work was not the sole focus, research has identified that fewer hours worked by nonnursing care support NH staff, which includes social work, are associated with poorer resident quality-of-life outcomes.¹²

Most NHs follow the minimum federal regulations for staffing.¹³ These regulations require 1 RN on duty 8 consecutive hours per day, 7 days per week, and 1 RN on call when a licensed practical nurse (LPN) is on duty.¹⁴⁻¹⁶ The national average for licensed nursing staff hours per resident is 1 hour 44 minutes per day (RN = 46)minutes; LPN/licensed vocational nurse [LVN] = 58 minutes).¹⁷ As noted by Kolanowski et al,¹³ the general public believes that NH staffing is adequate and that RNs play a significant role in the care of NH residents. Yet, 75% of NHs never meet the Centers for Medicare & Medicaid Services (CMS) requirement for minimum RN coverage.¹⁵ Furthermore, there is no CMS requirement for 24 hours a day and 7 days a week on-site RN coverage in NHs.18 Considering the complexity of today's NH resident, less than 1 hour of RN professional nursing care each day is woefully inadequate. Similarly, the majority (54%) of NH social service departments are largely staffed by 1 person.¹⁹

The lack of professional presence of RNs and social workers is further exacerbated by their perceived interchangeability, with little acknowledgment of the differences in their education and scope of practice. For the RN, interchangeability is with the LPN/LVN in direct care and administrative roles.²⁰⁻²² With the social worker, interchangeability is with the social worker, interchangeability is with the social work designee.²³ Federal regulations require that NHs with more than 120 beds employ 1 full-time "qualified social worker." Yet, a "qualified social worker" according to federal standards is not required to be a professionally trained or licensed social worker.¹⁹ NHs with fewer than 120 beds are not required to employ a social worker but do have to partner with an outside agency or individual person to provide needed psychosocial services. In a national survey, 28% of NH social service directors held a master's degree in social work (MSW) and 30% held a bachelor's degree in social work (BSW); just under half of the sample had no formal education in social work.¹⁹ Approximately three-fourths of MSWs held a state-issued license (eg, licensed master social worker [LMSW] or licensed clinical social worker [LCSW]).

The complexity of medical, psychosocial, and end-of-life needs among NH residents is exacerbated by a lack of professional nurses and social workers. Advanced practice registered nurses (APRNs) could be an integral part of NH staffing and contribute to elevating the skills of NH staff and managing complex resident care. Positive resident health outcomes achieved by NH APRNs have been well documented over the last 4 decades. Systematic reviews of NH APRN practice identified that APRNs were able to reduce avoidable hospitalizations and emergency department (ED) visits, reduce costs of care, improve resident quality of life, health, and functional status, and resident and family satisfaction.²⁴⁻²⁷ To change NH quality, APRNs need to be able to extend their reach beyond treatment-and work with NH leadership and staff to change the care systems that drive poor NH quality.²⁸

APRNs working in NHs offer clinical expertise and a deep understanding of nursing practice and quality improvement. Similarly, licensed social workers are equipped to manage the psychosocial needs of residents and family members as well as collaborating with NH teams to address policies and procedures to improve transitions of care (eg, between the NH and the hospital) and modify practices that contribute to racial disparities.^{29,30} By working with NH teams, including nursing leadership and staff nurses, APRNs can expand their reach. The purpose of this article is to summarize findings from the Missouri Quality Initiative (MOQI or Initiative) experience to suggest policy recommendations for the NH RN, social worker, and APRN.

MISSOURI QUALITY INITIATIVE

To address quality of care concerns and demonstrate the impact of advanced clinical skills, the MOQI was created with support from the CMS Initiative to Reduce Avoidable Hospitalizations. During phase 1 (2012-2016), the MOQI care model embedded full-time APRNs in 16 NHs in the St Louis area, with the goal of reducing hospitalizations and improving resident outcomes.³¹ The APRNs provided clinical expertise in the NHs as well as education focusing on improving the clinical skills of staff (RNs, LPNs, and certified nursing assistant [CNAs]) and modeled best practices through their actions. To improve recognition, assessment, and communication about changes in conditions, the MOQI model relied on the INTERACT (Interventions to Reduce Acute Care Transfers) tools,³² health information technology,^{33,34} and social work transitional care and improved endof-life care.^{23,35} Monthly feedback reports were prepared for the NHs to provide consistent information about key initiative outcomes and keep the nursing staff engaged.³¹ The APRNs were supported by an interdisciplinary team of experts in nursing, social work, health information, geriatric medicine, and quality improvement.²⁸

The final evaluation of phase 1 revealed that the MOQI intervention with APRNs achieved statistically significant reductions in all target outcomes. Specifically, there was a 27.4% reduction in all-cause hospitalizations (P < .001), 45.3% reduction in potentially avoidable hospitalization (P < .001), 32.1% reduction in all-cause ED visits (P < .001), and 43.9% reduction in potentially avoidable ED visits (P <.001). In addition, the MOQI intervention produced significant cost savings to Medicare of \$1153 (28.6%) per all-cause hospitalization, \$514 (40.2%) per potentially avoidable hospitalization, \$62 (36.3%) per all-cause ED visit, and \$21 (42.8%) per potentially avoidable ED visit.36

Building on the positive results of phase 1 of the *Initiative to Reduce Avoidable Hospitalizations*, CMS continued the clinical intervention in phase 2 (2016-2020) and introduced a new payment model to test the effect of that model on reducing avoidable hospitalizations and improving resident outcomes. The Payment Intervention was implemented in the original 16 MOQI NHs while continuing the clinical intervention (clinical + payment). A comparison group of 24 additional NHs was added to test payment-only. Participating NHs could receive payment for onsite treatment in the NH of 6 common conditions that lead to 80% of avoidable hospitalizations (urinary tract infection, pneumonia, congestive heart failure, skin infections, fluid/electrolyte disorder or dehydration, and chronic obstructive pulmonary disease/asthma). Eligibility and billing requirements were established by CMS.³⁷ A practitioner needed to confirm and document that the condition met specific clinical criteria for the NH to be eligible to bill for treating the condition on-site. A billing support team was created to educate and support the participating NHs (both the payment-only and clinical + payment groups) about the Payment Intervention.

The results of the MOQI program in phase 2 were mixed. The Payment Intervention did not produce any significant results in either the clinical + payment group or the payment-only group on the rate of avoidable hospitalizations, no affect (payment-only) or worse results (clinical + payment) in the utilization and expenditure measures, and a negative impact on Minimum Data Set (MDS) quality measures in both groups.³⁸ However, the reduction of avoidable hospitalizations achieved in the 16 NHs during phase 1 of the intervention was maintained, indicating the continuing positive impact of the full-time APRNs and support team (eg, health information technologies, social work, and geriatric medicine support).³⁹ While there were some positive clinical outcomes in the clinical + payment group, there were no significant positive results in either group resulting from the Payment Intervention.

There are many possible factors that may have contributed to these negative results, such as a 20% reduction in eligible participants due to managed care plan penetration, changes to the clinical criteria for billing, lack of NH physician engagement, and recoupment of Initiative funds from NHs.³⁸ Moreover, during the last 2 years of the Initiative, NH staffing worsened, and the COVID-19 pandemic resulted in extraordinary challenges to NHs.

WHAT WORKED IN MOQI

The APRNs were critical to the positive clinical outcomes in both phases 1 (clinical intervention) and 2 (clinical + payment). Throughout the Initiative, APRNs worked closely with RNs and other direct care staff to enhance their clinical skills and improve clinical reasoning and assessment with a focus on reducing potentially avoidable hospital transfers. In turn, staff became more skilled in their ability to identify changes in condition and improved their physical assessments and communication skills with the care team, including providers. In addition, APRNs emphasized the importance of basic care processes of hydration, nutrition, toileting, and mobility to maintain resident's health and wellbeing. Particularly in phase 2, staff, who were often LPNs, were encouraged to confer with their RN supervisor and contact the APRN if there was a resident health condition change. In turn, the APRN would collaborate with NH staff to discuss the change and identify next steps in management.

A key component of MOQI was improving care transitions through a focus on advance directives, goals of care, and end-of-life decisionmaking. This effort involved a licensed social worker working closely with APRNs, NH administrators, residents, and families. Improving care transitions occurred through the use of 4 targeted strategies: (1) education and training, (2) stakeholder and community engagement, (3) needs assessment and individualized coaching, and (4) quality improvement. The MOQI social worker trained and coached the NH social service providers, assisted with problem solving, and created capacity for sustained change through assisting with policy and procedure development and providing education and community connections.

Evidence-based resources were also provided to the NHs during MOQI including INTERACT tools, Hand-In-Hand training, resources for evidence-based quality improvement, and goals of care and end-of-life planning (Table). The support team worked closing with APRNs to build leadership and staff skills in health systems change. The APRN, in turn, became experts in facilitating NH capacity to implement the resources available through MOQI.⁴⁰

The APRN role was important to the NH response during the COVID-19 pandemic. At the onset of the pandemic, APRNs engaged with staff and leaders to interpret and apply everchanging state and federal pandemic guidance. Nearly all processes of care were impacted and NHs were not built for, nor were the organizations prepared to manage, large-scale outbreaks requiring complex isolation procedures, supply chain disruptions, and seriously ill residents and

Table. Some Resources Used by MOQI APRNs and Support Team	
Interventions to Reduce Avoidable Hospitalizations (INTERACT) https://pathway-interact.com/	A omprehensive set of tools and resources that promotes early illness recognition, communication regarding condition change and transfer, hospital transfer log review, advanced care planning, and quality improvement.
Hand-In-Hand training https://qsep.cms.gov/pubs/HandinHand. aspx	Training modules developed to assist staff to provide person-centered care for residents with dementia. The course can be used as a full course or in segments. APRNs were central in working with staff to identify and deliver content that was most appropriate to their setting.
Improved quality care	Examples include the following: (a) antipsychotic medication reduction included using evidence-based practice. The APRNs engaged with providers, pharmacy, and NH staff to identify residents appropriate for dosage reduction and nonpharmacological interventions; (b) identification and treatment of urinary tract infections following national guidelines.
Goals of care and end-of-life planning https://theconversationproject.org/ wp-content/uploads/2015/09/ TCP_StarterKit_Final.pdf https://www.ariadnelabs.org/serious- illness-care/ https://training.vitalsmarts.com/courses/ crucial-conversations-online-2018	Worked with facilities to develop a process for having goals of care discussions and ensuring that advance directives were available or if not available resident with capacity were offered the opportunity to complete a directive. Developed a system for completing advance directives during National Healthcare Decisions Day (Apr 16 annually). Crucial Conversations Training (APRN, leaders, RN, SWs)

Abbreviations: APRN, advanced practice registered nurse; NH, nursing home; RN, registered nurse; SW, social worker.

staff.⁴¹ During the pandemic, APRNs in MOQI evaluated ill residents, helped in the development of infection management processes, trained and monitored appropriate use of personal protective equipment, facilitated the use of guidelines, and helped leadership address resident and staff physical and mental health concerns.

Social workers also played a critical role in MOQI NHs throughout the COVID-19 pandemic. Social workers spent more time assisting residents with innovative communication strategies with family members when visitation was restricted (eg, setting up Zoom via tablets or telehealth) and speaking with family members about the health and well-being of residents when family was unable to visit. Social workers also worked with staff and residents to address worsening mental health including anxiety and depression as well as workplace stress. Although outside of their typical role, social workers assisted with meals and cleaning due to staff shortages, when needed.

CHANGING QUALITY OF CARE IN NURSING HOMES

There is critical need to improve the quality of care in NHs. The call to address NH quality is increasing in a way previously unheard of in the popular media.⁴² Experts in NH care quality have become increasingly concerned about the lack of 24-hour-a-day, 7-day-a-week RN presence.^{13,15} In addition, Rantz and colleagues⁴³ have joined other voices in pointing out the critical need for NH APRNs. Key advantages of APRNs working on-site in NHs are that not only can they evaluate and treat ill residents, but they also have the skills to coach staff in their understanding of clinical assessment, early illness identification, and management of ill residents. The breadth of APRNs' knowledge about medical management along with advanced nursing knowledge allows them to serve as an exceptional resource to staff, leaders, and providers, while assisting staff to develop their clinical reasoning skills.

Typically, APRNs who work in NHs are not hired by the facility because they cannot bill for services provided to manage the care of residents, thus making it difficult for NHs to afford to employ an APRN.⁴³ Currently, federal regulations will not allow for APRNs *to bill* Medicare for services provided to residents *if they are hired as employees of NHs*. This is not the case for physicians who may be hired as employees of NHs and also bill Medicare for services provided to residents.⁴³ NHs would benefit both clinically and financially from employing APRNs who can address resident needs as they arise and bill for those services even if employed by the NH.44 These highly educated nurse providers can positively influence NH quality through improved quality measures (which impacts star ratings); improved communication with residents/families regarding goals of care/end-of-life conversations; improved basic systems of care for hydration, nutrition, mobility, continence, and engagement with life; enhanced clinical skills for all direct care staff members; and early illness recognition and treatment of resident health conditions. In addition, reduced hospitalizations allow residents to remain in the NH and reduce revenue loss because of lost beddays.44

Similarly, calls for change in federal guidelines for what constitutes a social worker in NHs continue.¹⁹ Despite evidence that social service staff to resident ratios are too low and despite the dire need for professionally trained and licensed social workers within NHs, little change has occurred.45 With the implementation and regulation of licensed social workers in NHs, NHs would be equipped with staff knowledgeable and skilled in having difficult discussions, family mediation, and identification and treatment of mental health concerns. Licensed social workers are well situated to play critical and essential roles alongside APRNs and other members of the medical team to improve resident and systems of care.

WHAT NEEDS TO HAPPEN?

RNs and social workers working with APRNs in NHs offer a potentially powerful antidote to some of the persistent problems plaguing US NH quality. There is no question that to improve quality of resident care there *must* be RNs who are practicing in NHs, ready to evaluate and care for NH residents 24 hours per day, 7 days a week. There must be sufficient numbers of RNs working directly with residents so that they can receive the professional evaluation and care they need. This action requires fundamental regulatory change by CMS and subsequent enforcement of that basic RN standard in all NHs. It is time for these regulatory changes to occur. This includes establishing a regulation that mandates a 24-hour, 7-day-a-week on-site RN presence at a minimum requirement of 1 hour per resident-day that is adjusted upward for greater resident acuity and complexity.

To enhance NH care, it is also essential that federal guidelines recognize NH social service providers as degreed and licensed social workers and align definitions of qualified social workers with professional definitions of social work.¹⁹ Bern-Klug and colleagues⁴⁵ provide evidence that current social service staffing ratios create barriers for effective practice and an inability for residents' psychosocial needs to be adequately addressed. The capacity of social work practice that is possible within NHs is not well understood. Trained in managing conflict, diagnosing and managing systemic problems, negotiating goals of care, assessing and addressing social needs, diagnosing and treatment mental illness, and intervening to improve quality of life are among a few of the essential skills degreed and licensed social workers can provide. Given the increasing complexity of residents living in NHs, employing skilled social workers with an appropriately sized caseload has the potential to improve the quality and integration of care within NHs.

The barriers for APRN billing for services when hired by NHs need to be removed. Actions for barrier removal require changes in Medicare regulations enabled by Congress. These are minor but absolutely needed changes for NH residents to have unfettered access to APRN care. Finding a path forward to improving NH access to APRNs coupled with greater RN staffing and the presence of LCSWs is essential to making meaningful and lasting change in NH quality and safety.

REFERENCES

- Harrington C, Carillo H, Garfield R. Nursing facilities, staffing, residents, and facility deficiencies, 2009-2015. Published online July 2017:45. Accessed August 8, 2021. https: //files.kff.org/attachment/REPORT-Nursing-Facilities-Staffing-Residents-and-Facility-Deficiencies-2009-2015
- Abt Associates. Appropriateness of minimum nurse staffing ratios in nursing homes report to Congress: phase II final volume I contract # 500-0062/TO#3. Accessed September 1, 2021. https://theconsumervoice.org/uploads/files/issues/ CMS-Staffing-Study-Phase-II.pdf
- Bostick JE, Rantz MJ, Flesner MK, Riggs CJ. Systematic review of studies of staffing and quality in nursing homes. J Am Med Dir Assoc. 2006;7(6):366-376. doi:10.1016/j.jamda.2006.01.024
- Carter MW. Factors associated with ambulatory caresensitive hospitalizations among nursing home residents.

J Aging Health. 2003;15(2):295-331. doi:10.1177/08982 64303251892

- Carter MW, Porell FW. Vulnerable populations at risk of potentially avoidable hospitalizations: the case of nursing home residents with Alzheimer's disease. Am J Alzheimers Dis Other Demen. 2005;20(6):349-358.
- Dellefield ME, Castle NG, McGilton KS, Spilsbury K. The relationship between registered nurses and nursing home quality: an integrative review (2008-2014). *Nurs Econ.* 2015;33(2):95-108, 116.
- Harrington C, Schnelle JF, McGregor M, Simmons SF. The need for higher minimum staffing standards in U.S. nursing homes. *Health Serv Insights*. 2016;9:13-19. doi:10.4137/ HSi.S38994
- Konetzka RT, Stearns SC, Park J. The staffing-outcomes relationship in nursing homes. *Health Serv Res.* 2008;43(3): 1025-1042. doi:10.1111/j.1475-6773.2007.00803.x
- Bern-Klug M, Kramer KWO, Sharr P. Depression screening in nursing homes: involvement of social services departments. *Am J Geriatr Psychiatry*. 2010;18(3):266-275. doi:10.1097/JGP.0b013e3181c29431
- Bonifas RP. Resident-to-resident aggression in nursing homes: social worker involvement and collaboration with nursing colleagues. *Health Soc Work*. 2015;40(3):e101e109. doi:10.1093/hsw/hlv040
- Wang C, Chan CLW, Chow AYM. Social worker' involvement in advance care planning: a systematic narrative review. *BMC Palliat Care*. 2017;17(1):5. doi:10.1186/s12904-017-0218-8
- Harrington C, Zimmerman D, Karon SL, Robinson J, Beutel P. Nursing home staffing and its relationship to deficiencies. J Gerontol B Psychol Sci Soc Sci. 2000;55(5):S278-S287. doi:10.1093/geronb/55.5.s278
- Kolanowski A, Cortes TA, Mueller C, et al. A call to the CMS: mandate adequate professional nurse staffing in nursing homes. Am J Nurs. 2021;121(3):24-27. doi:10.1097/ 01.NAJ.0000737292.96068.18
- CMS. State operations manual appendix PP—guidance to surveyors for long term care facilities (Rev. 11-22-17). Accessed September 23, 2021. https://www.cms.gov/Medicare/ Provider-Enrollment-and-Certification/GuidanceforLaws AndRegulations/Nursing-Homes.html
- Harrington C, Dellefield ME, Halifax E, Fleming ML, Bakerjian D. Appropriate nurse staffing levels for U.S. nursing homes. *Health Serv Insights*. 2020;13:11786329 20934785. doi:10.1177/1178632920934785.
- Missouri. Rules of Department of Health and Senior Services Division Stat §§19 CSR 30-85.042 (2020) (enacted).
- CMS Nursing Home Compare. Accessed August 26, 2021. https://www.medicare.gov/care-compare/?providerType= NursingHome&redirect=true
- Geng F, Stevenson DG, Grabowski DC. Daily nursing home staffing levels highly variable, often below CMS expectations. *Health Aff (Millwood)*. 2019;38(7):1095-1100. doi:10.1377/hlthaff.2018.05322
- Bern-Klug M, Smith KM, Roberts AR, et al. About a third of nursing home social service directors have earned a social work degree and license. *J Gerontol Soc Work*. 2021;64(7): 699-720. doi:10.1080/01634372.2021.1891594
- Mueller C, Duan Y, Vogelsmeier A, Anderson RA, McConnell E, Corazzini K. Interchangeability of licensed nurses in nursing homes: perspectives of directors of nursing. *Nurs Outlook*. 2018;66(6):560-569. doi:10.1016/j. outlook.2018.09.004
- Vogelsmeier A. Identifying medication order discrepancies during medication reconciliation: perceptions of nursing home leaders and staff. J Nurs Manag. 2014;22(3):362-372. doi:10.1111/jonm.12165
- 22. Vogelsmeier A, Anderson RA, Anbari A, Ganong L, Farag A, Niemeyer M. A qualitative study describing

nursing home nurses sensemaking to detect medication order discrepancies. *BMC Health Serv Res.* 2017;17(1):531. doi:10.1186/s12913-017-2495-6

- Galambos C, Starr J, Rantz M, Petroski G. Analysis of advance directive documentation to support palliative care activity in nursing homes. *Health Soc Work*. 2016;41(4): 228-234. doi:10.1093/hsw/hlw042
- Bakerjian D. Care of nursing home residents by advanced practice nurses: a review of the literature. *Res Gerontol Nurs.* 2008;1(3):177-185. doi:10.3928/19404921-200 80701-04
- Donald F, Martin-Misener R, Carter N, et al. A systematic review of the effectiveness of advanced practice nurses in long-term care. J Adv Nurs. 2013;69(10):2148-2161. doi:10.1111/jan.12140
- Morilla-Herrera JC, Garcia-Mayor S, Martín-Santos FJ, et al. A systematic review of the effectiveness and roles of advanced practice nursing in older people. *Int J Nurs Stud.* 2016;53:290-307. doi:10.1016/j.ijnurstu.2015.10. 010
- Mileski M, Pannu U, Payne B, Sterling E, McClay R. The impact of nurse practitioners on hospitalizations and discharges from long-term nursing facilities: a systematic review. *Healthcare (Basel)*. 2020;8(2):114. doi:10.3390/ healthcare8020114
- Vogelsmeier A, Popejoy L, Kist S, et al. Reducing avoidable hospitalizations for nursing home residents: role of the Missouri Quality Initiative Intervention Support Team. J Nurs Care Qual. 2020;35(1):1-5. doi:10.1097/NCQ.00000000 0000444
- Miller VJ, Hamler T, Beltran SJ, Burns J. Nursing home social services: a systematic review of the literature from 2010 to 2020. Soc Work Health Care. 2021;60(4):387-409. doi:10.1080/00981389.2021.1908482
- Sloane PD, Yearby R, Konetzka RT, Li Y, Espinoza R, Zimmerman S. Addressing systemic racism in nursing homes: a time for action. J Am Med Dir Assoc. 2021;22: 886-892. doi:10.1016/j.jamda.2021.02.023
- 31. Rantz M, Alexander G, Galambos C, et al. Initiative to test a multidisciplinary model with advanced practice nurses to reduce avoidable hospitalizations among nursing facility residents. J Nurs Care Qual. 2014;29(1):1-8. doi:10.1097/NCQ.00000000000033
- Popejoy LL, Vogelsmeier AA, Alexander GL, et al. Analyzing hospital transfers using INTERACT acute care transfer tools: lessons from MOQI. J Am Geriatr Soc. 2019;67(9): 1953-1959. doi:10.1111/jgs.15996
- Alexander G, Popejoy L, Lyons V, et al. Exploring health information exchange implementation using qualitative assessments of nursing home leaders. *Perspect Health Inf Manag.* 2016;13(fall):1f.
- 34. Alexander GL, Rantz M, Galambos C, et al. Preparing nursing homes for the future of health information exchange.

Appl Clin Inform. 2015;6(2):248-266. doi:10.4338/ACI-2014-12-RA-0113

- 35. Galambos C, Rantz M, Popejoy L, et al. Advance directives in the nursing home setting: an initiative to increase completion and reduce potentially avoidable hospitalizations. J Soc Work End Life Palliat Care. 2021;17(1):19-34. doi:10.1080/15524256.2020.1863895
- 36. Ingber MJ, Feng Z, Khatutsky G, et al. Evaluation of the initiative to reduce avoidable hospitalizations among nursing facility residents: final report. Accessed September 24, 2021. https://www.cms.gov/Medicare-Medicaid-Coordination/Medicare-and-Medicaid-Coordination/Medicare-Medicaid-Coordination-Office/Downloads/NFPAHFinal Report092017.pdf
- 37. CMS. Phase two: payment reform. Accessed September 24, 2021. https://www.cms.gov/Medicare-Medicaid-Coordination/Medicare-and-Medicaid-Coordination/ Medicare-Medicaid-Coordination-Office/InitiativetoRed uceAvoidableHospitalizations/PhaseTwoPaymentReform
- RTI. Evaluation of the initiative to reduce avoidable hospitalizations among nursing facility residents—payment reform fourth annual report. Accessed September 22, 2021. https://innovation.cms.gov/data-and-reports/2021/pah2nfi2-ar4-main-report
- Vogelsmeier A, Popejoy L, Canada K, et al. Results of the Missouri Quality Initiative: six-year trends of reducing unnecessary hospitalizations. *J Nutr Health Aging*. 2021;25(1): 5-12. doi:10.1007/s12603-020-1552-8
- Rantz MJ, Popejoy L, Vogelsmeier A, et al. Reducing avoidable hospitalizations and improving quality in nursing homes with APRNs and interdisciplinary support: lessons learned. J Nurs Care Qual. 2018;33(1):5-9. doi:10.1097/ NCQ.0000000000000302
- Popejoy L, Vogelsmeier A, Boren W, et al. A coordinated response to the COVID-19 pandemic in Missouri nursing homes. J Nurs Care Qual. 2020;35(4):287-292. doi:10.1097/NCQ.000000000000504
- 42. Maggots, rape and yet five stars: how US ratings of nursing homes misled the public. *The New York Times*. Accessed September 24, 2021. https://www.nytimes.com/2021/03/13/ business/nursing-homes-ratings-medicare-covid.html
- Rantz MJ, Birtley NM, Flesner M, Crecelius C, Murray C. Call to action: APRNs in US nursing homes to improve care and reduce costs. *Nurs Outlook*. 2017;65(6):689-696. doi:10.1016/j.outlook.2017.08.011
- Rantz M, Vogelsmeier A, Popejoy L, et al. Financial and work-flow benefits of reducing avoidable hospitalizations of nursing home residents. J Nutr Health Aging. 2021;25(8): 971-978. doi:10.1007/s12603-021-1650-2
- 45. Bern-Klug M, Carter KA, Wang Y. More evidence that federal regulations perpetuate unrealistic nursing home social services staffing ratios. J Gerontol Soc Work. 2021;64(7): 811-831. doi:10.1080/01634372.2021