Effect of Age-Friendly Care on Days at Home Post-Hospital Discharge for Traditional Medicare Patients: A Cross-Sectional Study

INQUIRY: The Journal of Health Care Organization, Provision, and Financing Volume 62: 1–7 © The Author(s) 2025 Article reuse guidelines: sagepub.com/journals-permissions DOI: 10.1177/00469580251324408 journals.sagepub.com/home/inq



Kathleen Drago, MD¹, Bryanna De Lima, MPH¹, Sophie Rasmussen, MBA², Alaina Ena, RN, MN¹, Elizabeth Eckstrom, MD, MPH¹, and Ella Bowman, MD, PhD¹

Abstract

The Bundled Payment for Care Improvement Advanced (BPCI-A) model encourages value-based care by bundling 90-day healthcare-related costs into a single payment for eligible service codes and procedures for traditional Medicare Part A and B beneficiaries. Our institution, an Age-Friendly Health Systems Level 2 certified academic health center, participated in the BPCI-A model from 2018 to 2022. This study aimed to determine differences in days spent at home in the 30- and 90-day post-hospitalization period for older patients in the BPCI-A program based on Age-Friendly care status. Descriptive analyses assessed differences among patients who received Age-Friendly care (n=275) and those who did not (n=348). Zero-one-inflated beta regression models with propensity score matching compared the probability of spending days at home between groups. Sensitivity analyses were conducted. Age-Friendly care recipients tended to be older males with non-emergent admissions and lower risk-adjusted mortality scores (P < .05). No significant differences were shown between groups at 30- and 90-days post-discharge for the original analysis. Sensitivity analyses found the probability of spending all eligible days at a facility 30-days post discharge significantly higher for those not receiving Age-Friendly care compared to those receiving Age-Friendly care (P < .05). Admissions receiving at least 3Ms resulted in less days in a facility within 30 days of discharge. This highlights the importance of patient-centered and value-based care during the hospital stay. Future studies should continue to explore days at home as a patient-centered outcome measure and how comprehensive Age-Friendly care impacts days at home for a larger cohort.

Keywords

value-based care, age-friendly, older adults, Medicare Part A, episode of care

Introduction

Older adults account for the majority of hospital days in the United States and are at the greatest risk of hospital-related preventable harm.^{1,2} Avoidable conditions like delirium, falls, functional loss, and adverse reactions to high-risk medications can significantly affect hospital survival, ability to return to independence and long-term health.³⁻⁶ These conditions negatively affect patient outcomes, strain the inpatient admission and discharge process, and increase costs.⁷⁻⁹

Best practices to help older adults thrive during hospitalization and prevent complications are well established, yet inconsistently implemented and rarely sustained.^{10,11} Clinics, hospitals, post-acute & long-term care settings and health systems may not have access to geriatric medicine specialists with systems improvement expertise. The Institute for Healthcare Improvement and the John A. Hartford Foundation in concert with national experts developed Age-Friendly Health Systems, an improvement initiative designed for all settings to reliably deliver high value care to all older

¹Division of General Internal Medicine & Geriatrics,Oregon Health & Science University, Portland, OR, USA ²Department of Quality Management, Oregon Health & Science

University, Portland, OR, USA

Received 18 October 2024; revised 11 February 2025; revised manuscript accepted 11 February 2025

Corresponding Author:

Bryanna De Lima, Division of General Internal Medicine & Geriatrics, Oregon Health & Science University, 3181 SW Sam Jackson Park Rd, L475, Portland, OR 97239, USA. Email: delimab@ohsu.edu

Creative Commons Non Commercial CC BY-NC: This article is distributed under the terms of the Creative Commons Attribution-NonCommercial 4.0 License (https://creativecommons.org/licenses/by-nc/4.0/) which permits non-commercial use, reproduction and distribution of the work without further permission provided the original work is attributed as specified on the SAGE and Open Access pages (https://us.sagepub.com/en-us/nam/open-access-at-sage). Inpatient clinical episodes: MS-DRG codes

Clinical episode	DRG(s) 280, 281, 282		
Acute myocardial infarction			
Back & neck except spinal fusion	518, 519, 520		
Cardiac arrhythmia	308, 309, 310		
Cardiac valve	216, 217, 218, 219, 229, 221		
Cellulitis	602, 603		
Chronic obstructive pulmonary disease, bronchitis, asthma	190, 191, 192, 202, 203		
Congestive heart failure	291, 292, 293		
Coronary artery bypass graft	231, 232, 233, 234, 235, 236		
Endovascular Cardiac Valve Replacement	266, 267		
Hip & femur procedures except major joint	480, 481, 482		
Lower extremity and humerus procedure except hip, foot, femur	492, 493, 494		
Major joint replacement of the lower extremity	469, 470		
Major joint replacement of the upper extremity	483		
Pacemaker	242, 243, 244		
Percutaneous coronary intervention	246, 247, 248, 249, 250, 251		
Renal failure	682, 683, 684		
Sepsis	870, 871, 872		
Simple pneumonia and respiratory infections	177, 178, 179, 193, 194, 195		
Spinal fusion	471, 472, 473, 453, 454, 455, 458, 460		
Urinary tract infection	689, 690		

 Table I. Medicare Severity-Diagnosis Related Group (MS-DRG) Codes for the Bundled Payment for Care Improvement Advanced (BPCI-A) Program.

adults.¹² Age-Friendly Health Systems offers an evidencebased, accessible framework—the 4Ms (What Matters, Medication, Mentation, and Mobility)—adaptable to any care environment and inter-professional team.¹³

Oregon Health & Science University (OHSU) is a safety net, Level 1 trauma and academic medical center with 576 inpatient beds in Portland, Oregon. Inpatient admissions of adults 70 years and older have steadily increased to over 8000 in 2023. OHSU has been a Level 2 certified Age-Friendly Health System since 2020, with standardized work supporting all 4Ms and capturing reliable data on care delivery.

"Value" is the worth, importance and usefulness of an item, tangible or intangible, and fundamentally differs by the perspectives of people and groups.¹⁴ Value in healthcare has been defined in different ways, traditionally focusing on cost, but the concept of "value-based care" has evolved to include cost, quality, and what patients desire from their care.¹⁵ Value-based care today encourages care teams to think beyond their setting and work toward common goals like maintaining function and independence to recover at home rather than in a care facility.

OHSU is committed to adoption and implementation of value-based care methodologies, including participating in the Centers for Medicare & Medicaid Services (CMS) innovation model, Bundled Payment for Care Improvement Advanced (BPCI-A), from 2018 to 2022. The BPCI-A model was trialed as an alternative to the traditional fee-for-service payment model and combined reimbursement of physician, hospital, and other healthcare services during a 90-day period into a single bundled payment amount.¹⁶ A BPCI-A clinical episode could begin at the start of an inpatient admission to an acute care hospital or at the start of an outpatient procedure in a hospital outpatient department.¹⁶ Hospital admissions that qualified for BPCI-A were defined by Medicare Severity-Diagnosis Related Group (MS-DRG) codes. Table 1 displays the clinical episode categories and corresponding MS-DRG codes. Our institution voluntarily participated in BPCI-A with the aligned goals of improving transitions of care, post-acute care utilization, care coordination, and quality of care for patients during the 90-day episode. One key focus of BPCI-A was to discharge patients home and healthy following their surgery or hospital admission and maximize their days at home during the 90-day episode. As most hospitalized patients prefer to spend more time at home than in an institutional environment, an important outcome of OHSU's BPCI-A program was the number of days spent by each patient in their home, private residence or long-term care domicile during their 90-day episode. Our institution had great success showing a positive overall net payment reconciliation amount of over \$2.2M after participation in the model.

Value-based care programs aim to identify, implement, and scale interventions that match patient goals to care, minimize hospital-related harm, reduce delays returning home, and streamline the post-acute phase of care. As shown in

	During Hospitalization	At Discharge	Days 1-90 Post Discharge	
		[1	
Scenario #1	What Matters: Goals not discussed with patient Medication: Given Cefepime, pain under-treated Mentation: Poor sleep, developed delirium and acute dysphagia requiring enteral feeding Mobility: Became lift-dependent after 4 days spent in bed	Unable to return home, goes to post-acute rehab	 Dysphagia persists leading to <u>two</u> ED visits for aspiration pneumonitis. Cognition plateaus with persistent impairments. Falls in rehab and readmitted to the hospital with multiple vertebral fractures. Living in ICF at day 90 	
			1	
Scenario #2	What Matters: Goals discussed with patient at admission and then daily Medication: Reviewed medication list for appropriateness and pain managed Mentation: Assessed for delirium with CAM screening every shift, sleep supported Mobility: Bedside mobility screen completed each shift, patient assisted to chair and hallway walks using a walker three times a day	Returns home with walker, extra caregiving check-ins and home health	 Follows up in outpatient clinics with no ED, hospital, or post-acute care utilization. Graduated from temporary augmented caregiving. 	

Figure I. Conceptual model of how hospital-related events affect patients after hospital discharge using 2 separate scenarios. This hypothetical 82-year-old admitted from home with acute cholangitis. They were normally ADL/IADL independent, cognitively intact, and used a single point cane and hearing aids at baseline.

Figure 1, hospital-related events such as delirium often extend beyond the hospital walls and impact function and discharge planning. Evidence supports the 4Ms as best practice for care for older adults across all settings of care and may be an effective tactic to reliably deliver value for patients. A recent study assessing clinical and quality outcomes pre- and post-Age Friendly implementation at a Veterans Affairs skilled nursing facility found improvements including less rehospitalization, fewer emergency department visits, and greater patient satisfaction.¹⁷ Another study by Burke et al showed a small improvement in facility-free days for Veterans receiving outpatient or inpatient care at Age-Friendly recognized locations compared to non-Age-Friendly locations.¹⁸ Our investigation describes the association between receipt of all 4Ms during an index hospital stay and days spent at home in the 30 and 90 days following discharge.

Methods

Data Collection

For this retrospective cross-sectional study, administrative data were collected for all patients aged 65 years and older admitted to OHSU from September 2020 through December 2022 with lengths of stay greater than 1 full day. Each admission was assessed for receipt of Age-Friendly care and analyzed in 2 groups: received and not received.

An Age-Friendly admission must have received specific care priorities set by our institution in each of the 4Ms: What Matters, Mentation, Medication, and Mobility. What Matters was met by documenting the patient's specific goal daily or documenting a surrogate decision maker in the electronic health record. Medication was met by not prescribing select potentially inappropriate medications during the hospitalization. The medication classes included benzodiazepines, sedative-hypnotics, tricyclic antidepressants, select anticholinergics (scopolamine, diphenhydramine, hydroxyzine), and skeletal muscle relaxants. Mentation was met when the Confusion Assessment Method¹⁹ (CAM or CAM-ICU) was completed at least once every 2 days. Mobility was met when the Morse Fall Scale,²⁰ Braden Scale,²¹ or local mobility screen to assess mobility readiness and level of assistance was completed at least once a day.

As part of our enrollment in BPCI-A, OHSU regularly received Medicare claims data for the index hospitalization and other services, including emergency department, hospital, skilled nursing facility, home health agency, and hospice stays, provided during the 90-day episode. Only patients with traditional Medicare plans admitted under specified DRGs listed in Table 1 were included. These claims data were used to calculate days in a facility (eg, emergency department, hospital, skilled nursing facility) and days at home (eg, private residence, nursing home, or assisted living facility) including patients utilizing home health and hospice services. Death data were also collected.

The claims dataset from September 2020 through December 2022 was merged with the Age-Friendly 4Ms measures dataset to create a cohort of BPCI-A admissions that could be divided into 2 groups—4Ms recipients and non-recipients. Non-recipient status was defined by an admission not receiving all 4Ms, as they are designed to be delivered as a set.

Outcome Variable

The outcome metric was the proportion of days alive spent at home out of the number of eligible days at home. The

Table 2. Demographic Characteristics by Age-Friendly Status Before and After Weighting.

Characteristic	Pre-weighting		Post-weighting			
	4Ms not received (n=348)	4Ms received (n=275)	P-value	4Ms not received (n=626)	4Ms received (n=618)	P-value
Age, mean (SD)	75.38 (6.93)	77.33 (7.79)	.001	76.30 (7.32)	76.43 (7.57)	.836
Male, n (%)	162 (46.6)	157 (57.1)	.011	326.8 (52.2)	323.0 (52.3)	.995
Race, n (%)			.072			.037
White	308 (88.5)	229 (83.3)		552.2 (88.3)	507.0 (82.0)	
Asian	5 (1.4)	14 (5.1)		8.4 (1.3)	35.7 (5.8)	
Black	2 (0.6)	4 (1.5)		4.2 (0.7)	10.2 (1.7)	
Other	5 (1.4)	5 (1.8)		8.4 (1.3)	11.5 (1.9)	
Unknown	28 (8.0)	23 (8.4)		52.4 (8.4)	53.6 (8.7)	
Ethnicity, n (%)			.983			.982
Non-Hispanic	291 (83.6)	231 (84.0)		523.4 (83.7)	517.3 (83.7)	
Unknown	51 (14.7)	39 (14.2)		92.3 (14.8)	89.8 (14.5)	
Hispanic	6 (1.7)	5 (1.8)		9.9 (1.6)	10.9 (1.8)	
Admission type, n (%)			.006			.999
Medical	28 (8.0)	44 (16.0)		72.9 (11.6)	73.1 (11.8)	
Surgical	134 (38.5)	112 (40.7)		249.4 (39.9)	247.0 (40.0)	
Trauma	5 (1.4)	5 (1.8)		8.9 (1.4)	8.9 (1.4)	
Emergent	181 (52.0)	114 (41.5)		294.5 (47.1)	288.9 (46.7)	
Case Mix Index, mean (SD)	3.37 (2.24)	3.25 (2.18)	.501	3.32 (2.21)	3.31 (2.23)	.987
Risk-adjusted mortality, mean (SD)	0.05 (0.12)	0.03 (0.07)	.009	0.04 (0.10)	0.04 (0.10)	.843

maximum number of eligible days at home was 30 and 90 for each respective model. Patients who died before the end of the period had a shorter eligible period.

Statistical Analysis

Descriptive analysis for demographic and admission characteristics was conducted by Age-Friendly status using chisquare or Fisher's exact tests for categorical variables and *t*-test or Mann-Whitney test for continuous variables. A multivariable logistic regression model with inverse probability of treatment weighting was utilized to address potential confounding. Variables for the weighting included sex, admission type, age, case mix index, and risk-adjusted mortality.

Zero-one-inflated beta regression models with inverse probability treatment weighting were created to assess any differences in the probability of spending days at home or a facility by Age-Friendly status. Admissions with missing data were excluded. This model type was used to account for the cutoffs at 0 and 1. Statistical analyses were performed in R version 4.1.3 and used the *gamlss* package²² for model creation.

Two sensitivity analyses were conducted to evaluate different exposure definitions. The first model excluded all admissions receiving 3Ms. This would reduce the sample size but allow for a cleaner comparison between the groups. The second model grouped admissions receiving 3Ms and 4Ms together, and compared to the group that received 0, 1, or 2Ms. This model would maximize the sample size but violate the goal of delivering the 4Ms as a set.

This study was conducted in accordance with the ethical principles outlined in the Declaration of Helsinki, as revised in 2013, by the World Medical Association and followed the Strengthening the Reporting of Observational Studies in Epidemiology (STROBE) guidelines (Supplemental File).²³

Results

From September 2020 through December 2022, 623 admissions in the BPCI-A program met our inclusion criteria. Five admissions were excluded for missing data on case-mix index (n=3) and risk-adjusted mortality (n=5). The sample was 51.2% male, 83.8% non-Hispanic, and 86.2% White with an average age of 76.2 ± 7.4 years. There were 275 admissions receiving Age-Friendly care and 348 not receiving Age-Friendly care. Out of admissions not receiving Age-Friendly care, 26 only met 1M, 93 met 2Ms, and 229 met 3Ms. Age-Friendly care patients tended to be older (77.3 vs 75.4 years, P=.001), male (57.1% vs 46.6%, P=.01), nonemergent (58.6% vs 48.0%, P=.006), and had a lower risk-adjusted mortality (0.03 vs 0.05, P=.006). After propensity score matching, these were no longer significantly different between groups (Table 2).

The unadjusted, average proportion of eligible days spent at home was not significantly different between groups. Out of 30 days, Age-Friendly recipients spent an average of 85.2% of their eligible days at home compared to 86.2% for non-Age-Friendly recipients (P=.68). Out of 90 days, Age-Friendly recipients spent an average of 91.4% of their eligible days at home compared to 91.0% for non-Age-Friendly recipients (P=.79).

In the propensity-adjusted model for 30 days post-discharge, the probability of spending all eligible days in facilities such as skilled nursing, ED, or hospital environments was the same for both groups (.059 vs .063, P=.95). The probability of spending all eligible days at home—private home or long-term care—for those not receiving Age-Friendly care was .69 compared to .67 for those receiving Age-Friendly care (P=.34).

In the 90-day model, the probability of spending all eligible days in a facility for those not receiving Age-Friendly care was .010 compared to .015 for those receiving Age-Friendly care (P=.34). The probability of spending all eligible days at home for those not receiving Age-Friendly care was .54 compared to .57 for those receiving Age-Friendly care (P=.23).

Sensitivity Analysis

In the 30-day model excluding the 3Ms, there were significant differences between groups for those spending all eligible days in a facility and all eligible days at home. The probability of spending all eligible days in a facility for those not receiving Age-Friendly care in the hospital was .089 compared to .062 for those receiving Age-Friendly care (P=.02). The probability of spending all eligible days at home for those not receiving Age-Friendly care was .72 compared to .67 (P=.02). The 90-day model excluding the 3Ms was no longer significant for days at the facility or at home.

In the 30-day model combining 3Ms and 4Ms, those receiving Age-Friendly care had a significantly lower probability of spending all eligible days in a facility compared to those not receiving Age-Friendly care (.043 vs .071, P < .001). The probability of spending all eligible days at home was also significantly different for those receiving Age-Friendly care and those not (.66 vs .74, P < .001). In the 90-day model combining 3Ms and 4Ms, the probability of spending all eligible days at a facility was no longer significantly different between groups (P=.39). The probability of spending all eligible days at home for those not receiving Age-Friendly care was .60 compared to .50 for those receiving Age-Friendly care (P < .001).

Discussion

This retrospective analysis demonstrated that assessment level 4Ms care during a hospital admission significantly impacts the probability of spending up to 30 subsequent days at home or a facility for older hospitalized patients enrolled in the BPCI-A program. However, the effect dissipates by 90 days post-discharge. Our original analysis was nullified by the group of admissions receiving 3Ms. Sensitivity analyses showed that patients receiving less than 3Ms had a higher probability of spending their eligible days in a facility compared to those receiving 3 or 4Ms. There are 3 key takeaways from this study:

 Hospital-based events, including those as simple as provision of assessment-level 4Ms care, have an objective and measurable impact on the first month after discharge. This validates a common experience among those who care for older adults and support the core premise of value-based care programs.

- The Age-Friendly 4Ms are a promising and practical intervention to include in value-based care programs like the upcoming Transforming Episode Accountability Model (TEAM) bundled payment model.
- The "tipping point" at which we see improvement in post-hospitalization utilization seems to be receipt of at least 3Ms during the hospital stay.

Hospitalization is a crucial time during the overall experience of illness or injury and what happens during a hospitalization can impact much of what comes afterward. This analysis focused on how providing Age-Friendly care during a hospitalization might impact outcomes post-discharge and demonstrates impact on utilization that reaches across the first month. If we extend this finding to the entire episode of illness-primary/chronic illness care, admission and postadmission recovery-we hypothesize that setting-specific 4Ms delivery could further improve system utilization. Spread and scale of Age-Friendly Health Systems may need to extend beyond the hospital walls to post-acute care environments after admission and primary care both before and after admission to truly maximize days spent at home after an acute illness, surgery or injury episode. The ideal state likely to positively impact a patient-centered outcome like "days at home" is a coordinated and integrated system that delivers high quality 4Ms care at every touch and lowers barriers to transferring 4Ms-based care plans with the patient as they move through the system. The next generation of Age-Friendly Health Systems as a successful value-based care tactic is building and maintaining bridges to multiple settings of care and community partners that already participate in episodes of care.

This work highlights "days at home" as a patient-centered and value-based outcome that moves beyond hospital length of stay. This measure may better reflect the ideal outcome for patients moving through an acute illness and matches the commonly held goal among older patients of wanting to be in their home. Future work is needed to assess the impact on a larger, more representative hospital cohort, with Act On-level 4Ms care delivery and within an integrated care network.

Limitations

This study had some limitations to note. First, the patient cohort was limited to a single academic medical center, specific admission DRGs and was further limited to traditional Medicare recipients, who tend to live with more chronic conditions and complex healthcare needs. Advantage plan members and Medicaid-dual eligible patients make up a significant

proportion of our inpatient population but were excluded from the analysis as claims data through BPCI-A did not include those payers. No sample size calculations were performed as we used all available data. Access to Medicare claims data from the entire 90-day episode of care was a critical element for this investigation and can be difficult to obtain from payers, notably a limitation to repeating this analysis in different settings or with different patient populations. Participation in the BPCI-A model provided access to these data but may have inherently changed care practice during the hospital admission and post-discharge. At the time of this investigation, standard Age-Friendly care was limited to assessment-level processes and may not have truly reflected how hospital staff acted on positive screens. Therefore, there is more to be learned about the stage of Age-Friendly system development and the impact on the 90-day episode of care. Age-Friendly care is intended to be delivered as a set and to maximize our sample size, we considered admissions where patients received anything less than all 4Ms as "not receiving Age-Friendly care." Sensitivity analyses were performed to address different definitions of our exposure measure. Lastly, though it minimizes confounding, propensity score matching further limited the cohort size. In this case, the relatively small comparison groups may not have been large enough to show a statistically significant difference.

Conclusions

The Age-Friendly Health System model has significant potential as a value-based care tactic and intervention. It is unique in its potential for impact throughout the settings of care that older adults regularly navigate and fits the broader, integrated system view that value-based care programs embrace. This analysis suggests that impacting important episodes-based and patient-centered outcomes is going to require champions across settings to reach beyond their walls, link local Age-Friendly efforts together and use broad measures like "days at home" to reflect that paradigm shift.

Acknowledgments

We would like to thank Seiji Koike, MAS from OHSU's Biostatistics and Design Program for his contribution to the analysis plan and interpretation. We would like to thank Konrad Dobbertin, MPH for accessing and sharing the Medicare claims data with our team.

Author Contributions

KD and BD contributed to the conceptualization and study design. KD, BD, and SR acquired the data. BD analyzed and interpreted the data. KD, BD, and SR drafted the manuscript. All authors reviewed and approved the final manuscript.

Data Availability Statement

De-identified data are available upon request.

Declaration of Conflicting Interests

The author(s) declared no potential conflicts of interest with respect to the research, authorship, and/or publication of this article.

Funding

The author(s) received no financial support for the research, authorship, and/or publication of this article.

Ethical Considerations

OHSU Institutional Review Board (IRB) exempted this study (#22244).

Consent to Participate

The requirement for informed consent to participate has been waived by the IRB.

ORCID iDs

Kathleen Drago D https://orcid.org/0000-0003-0086-5197 Bryanna De Lima D https://orcid.org/0000-0002-4603-4084 Elizabeth Eckstrom D https://orcid.org/0000-0002-5079-5767 Ella Bowman D https://orcid.org/0000-0001-6717-4652

Supplemental Material

Supplemental material for this article is available online.

References

- Centers for Disease Control and Prevention. People with hospital stays in the past year, by selected characteristics: United States, selected years 1997-2019. Accessed July 26, 2024. https://www.cdc.gov/nchs/data/hus/2020-2021/ HospStay.pdf
- Levant S, Chari K, DeFrances CJ. Hospitalizations for Patients Aged 85 and Over in the United States, 2000-2010. Centers for Disease Control and Prevention; 2015. Accessed February 1, 2024. https://www.cdc.gov/nchs/products/databriefs/db182. htm
- Inouye SK, Westendorp RG, Saczynski JS. Delirium in elderly people. *Lancet*. 2014;383(9920):911-922. doi:10.1016/s0140-6736(13)60688-1
- Babine RL, Hyrkäs KE, Hallen S, et al. Falls and delirium in an acute care setting: a retrospective chart review before and after an organisation-wide interprofessional education. *J Clin Nurs*. 2018;27(7-8):e1429-e1441. doi:10.1111/jocn.14259
- Dubrall D, Just KS, Schmid M, Stingl JC, Sachs B. Adverse drug reactions in older adults: a retrospective comparative analysis of spontaneous reports to the German Federal Institute for Drugs and Medical Devices. *BMC Pharmacol Toxicol*. 2020;21(1):25. doi:10.1186/s40360-020-0392-9
- Szlejf C, Farfel JM, Curiati JA, de Barros Couto Junior E, Jacob-Filho W, Azevedo RS. Medical adverse events in elderly hospitalized patients: a prospective study. *Clinics*. 2012;67(11):1247-1252. doi:10.6061/clinics/2012(11)04

- Cantor N, Durr KM, McNeill K, et al. Increased mortality and costs associated with adverse events in intensive care unit patients. *J Intensive Care Med.* 2022;37(8):1075-1081. doi:10.1177/08850666221084908
- van Lieshout C, Schuit E, Hermes C, Kerrigan M, Frederix GWJ. Hospitalisation costs and health related quality of life in delirious patients: a scoping review. *Z Evid Fortbild Qual Gesundhwes*. 2022;169:28-38. doi:10.1016/j.zefq.2022. 02.001
- Dykes PC, Curtin-Bowen M, Lipsitz S, et al. Cost of inpatient falls and cost-benefit analysis of implementation of an evidence-based fall prevention program. *JAMA Health Forum.* 2023;4(1):e225125. doi:10.1001/jamahealthforum. 2022.5125
- Lee-Steere K, Liddle J, Mudge A, Bennett S, McRae P, Barrimore SE. "You've got to keep moving, keep going": understanding older patients' experiences and perceptions of delirium and nonpharmacological delirium prevention strategies in the acute hospital setting. *J Clin Nurs*. 2020;29(13-14):2363-2377. doi:10.1111/jocn.15248
- Redley B, Taylor N, Hutchinson AM. Barriers and enablers to nurses' use of harm prevention strategies for older patients in hospital: a cross-sectional survey. J Adv Nurs. 2022;78(11):3710-3720. doi:10.1111/jan.15269
- Mate KS, Berman A, Laderman M, Kabcenell A, Fulmer T. Creating age-friendly health systems – a vision for better care of older adults. *Healthcare*. 2018;6(1):4-6. doi:10.1016/j. hjdsi.2017.05.005
- Mate K, Fulmer T, Pelton L, et al. Evidence for the 4Ms: interactions and outcomes across the care continuum. *J Aging Health*. 2021;33(7-8):469-481. doi:10.1177/0898264321991658
- Merriam-Webster. Definition of Value. October 18, 2024. Accessed October 18, 2024. https://www.merriam-webster. com/dictionary/value

- CMS. Value-Based Care. CMS. Accessed August 7, 2024. https://www.cms.gov/priorities/innovation/key-concepts/ value-based-care
- CMS. BPCI Advanced. CMS. Accessed August 7, 2024. https:// www.cms.gov/priorities/innovation/innovation-models/bpciadvanced
- King SE, Ruopp MD, Mac CT, et al. Early clinical and quality impacts of the age-friendly health system in a veterans affairs skilled nursing facility. *J Am Geriatr Soc.* 2024;72(12):3865-3874. doi:10.1111/jgs.19083
- Burke RE, Tjader A, Church K, Munro S, Rose L. Evaluating the relationship between facility age-friendly recognition and subsequent facility-free days in older veterans. *J Am Geriatr Soc.* 2024;72(8):2329-2335. doi:10.1111/jgs.18962
- Inouye SK, Bogardus ST Jr, Charpentier PA, et al. A multicomponent intervention to prevent delirium in hospitalized older patients. N Engl J Med. 1999;340(9):669-676. doi:10.1056/ nejm199903043400901
- Morse JM, Morse RM, Tylko SJ. Development of a scale to identify the fall-prone patient. *Can J Aging*. 1989;8(4):366-377. doi:10.1017/S0714980800008576
- Bergstrom N, Braden BJ, Laguzza A, Holman V. The Braden Scale for predicting pressure sore risk. *Nurs Res.* 1987;36(4):205-210.
- Stasinopoulos M, Rigby R. gamlss: Generalized Additive Models for Location Scale and Shape. R package version 5.4-22. Published online August 14, 2012. doi:10.32614/CRAN. package.gamlss
- von Elm E, Altman DG, Egger M, Pocock SJ, Gøtzsche PC, Vandenbroucke JP. The Strengthening the Reporting of Observational Studies in Epidemiology (STROBE) statement: guidelines for reporting observational studies. *Lancet*. 2007;370(9596):1453-1457. doi:10.1016/S0140-6736(07)61602-X