



Call to action: APRNs in U.S. nursing homes to improve care and reduce costs

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ABSTRACT

Background: Centers for Medicare and Medicaid Innovation Center sponsored the initiative to reduce avoidable hospitalizations among nursing facility residents.

Purpose: Missouri Quality Initiative (MOQI) designed inter-professional model in nursing homes with advanced practice registered nurses (APRNs).

Method: MOQI APRN model was implemented for 4 years in 16 nursing homes in a metro area of the Midwest. Hospitalizations were reduced (40% all-cause, 58% potentially avoidable), emergency room visits (54% all-cause, 65% potentially avoidable), Medicare expenditures for hospitalizations (34% all-cause, 45% potentially avoidable), and Medicare expenditures for emergency room visits (50% all-cause, 60% potentially avoidable) for long-stay nursing home residents.

Discussion: Success of the MOQI model reinforces decades of research demonstrating that care provided by APRNs is cost-effective, safe, and associated with positive health outcomes and patient satisfaction.

Conclusion: Nursing homes can implement and benefit by hiring APRNs. However, changes in the Code of Federal Regulation (CFR 483.40) are necessary to improve patient access to care and encourage hiring APRNs in US nursing homes.

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In the United States, Medicare spends more than \$14 billion annually on hospitalizations of nursing home residents; many of these hospitalizations are preventable and unnecessary (OIG, 2013). As a result, reducing unnecessary hospital admissions has become a priority (Vogelsmeier et al., 2015). On March 15, 2012, the U.S. Department of Health and Human Services Centers (USDHHS) for Medicare and Medicaid Services (CMS) released a funding opportunity, *Initiative to reduce avoidable hospitalizations among nursing facility residents*. Faculty of the University of Missouri successfully applied for and Missouri became one of seven

sites across the nation to test an evidence-based intervention for long-stay Medicare–Medicaid enrollees to reduce avoidable hospital admissions and readmissions, improve health outcomes, improve transition of residents between hospitals and nursing facilities (NFs), and reduce healthcare costs while preserving access to care (USDHHS, CMS, 2015; Rantz et al., 2015; Vogelsmeier et al., 2015).

The Missouri Quality Initiative (MOQI) implemented an interprofessional model in 16 NFs in Missouri, a region where readmission rates were significantly high, with advanced practice registered nurses (APRNs) (i.e.,

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nurse practitioners or clinical nurse specialists) providing direct care and early intervention to residents; mentoring, role-modeling for, and educating nursing staff; and participating in quality improvement activities (USDHHS, CMS, 2015; University of Missouri–Columbia, 2016; Popejoy et al., 2017; RTI, 2016; Rantz et al., 2014, 2015; Vogelsmeier et al., 2015). To support the APRNs assigned full-time to each facility, MOQI provides an MOQI interprofessional intervention team skilled in geriatric care that includes a Project Medical Director, a social services Care Transition Coach, a technology Health Information Coordinator, and a registered nurse (Quality Improvement Program for Missouri Nursing Homes [QIPMO]/INTERACT coach) modeled after the QIPMO (Galambos, Starr, Rantz, & Petroski, 2016; Rantz et al., 2014; Vogelsmeier et al., 2015).

The MOQI team collaborates with NF staff and administration to implement preventive services and improve early recognition and management of medical conditions commonly resulting in avoidable hospitalizations. They cooperate with facility providers, nursing staff, and resident families to improve quality of care through quality improvement activities involving causes of avoidable hospitalizations; facilitate smooth transition of residents between hospital, NF, and the community via accurate and timely health information exchange; expedite improved communication among providers of the hospitals and NFs; help facility staff and residents determine goals of care and make end of life informed decisions; and monitor prescription drugs to reduce polypharmacy and use of inappropriate psychotropic drugs (Alexander et al., 2015; Galambos et al., 2016; Hampton, Reiter, Doerr, & Popejoy, 2014; Rantz et al., 2014, 2015; Vogelsmeier et al., 2015).

Within the first 3 years of implementation, 2012 to 2015, MOQI has been associated with a statistically significant reduction in all key outcomes of the demonstration, measured as differences between MOQI facilities' group and a comparison group after controlling for baseline differences (RTI, 2017). In 2015, reductions were found in all-cause hospitalizations by -0.175 per resident, $p < .001$, a 40.0% reduction; in avoidable hospitalizations by -0.093 per resident $p < .001$, a 57.7% reduction; in all-cause emergency room visits by -0.161 per resident $p < .001$, a 54.1% reduction; and in avoidable emergency room visits by -0.056 per resident $p < .001$, a 65.3% reduction. Also, reduction in Medicare expenditures in all categories were statistically significant as measured in differences with the comparison group (RTI, 2017). MOQI was associated with a statistically significant reduction in total Medicare expenditures by $-\$2,066$ per resident $p = .034$, a 10.4% reduction; in spending on all-cause hospitalizations by $-\$1,369$ per resident, $p < .001$, a 33.6% reduction; in avoidable hospitalizations by $-\$577$ per resident, $p < .001$ a 45.2% reduction; in all-cause emergency room visits by $-\$86$ per resident, $p < .001$, a 50.2% reduction; and potentially avoidable emergency room visits by $-\$29$ per resident, $p < .001$, a 59.7% reduction.

According to Ingber et al. (2017), the MOQI intervention was associated with "consistent and significant" reductions in outcome measures, as reductions were larger in 2015 than in 2014. These data support the substantial impact of MOQI and the value of adding a full-time APRN to the facilities involved.

With this new evidence, it is imperative that there be a national action in the United States to encourage the hiring of APRNs and providing interprofessional skilled geriatric support to APRNs who choose to work in nursing homes. With nation-wide dissemination of the MOQI model, it is possible to have major health care cost savings while improving quality of direct care to our nation's elders in need of nursing home care. The purpose of this call to action is to describe additional evidence of quality of care offered by APRNs; discuss APRN roles in long-term care (LTC); review legal and budgetary considerations, including reimbursement opportunities for direct care provided by the APRN, which can offset salary and benefit expenses; and a call to action for changes in specific federal regulations which are needed to sustain and encourage the use of APRNs in nursing homes nationwide. These changes are essential to nationwide dissemination of the MOQI model, enabling wide-spread employment of APRNs in U.S. nursing homes.

APRN Quality of Care

Researchers have investigated the quality of care provided by APRNs since the 1970s. Although much of the research is dated, the span of publications reinforces how APRNs have consistently provided safe and effective care over the past 40 years in the United States. Most of the research demonstrates that care provided by physicians and nurse practitioners result in similar favorable health outcomes (Horrocks, Anderson, & Salisbury, 2002; Laurant et al., 2005; Lentz, Munding, Kane, Hopkins, & Lin, 2004; Newhouse et al., 2011; Sackett et al., 1974; Swan, Furguson, Chang, Larson, & Smaldone, 2015). In addition, physician and APRN prescribing practices are comparable (Horrocks et al., 2002; Venning, Durie, Roland, Roberts, & Leese, 2000), as are referrals to emergency departments and hospitalizations (Newhouse et al., 2011). Moreover, APRNs, compared with their physician counterparts, often demonstrate better patient satisfaction (Laurant et al., 2005; Lentz et al., 2004; Swan et al., 2015; Venning et al., 2000). Although APRN consultations were found to be longer and more frequent than that of physicians, Venning et al. (2000) and Swan et al. (2015) reported that health service costs were alike, and Aigner, Drew, and Phipps (2004) found that care by APRNs working with physicians may result in cost and time savings for physicians.

The APRN role is further supported by Oliver, Pennington, Revelle, and Rantz (2014) who documented the impact of nurse practitioners on Medicare

and Medicaid patients' health outcomes. They also found that states that fostered independent APRN practice compared with those that had limited or restricted APRN practice had lower rates of hospitalization, means (with standard deviation in parentheses) = 100.18 (22.9) vs. 145.85 (33.0), $p < .0001$, and improved health outcomes, $M = 16.82$ (10.96) vs. 29.9 (14.3), $p < .0001$, in Medicare and Medicaid patients. Thus, APRNs not only offer safe and effective care similar to that of physicians, but as APRN practice barriers are removed in the United States, hospitalization rates/costs and overall aggregate patient outcomes may further improve (Oliver et al., 2014).

APRNs in Long-Term Care in the United States

Studies on APRN practice in LTC facilities concur with those discussed above indicating that APRNs maintain physician, resident, and family satisfaction (Rosenfeld, Kobayashi, Barber, & Mezey, 2004), contribute to the reduction in hospitalization and emergency room visits (Burl, Bonner, & Rao, 1994; Burl, Bonner, Rao, & Khan, 1998), and are associated with positive health outcomes of facility residents (Burl et al., 1998; Ryan, 1999). The results of the first 3 years of the MOQI intervention reaffirms these findings. Clearly, the research supports the use of APRNs in not only primary care but also LTC.

The role of the LTC APRN as described by Rosenfeld et al. (2004) continues to be true in the state of Missouri today. LTC APRNs may be employed by physicians, by managed care organizations, by the LTC facilities, or may be independent providers collaborating with physicians. APRNs can impact the quality of care in each of these employment situations. Whereas APRNs employed or working in collaboration with physicians focus primarily on direct care (primary care) and APRNs employed by managed care organizations focus on cost containment, APRNs employed by LTC facilities have a greater diversity of practice responsibilities including direct patient care and cost containment (Rosenfeld et al., 2004). LTC-employed APRNs conduct in-service education; attend interdisciplinary team meetings; perform bedside rounds with physicians and nursing staff; provide wound care, preventative care, and hospice care; and evaluate and treat sick residents (Rosenfeld et al., 2004). LTC-employed APRNs also participate in facility quality improvement activities (University of Missouri-Columbia, 2016). Although APRNs can only bill for services provided directly to the resident, the other responsibilities conducted by the LTC-employed APRN can reduce staff burden, including facility educators, quality improvement designees, supervisors, and nurses. In addition, these APRNs are in a unique position to impact facility quality measures, reduce hospitalizations and

emergency room visits, and contain cost (Hampton et al., 2014; Rantz et al., 2014; RTI, 2017).

Legal and Budgetary Considerations in Employing APRNs

The literature clearly reinforces the safe and effective care provided by APRNs across the continuum of care in the United States. Given the impact of the MOQI model on improving patient outcomes and reducing unnecessary hospitalizations and healthcare costs, LTC facilities are in a unique position to sustain this program by hiring APRNs. The following information provides the LTC facility with the tools necessary to employ an APRN. Understanding salary and reimbursement considerations, collaborative practice requirements, employment contracts, and credentialing and billing are key to maximizing the APRNs value and expertise in the LTC field.

APRN Salary and Reimbursement

Although APRN salaries vary by specialty, practice setting, and location, Missouri is used as an example because it is the state in which the MOQI model is implemented. As of February 2016, the average annual Nurse Practitioner salary in Missouri was \$93,000 (U.S. Department of Labor, Bureau of Labor Statistics, 2016), with APRNs' specializing in geriatrics averaging \$91,000 per year (Indeed, 2017). APRNs employed by nursing homes and residential care facilities average \$79,400 per year (Nurse Journal, 2017). Some APRN services are reimbursable under Medicare and Medicaid; specifically face to face, medically necessary patient interactions are billable (Baker, 2010; USDHHS, CMS, 2012). These billable services can off-set the salary of APRNs employed by long-term care facilities.

In order to bill Medicare and Medicaid for evaluation and management (E&M) current procedural terminology (CPT) codes, APRNs must meet the scope of practice and physician collaboration and supervision requirements for the state in which the APRN is practicing (Baker, 2010; USDHHS, CMS, 2012). In the state of Missouri, APRNs are required by law to collaborate with a physician in order to perform designated physician acts such as prescribing and ordering diagnostic laboratory tests (Missouri General Assembly, Revisor of Statutes, 2015; Missouri Secretary of State [MSS], State Board of Nursing [SBN], 2015; MSS, State Board of Registration for the Healing Arts [SBHA], 2010) and therefore must be in a collaborative practice arrangement in order to bill for their services (Baker, 2010; USDHHS, CMS, 2012). Additionally, APRNs must have their own National Provider Identifier number, which requires that the APRN have at least a master's degree, be nationally certified, and recognized by their state as an APRN. APRNs are reimbursed at 85% of the physician rate (USDHHS, CMS, 2015c) for medically necessary visits. Table 1 delineates the most common CPT codes used by APRNs providing services in NFs and

assisted living facilities along with the current physician and APRN reimbursement rates for these CPT codes in the St Louis Metropolitan area (USDHHS, CMS, 2015d), the area of the MOQI Initiative.

Medical necessity and complexity, not the volume and quality of documentation, are the key criteria for billing (Baker, 2010). A face-to-face evaluation is required, but coding may also be dictated by time spent reviewing the medical record, discussing the case with staff, evaluating a resident, discussing care plans with a resident and family members, and documentation; one cannot bill for telephone calls or meetings in which the resident is not present (Baker, 2010). Only one E&M visit per resident per day is reimbursable; a physician and APRN cannot both bill for the same E&M visit on the same day (Baker, 2010).

Although it varies by the mix of CPT codes used, APRNs must see approximately 10 to 12 patients per day to meet their salaries and benefits and 14 to 15 patients per day to generate practice revenue, averaging a continuous case load of about 275 patients who are long-stay nursing home residents (Rosenfeld et al., 2004). Alternatively, if the APRN sees only skilled nursing facility (SNF) short-stay residents (often seen twice a week on average), then only an average caseload of 35 residents is necessary to generate revenue to cover salary and benefits. Although this caseload may not be realistic for APRNs employed by one LTC facility, the

APRN can fulfill additional nonrevenue producing responsibilities that indirectly affect the revenue base of the facility. If one APRN serves two or more facilities, the proposed caseload becomes more realistic but limits the APRN's ability to conduct other job responsibilities such as quality improvement and staff education.

APRN Billing

When discussing billing considerations in the United States, it is important to define the difference between a patient residing in an SNF bed (typically referred to as short-stay resident) vs. an NF bed (typically referred to as a long-stay resident). A resident is occupying an SNF bed when he/she is receiving Medicare A benefits; a resident is occupying an NF bed when he/she is not receiving Medicare A benefits (Baker, 2010; USDHHS, CMS, 2012). The Code of Federal Regulations (CFRs) Title 42 §483.40 dictates physician and nonphysician provider (including APRN) visits in SNFs and NFs (USGPO, 2011). As other states have done, Missouri adopted the federal rules and has no state rules regarding physician and nonphysician practitioners' SNF or NF visits (University of Minnesota, 2012).

Under CFR §483.40(c) (1), it is federally mandated that all nursing home residents be seen initially by a physician within 30 days of their admission to an SNF, then every 30 days for the first 90 days, then minimally

Table 1 – Physician and APRN Reimbursement by CPT Codes for Single MAC Locality in Missouri (2017)

CPT Code	Service Description	Physician Rate	APRN Rate (85% of Physician)
NF*			
99304	NF initial visit	\$91.14	\$77.46
99305	NF initial visit	\$129.65	\$110.25
99306	NF initial visit	\$165.43	\$140.62
99307	NF subsequent visit	\$44.43	\$37.77
99308	NF subsequent visit	\$68.75	\$58.44
99309	NF subsequent visit	\$90.62	\$77.03
99310	NF subsequent visit	\$134.80	\$114.58
99315	NF discharge (<30 minutes)	\$72.70	\$61.79
99316	NF discharge (>30 minutes)	\$105.28	\$89.49
99318	Annual NF assessment	\$95.35	\$81.05
Assisted living facility			
99324	New patient	\$55.14	\$46.87
99325	New patient	\$80.32	\$68.27
99326	New patient	\$138.70	\$117.90
99327	New patient	\$184.96	\$157.22
99328	New patient	\$216.16	\$183.74
99334	Established patient	\$60.03	\$51.03
99335	Established patient	\$94.68	\$80.48
99336	Established patient	\$133.96	\$113.87
99337	Established patient	\$192.04	\$163.23

USDHHS, CMS (2015d).

Note. APRN, advanced practice registered nurse; CPT, current procedural terminology; MAC, Medicare Administrative Contractor; NF, nursing facility.

Reimbursement rates include the 20% patient copay. As CPT codes increase, so does complexity of the visit. These CPT codes require specific documentation of medical necessity and complexity of decision making as designated by Centers for Medicare and Medicaid. Reimbursement rates are subject to change. Please refer to <https://www.cms.gov/> to access documentation requirements. Medicare physician fee schedule can be accessed at <https://www.cms.gov/Medicare/Medicare-Fee-for-Service-Payment/PFSlookup/index.html>.

* NF refers to both SNFs and NFs.

every 60 days thereafter (USDHHS, CMS, 2016b; USGPO, 2011). These federally mandated visits are also known as “required” visits (USDHHS, CMS, 2016b). Per CFR §483.40(c) (4), after the initial SNF visit, a physician may delegate other required visits to an APRN as long as the physician sees the resident every other visit (E, USGPO, 2011). In contrast, per CFR §483.40(f), in an NF, a physician may delegate to an APRN *who is not employed by the facility* any required visit, including the initial visit (USGPO, 2011). It is important to note that APRNs in SNFs may complete other medically necessary visits prior to or after the physician’s initial comprehensive evaluation (Baker, 2010; USDHHS, CMS, 2016b).

Billing Restrictions for APRNs

At the same time, federal regulations in the United States dictate specific billing restrictions for APRNs who are employed by LTC facilities. The distinction between an SNF resident and an NF resident is also very important with regard to the billing practices of an APRN employed by the facility. Table 2 identifies which SNF and NF visits and associated orders are allowable by federal regulation for APRNs employed and not employed by LTC facilities. Whereas the regulations allow APRNs not employed by the LTC facility to conduct the NF initial comprehensive visit, write admission orders and treatments, and certify/recertify SNF admissions, the regulations do not permit LTC-employed APRNs to do so. This presents a potential delay in access to care and a barrier to the further success of the MOQI model (USDHHS, CMS, 2016b; USGPO, 2011). Allowing LTC-employed APRNs to conduct all visits which APRNs not employed by the LTC facility can conduct would increase timely access to care and allow physicians to focus where his/her training and expertise are most needed, on more medically complicated residents. The federal regulation making a distinction between facility employed APRNs and those employed in practices outside the facility is likely out of date, especially in the world of value-based medicine with managed care, bundles, and practitioner evaluation of cost and quality.

Call to Action: Revisions to U.S. Medicare Regulations

Many physicians who practice in LTC also have office and hospital practices. Although some physicians only practice in LTC facilities, they usually serve numerous facilities that are geographically dispersed. The same holds true for APRNs who practice in LTC facilities, whether employed by a physician or working as independent contractors. It is not financially feasible for physicians and APRNs to travel to a LTC facility to conduct required visits on a small number of residents. Additionally, as with many specialty areas, there is a shortage of physicians specializing in LTC (Institute of Medicine, 2008). The shortage of providers and the lack of financial incentive to travel to facilities on an as needed bases limits residents’ access to necessary care (Johnson, Stone, & Bell, 2007). Allowing APRNs, whether employed by the facility or not, to conduct the first visit as well as other required visits, and to write orders to admit and admission treatment orders can increase access to care in NFs. Revising *only four portions* of CFR §483.40 (USGPO, 2011) is necessary to allow LTC-employed APRNs, to conduct all visits in NFs and SNFs that APRNs not employed by the LTC facility can conduct. Recommended changes to CFR §483.40 are in italics as follows:

- CFR §483.40(c) (1) The resident must be seen by a *physician or a nurse practitioner or clinical nurse specialist, including those employed by the facility*, at least every 30 days for the first 90 days after admission and at least every 60 days thereafter.
- CFR §483.40(c) (3) *At the option of the physician, required visits, other than the initial comprehensive visit in the SNF, may be conducted by the physician or a nurse practitioner or clinical nurse specialist, including those employed by the facility.*
- CFR §483.40(c) (4) At the option of the physician, required visits in SNFs after the initial visit may alternate between personal visits by the physician and visits by a nurse practitioner or clinical nurse specialist *including those employed by the facility or physician assistant.*

Table 2 – Allowable APRN Visits and Orders for SNF Versus NF

Visits and Orders	APRN Not Employed by LTC Facility	LTC Employed APRN	APRN Not Employed by LTC Facility	LTC Employed APRN
	SNF		NF	
Order to admit	No	No	Yes	No*
Admission treatment orders	No	No	Yes	No*
Initial comprehensive visit	No	No	Yes	No*
Other required visits	Yes	Yes	Yes	No*
Other medically necessary visits	Yes	Yes	Yes	Yes
Other medically necessary orders	Yes	Yes	Yes	Yes
Certification/recertification	Yes	No*	Yes	Yes

Note. APRN, advanced practice registered nurse; LTC, long-term care; NF, nursing facility; SNF, skilled nursing facility. U.S. Government Publishing Office (USGPO) (2011). 42 CFR Part 483. Retrieved from <https://www.gpo.gov/fdsys/pkg/CFR-2011-title42-vol5/pdf/CFR-2011-title42-vol5-part483.pdf>

* Outlined regulatory changes in this article are intended to change these “NOs” to “YESs.”

- CFR §483.40(f) At the option of the State, any required physician task in an NF (including tasks which the regulations specify must be performed personally by a physician, *other than the initial comprehensive visit in the SNF*) may also be satisfied when performed by a nurse practitioner or clinical nurse specialist *including those employed by the facility* or physician assistant.

The recommended revision of CFR §483.40(c) (3) would enable APRNs in SNFs and NFs, whether employed by the facility or not, to conduct required (other than the initial comprehensive visit in the SNF), and other visits, such as first or change in condition (at the option of the physician), handle admissions, write admission orders, and write admission treatment orders. If APRNs employed by the LTC facility are present in the building on a full-time basis, treatment delays can be minimized; they should be able to directly observe residents promptly on admission and communicate with the physician, often within the first day of admission. Timely treatment implementation is crucial for cost-effective care, timely medication, and treatment reconciliation. The revisions of CFR §483.40(c) (3) and CFR §483.40(c) (4) permit LTC-employed APRNs to perform required visits in SNFs and NFs (30- or 60-day required visits) at the discretion of the physician. Finally, the revision of CFR §483.40(f) addresses required visits in NFs, also allowing the LTC-employed APRN, as is currently the case for LTC-employed physicians, to conduct required visits. Restricting visits by an LTC-employed APRN while allowing LTC-employed physicians is unnecessary regulation of an APRN's practice.

The goal of these recommended changes to CFR §483.40 is to authorize all APRNs, including those employed by the facility, the ability to conduct the same required visits within the SNF and NF as APRNs not employed by the facility, thus converting the "NOs" to "YESs" in [Table 2](#) that restrict LTC-employed APRN practice. Because LTC-employed APRNs are more readily available to assess the resident, changes in these five areas can improve access to care, expedite treatment interventions, and improve outcomes, thus reducing cost of care for long-stay nursing home residents. These changes can promote, encourage, and sustain the use of APRNs in nursing homes nationwide. In addition, these changes also offer physicians the flexibility to schedule his/her time to maximize productivity in the LTC facility.

CMS has existing safeguards in place to protect from exploitation or cost escalation that may potentially result from these revisions of CFR §483.40. The Federal False Claims Act, the Anti-Kickback Statute, and the Physician Self-Referral Law apply to all Medicare providers and are in place to prevent Medicare fraud ([USDHSS, CMS, 2016a](#)). In addition, CMS has the Recovery Audit Program in place to identify improper payments and collect on overpayments ([USDHSS, CMS, 2016c](#)). Once the changes in CFR §483.40 are in place, claims analysis and close monitoring of billing

practices of LTC facilities are recommended to ensure proper billing procedures are in place. With the advent of value-based medicine, cost escalation will be limited as it will only hurt the practitioner and the facility. Many commercial insurers now routinely employ APRNs to help manage both NF and SNF patients in a cost and quality controlled manner; some of these insurers use some the features that are similar to MOQI.

Because of the existing safeguards, the benefits of revising CFR §483.40, which increases resident access to care and expedites treatment interventions, far outweighs the risks of potential exploitation. It is expected that the prompt implementation of treatment interventions, especially in SNFs, will result in cost containment due to faster recovery and return to the community.

Conclusion

APRNs have a proven record of providing safe, therapeutic, and cost-effective care to their patients in the United States ([Aigner et al., 2004](#); [Horrocks et al., 2002](#); [Laurant et al., 2005](#); [Lentz et al., 2004](#); [Newhouse et al., 2011](#); [Oliver et al., 2014](#); [Sackett et al., 1974](#); [Swan et al., 2015](#); [Venning et al., 2000](#)). MOQI capitalizes on the expertise of APRNs by providing a full-time APRN in each of 16 NFs in Missouri in an effort to meet the goals of CMS' Initiative to Reduce Avoidable Hospitalizations among NF Residents ([USDHSS, CMS, 2015](#); [RTI, 2017](#); [Rantz et al., 2014, 2015](#); [Vogelsmeier et al., 2015](#)). In just 3 years, MOQI was associated with "consistent and significant" reductions in outcome measures for long-stay nursing home residents, as reductions were larger in 2015 than in 2014 ([Ingber et al., 2017](#)). These included reducing hospitalizations (40% all cause, 58% potentially avoidable), emergency room visits (54% all cause, 65% potentially avoidable), Medicare expenditures for hospitalizations (34% all cause, 45% potentially avoidable), and Medicare expenditures for emergency room visits (50% all cause, 60% potentially avoidable) ([RTI, 2017](#)).

Disseminating the MOQI model nationwide in the United States has much potential for major health care cost savings while improving quality of direct care to our nation's elders in need for nursing home care. However, to widely disseminate, sustain and encourage the use of APRNs in nursing homes, some changes in Medicare regulations are needed. These changes are essential to reap the benefits of APRNs working in nursing homes with residents and staff to improve care and maintain the health of the residents, avoiding unnecessary, avoidable, and debilitating hospitalizations. With these changes, NFs can employ APRNs to provide needed on-site services to support residents and education of staff to improve care. The recommended regulatory changes would enable billing for the APRNs' face-to-face patient interactions to cover a portion of their salaries. Revising CFR §483.40 to allow APRNs

employed by LTC facilities, as APRNs who are not employed by LTC facilities are allowed, to conduct necessary visits in NFs will expedite and improve resident's access to care, while enhancing physician productivity. With nationwide implementation of the MOQI model, enabled by these regulatory changes, people in the United States can benefit from services of APRNs, proven to improve nursing home care.

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REFERENCES

- Aigner, M. J., Drew, S., & Phipps, J. (2004). A comparative study of nursing home resident outcomes between care provided by nurse practitioners/physicians versus physicians only. *Journal of the American Medical Directors Association*, 5, 16–23.
- Alexander, G. L., Rantz, M., Galambos, C., Vogelsmeier, A., Flesner, M., Popejoy, L. L., ..., Elvin, M. (2015). Preparing nursing homes for the future of health information exchange. *Applied Clinical Informatics*, 6, 248–266.
- Baker, A. S. (2010). *Billing and coding in long term care: Basic billing and coding in long term care—Part 1. A Webinar series by the American Medical Directors' Association*. Handouts Retrieved from http://www.amda.com/cmehdirect/webinars/11-17-10_Handout.pdf
- Burl, J. B., Bonner, A., & Rao, M. (1994). Demonstration of the cost-effectiveness of a nurse practitioner/physician team in long-term care facilities. *HMO Practice*, 8(4), 157–161.
- Burl, J. B., Bonner, A., Rao, M., & Khan, A. M. (1998). Geriatric nurse practitioners in long-term care: Demonstration of effectiveness in managed care. *Journal of the American Geriatrics Society*, 46(4), 506–510.
- Galambos, C., Starr, J., Rantz, M., & Petroski, G. (2016). Analysis of advance directive documentation to support palliative care activity in nursing homes. *Health and Social Work*, 41(4), 228–234.
- Hampton, J. K., Reiter, T., Doerr, J., & Popejoy, L. (2014). Using FOCUS PDA to improve antipsychotic medication management. *Journal of Nursing Care Quality*, 29(4), 295–302.
- Horrocks, S., Anderson, E., & Salisbury, C. (2002). Systematic review of whether nurse practitioners working in primary care can provide equivalent care to doctors. *British Medical Journal*, 324(6), 819–823.
- Indeed. (2017). Nurse practitioner salary in Missouri. Retrieved from <http://www.indeed.com/salary/q-Nurse-Practitioner-l-Missouri.html>
- Ingber, M. J., Feng, Z., Khatutsky, G., Wang, J. M., Bercaw, L. E., Zheng, N. T., ..., Segelman, M. (2017). Initiative to reduce avoidable hospitalizations among nursing facility residents shows promising results. *Health Affairs*, 36(3), 441–450.
- Institute of Medicine. (2008). *Retooling America's health care workforce: Building the health care work force*. Retrieved from <https://www.nationalacademies.org/hmd/Reports/2008/Retooling-for-an-Aging-America-Building-the-Health-Care-Workforce.aspx>
- Johnson, C. J. G., Stone, D. L., & Bell, K. T. (2007). *Skilled nursing facility economic outcomes: A comparison of two non-physician practitioner service models*. Retrieved from http://www.shcmedicalpartners.com/wp-content/uploads/2012/03/IntegritasWhitePaper_SNFOutcomes_2007.pdf
- Nurse Journal. (2017). *Nurse practitioner salary by state*. Retrieved from <http://nursejournal.org/nurse-practitioner/nurse-practitioner-salary-statistics/>
- Laurant, M., Reeves, D., Hermens, R., Braspenning, J., Grol, R., & Sibbald, B. (2005). Substitution of doctors by nurses in primary care (review). *Cochrane Database of Systematic Reviews*, (2).
- Lentz, E. R., Munding, M. O., Kane, R. L., Hopkins, S. C., & Lin, W. X. (2004). Primary care outcomes in patients treated by nurse practitioners or physicians: Two-year follow up. *Medical Care Research and Review*, 61(3), 332–351.
- Missouri General Assembly. (2015). *Revisor of Statutes. Chapter 334 physicians and surgeons—Therapists—Athletic trainers—Health care providers, Section 334.104.1*. Retrieved from <http://revisor.mo.gov/main/OneSection.aspx?section=334.104&bid=17763&hl=>
- Missouri Secretary of State. (2015). *Code of State Regulations, Title 20 Department of Insurance, Financial Institutions, and Professional Registration, Division 2200—State Board of Nursing. Chapter 4—General Rules*. Retrieved from <http://www.sos.mo.gov/cmsimages/adrules/csr/current/20csr/20c2200-4.pdf>
- Missouri Secretary of State. (2010). *Code of State Regulations, Title 20 Department of Insurance, Financial Institutions, and Professional Registration, Division 2150—State Board of Registration for the Healing Arts. Chapter 5—General Rules*. Retrieved 3/1/17 from <http://www.sos.mo.gov/cmsimages/adrules/csr/current/20csr/20c2150-5.pdf>
- Newhouse, R. P., Stanik-Hutt, J., White, K. M., Johantgen, M., Bass, E. B., & Zangaro, G. (2011). Advanced practice nurse outcomes 1990–2008: A systematic review. *Nursing Economics*, 29(5), 1–22.
- Oliver, G. M., Pennington, L., Revelle, S., & Rantz, M. (2014). Impact of nurse practitioners on health outcomes of Medicare and Medicaid patients. *Nursing Outlook*, 62, 440–447.
- Popejoy, L. L., Vogelsmeier, A., Galambos, C., Flesner, M., Alexander, G., Lueckenotte, A., ..., Rantz, M. (2017). The APRN role in changing nursing home quality: The Missouri Quality Improvement Initiative. *Journal of Nursing Care Quality*, 32(3), 196–201, PAP 5/12/17.
- Rantz, M., Alexander, G., Galambos, C., Vogelsmeier, A., Popejoy, L., Flesner, M., ..., Zwygart-Stauffacher, M. (2014). Initiative to test a multidisciplinary model with advanced practice nurses to reduce avoidable hospitalizations among nursing facility residents. *Journal of Nursing Care Quality*, 29(1), 1–8.
- Rantz, M. J., Flesner, M. K., Franklin, J., Galambos, C., Pudlowski, J., Pritchett, A., ..., Lueckenotte, A. (2015). Better care, better quality: Reducing avoidable hospitalizations of nursing home residents. *Journal of Nursing Care Quality*, 30(4), 290–297.
- Research Triangle Institute (RTI) International. (2017). *Evaluation of the initiative to reduce avoidable hospitalizations among nursing*

- home facility residents: Annual Report, Project Year 4. Retrieved from <https://innovation.cms.gov/Files/reports/irahnfr-finalyrfourevalrpt.pdf>
- Research Triangle Institute (RTI) International. (2016). *Evaluation of the initiative to reduce avoidable hospitalizations among nursing home facility residents: Final Annual Report Project Year 3*. Retrieved from <https://innovation.cms.gov/Files/reports/irahnfr-finalyrthreeevalrpt.pdf>
- Rosenfeld, P., Kobayashi, M., Barber, P., & Mezey, M. (2004). Utilization of nurse practitioners in long-term care: Findings and implications of a national survey. *Journal of the American Medical Directors Association*, 5, 9–15.
- Ryan, J. W. (1999). Collaboration of the nurse practitioners and physician in long-term care. *Lippincott's Primary Care Practice*, 3(2), 127–134.
- Sackett, D. L., Spitzer, W. O., Gent, M., Roberts, R. S., Hay, W. I., Lefroy, G. M., ..., McAuley, R. G. (1974). The Burlington randomized trial of nurse practitioner: Health outcomes of patients. *Annals of Internal Medicine*, 80(2), 137–142.
- Swan, M., Furguson, S., Chang, A., Larson, E., & Smaldone, A. (2015). Quality of primary care by advanced practice nurses: A systematic review. *International Journal for Quality in Health Care*, 27(5), 396–404.
- U.S. Department of Health and Human Services, Centers for Medicare and Medicaid Services (USDHSS, CMS). (2016a). *Avoiding Medicare fraud and abuse: A roadmap for physicians*. Retrieved from https://www.cms.gov/Outreach-and-Education/Medicare-Learning-Network-MLN/MLNProducts/Downloads/Avoiding_Medicare_FandA_Physicians_FactSheet_905645.pdf
- U.S. Department of Health and Human Services, Centers for Medicare and Medicaid Services (USDHSS, CMS). (2016b). *Medicare Claims Processing Manual: Chapter 12 Physician/non-physician practitioners*. Retrieved from <https://www.cms.gov/Regulations-and-Guidance/Guidance/Manuals/downloads/clm104c12.pdf>
- U.S. Department of Health and Human Services, Centers for Medicare and Medicaid Services (USDHSS, CMS). (2016c). *Recovery Audit Program*. Retrieved from <https://www.cms.gov/Research-Statistics-Data-and-Systems/Monitoring-Programs/Medicare-FFS-Compliance-Programs/Recovery-Audit-Program/index.html>
- U.S. Department of Health and Human Services, Centers for Medicare and Medicaid Services (USDHSS, CMS). (2015). *Fact sheet: CMS initiative to reduce avoidable hospitalizations among nursing facility residents*. Retrieved from <https://innovation.cms.gov/initiatives/rahnfr/>
- U.S. Department of Health and Human Services, Centers for Medicare and Medicaid Services (USDHSS, CMS). (2015c). *Medicare Information for Advanced Practice Registered Nurses, Anesthesiologist Assistants, and Physician Assistants*. Retrieved from <https://www.cms.gov/site-search/search-results.html?q=APRN%20reimbursement>
- U.S. Department of Health and Human Services, Centers for Medicare and Medicaid Services (USDHSS, CMS). (2015d). *Physician Fee Schedule Lookup Tool*. Retrieved from <https://www.cms.gov/Medicare/Medicare-Fee-for-Service-Payment/PFSLookup/index.html>
- U.S. Department of Health and Human Services, Centers for Medicare and Medicaid Services (USDHSS, CMS). (2012). *Nursing Facility Services (Codes 99304-99318)*. Retrieved from <https://www.cms.gov/Outreach-and-Education/Medicare-Learning-Network-MLN/MLNMattersArticles/downloads/mm4246.pdf>
- U.S. Department of Health and Human Services, Office of Inspector General (USDHHS, OIG). (2013). *Medicare nursing home resident hospitalization rates merit additional monitoring*. Retrieved from <https://oig.hhs.gov/oei/reports/oei-06-11-00040.pdf>
- U.S. Department of Labor, Bureau of Labor Statistics. (2016). *Occupational employment statistics: May 2016 state occupational employment and wage estimates Missouri*. Retrieved from https://www.bls.gov/oes/current/oes_mo.htm#29-0000
- U.S. Government Publishing Office (USGPO). (2011). 42 CFR Part 483. Retrieved from <https://www.gpo.gov/fdsys/pkg/CFR-2011-title42-vol5/pdf/CFR-2011-title42-vol5-part483.pdf>
- University of Minnesota. (2012). *Nursing home regulations plus*. Retrieved from <http://www.hpm.umn.edu/nhregplus/NH%20Regs%20by%20Topic/Topic%20Physician%20Services.html>
- University of Missouri—Columbia, Sinclair School of Nursing. (2016). *Summary of the Missouri Quality Initiative for Nursing Homes (MOQI)—A 4-year demonstration, Sinclair School of Nursing, funded by the Centers for Medicaid and Medicare [sic] Services (CMS)*. Retrieved from <http://nursinghomehelp.org/moqi/MOQITalkPts.pdf>
- Venning, P., Durie, A., Roland, M., Roberts, C., & Leese, B. (2000). Randomized controlled trial comparing cost effectiveness of general practitioners and nurse practitioners in primary care. *British Medical Journal*, 320(15), 1048–1053.
- Vogelsmeier, A., Popejoy, L., Rantz, M., Flesner, M., Lueckenotte, A., & Alexander, G. (2015). Integrating advanced practice registered nurses into nursing homes: The Missouri Quality Initiative experience. *Journal of Nursing Care Quality*, 30(2), 93–98.