

**Physician-Focused Payment Model Technical Advisory Committee
LOI: Environmental Scan & Relevant Literature**

**Avera Health
Letter Dated: 3/2/2017
Letter Received: 3/3/2017**

Avera Health is proposing the Intensive Care Management in Skilled Nursing Facilities Alternative Payment Model (ICM SNF APM) which is based on the Avera Virtual Care Center Center for Medicare and Medicaid Innovation Round 2 Health Care Innovation Award in 2014. This model leverages board-certified geriatrician's expertise across geography, population, and clinical teams using an interactive telecommunications system for encounters. Additionally, this model requires participating organizations to provide a comprehensive multidisciplinary geriatric program, which includes geriatrician-led intensive care management teams, transitional care support, immediate 24/7 access to a provider for urgent/acute care diagnosis and treatment, mentoring for nurses and assistants, quality and performance improvement activities.

The geriatrician-led clinical team would deliver care for residents in Skilled Nursing Facilities (SNF) and would receive a Per Beneficiary Per Month (PBPM) reimbursement adjusted by the beneficiaries' skilled or unskilled status. Care would be available in person, via telemedicine, and in urban and rural settings. To manage risks, newly participating providers would be paid a percentage of the monthly care management fee during the first 12 months of participation. Annual reporting would qualify the provider to receive up to 100% of the PBPM fee based on population health quality targets that include measureable reductions in hospital admissions, hospital readmissions, and use of emergency services. The model would suspend co-payment by beneficiaries and not require beneficiary consent to participate beyond existing standard consent to treat. Expected participants include Medicare beneficiaries admitted to select SNFs including dual-eligible beneficiaries. This model would be available to 7,500 board certified geriatricians practicing in the US as well as other qualifying providers participating on their care teams.

Key Search Terms

Avera Health; MACRA legislation; CMS; Skilled Nursing Facility (SNF); Payment Model; Avera eCare; Biopsychosocial Model; Geriatric Telemedicine; Telemedicine; Medicare; Intensive Care; ICU; Payment Model

Research Task	Section	Contents
Environmental Scan	Section 1	Key documents, timely reports, grey literature, and other materials gathered from internet searches (5).
Relevant Literature	Section 2	Relevant literature materials (6).
Related Literature	Section 3	Related literature materials (3).

Section 1. Environmental Scan

Environmental Scan		
<i>Key words: Avera Health, MACRA legislation</i>		
Organization	Title	Date
Avera Health	Avera Health Public Comment: Medicare Program; Merit-Based Incentive Payment System (MIPS) and Alternative Payment Model (APM) Incentive Under the Physician Fee Schedule, and Criteria for Physician-Focused Payment Models	6/24/2016
Purpose/Abstract		
<p>Background: On June 24, 2016, Avera Health provided the Centers for Medicare & Medicaid Services (CMS) formal comments on the CMS' Medicare Program; Merit-Based Incentive Payment System (MIPS) and Alternative Payment Model (APM) Incentive Under the Physician Fee Schedule, and Criteria for Physician-Focused Payment Models proposed rule.</p> <p>Summary: Beginning on page 9 of the public comment letter, Avera Health addresses their stance regarding several aspects of CMS' proposed rule. Comments express Avera's stance regarding aspects of CMS' proposed rule, including: 1) the use of certified electronic health record technology (CEHRT); 2) financial risk for monetary losses; 3) the nominal amount of risk; 4) services furnished through critical access hospitals (CAH), Federally Qualified Health Centers (FQHC), and Rural Health Clinics (RHC); and 5) other payer advanced APM criteria.</p>		
Additional Notes/Comments		
Federal Register Proposed Rule		

Environmental Scan		
<i>Key words: Avera Health, CMS</i>		
Organization	Title	Date
Center for Medicare & Medicaid Services	Evaluation of the Round Two Health Care Innovation Awards (HCIA R2) First Annual Report	8/1/2017
Purpose/Abstract		
<p>Background: This annual report: (1) highlights variation in awardee and program characteristics, including differences in the awardees' service delivery and payment models; (2) synthesizes the implementation experience of the 39 awardees, identifying the barriers and facilitators they encountered during the first year of program implementation and, when possible, highlighting strategies for effectively overcoming the first-year implementation challenges; and (3) summarizing the results from our impact evaluability assessments. Additionally, the report highlights the challenges involved in identifying credible comparison groups and timely administrative data for awardees that appear to meet the evaluability criteria at this phase of operations and outlines the methods intended to use to overcome these challenges.</p> <p>Summary: The report presents the findings for each of the 39 awardee programs individually in Appendix B. Please find an evaluation of Avera Health's eLongTermCare (eLTC) program in appendix B.5 of the report. In appendix B.5, the report presents a general description of the eLTC program, findings from qualitative analyses, implementation effectiveness, implementation challenges and the strategies developed to address those challenges, awardee level decision making towards program-related changes, and the extent to which the awardee has begun to plan/implement payment reforms.</p>		
Additional Notes/Comments		
Health Care Innovation Award Round Two: Avera Health - Avera Virtual Care Center Project Profile		

Environmental Scan		
<i>Key words: Avera Health, Skilled Nursing Facility, Payment Model</i>		
Organization	Title	Date
Centers for Medicare & Medicaid Services	Bundled Payments for Care Improvement Initiative Model 2: Retrospective Acute & Post Acute Care Episode	Accessed on: 3/15/2017 Last Updated: 2/13/2017
Purpose/Abstract		
<p>Background: The Bundled Payments for Care Improvement initiative Model 2 involves a retrospective bundled payment arrangement where actual expenditures are reconciled against a target price for an episode of care. Under this payment model, Medicare continues to make fee-for-service (FFS) payments to providers and suppliers furnishing services to beneficiaries in Model 2 episodes. Total expenditures for a beneficiary's episode is later reconciled against a bundled payment amount (the target price) determined by CMS. Medicare makes a payment or recoups funds reflecting the aggregate performance compared to the target price. In Model 2, the episode of care includes a Medicare beneficiary's inpatient stay in the acute care hospital, post-acute care and all related services during the episode of care, which ends either 30, 60, or 90 days after hospital discharge. Awardees select up to 48 different clinical episodes to test in the model.</p> <p>Summary: Avera McKennan Hospital & University Health Center (Sioux Falls, SD) is a BPCI Phase 2 Model 2 Awardee as of January 1, 2017.</p>		
Additional Notes/Comments		

Environmental Scan		
<i>Key words: Avera eCare</i>		
Organization	Title	Date
Avera Health	White Paper: Delivering Health Care of the Future Today	2/1/2015
Purpose/Abstract		
<p>Background: Avera eCare is Avera Health's telemedicine solution aimed at addressing the challenges faced in rural health care. In 1993, Avera first offered 24/7 eConsult services to rural, frontier and critical access hospitals as part of eCare. In 2003, Avera expanded eCare to include eICU care. By 2009, through The Leona M. and Harry B. Helmsley Charitable Trust, Avera began eEmergency and ePharmacy as part of the wider eCare service. In 2012, Avera initiated eCare services for long-term care and correctional care. In all, Avera eCare currently maintains six telemedicine services that operate 24 hours a day, 7 days a week.</p> <p>Summary: This white paper discusses the benefits, partnerships, and history of the Avera eCare model. Additionally, the paper briefly details the six main services that comprise the overall eCare service, which includes eICU, eConsult, eEmergency, ePharmacy, eLongTermCare, and eCorrectional Health. Since this report's publication, Avera's eCare service has served 263 sites throughout 12 states.</p>		
Additional Notes/Comments		
Farris, D. (2015). <i>"Delivering Health Care of the Future Today"</i> (White paper). Avera Health, Sioux Falls, SD: Avera eCare.		

Environmental Scan		
<i>Key words: Biopsychosocial model</i>		
Organization	Title	Date
Annals of Family Medicine	The Biopsychosocial Model 25 Years Later: Principles, Practice, and Scientific Inquiry	11/1/2004
Purpose/Abstract		
<p>Background: In 1977, Dr. George Engel wrote a paper offering his views on how clinicians should alternatively attend to and understand a patient's needs. He proposed a model, named the biopsychosocial model, where the clinicians must attend simultaneously to the biological, psychological, and social dimensions of illness. Dr. Engel's primary aim was to improve patient care through the three aforementioned dimensions.</p> <p>Summary: This article both defends the biopsychosocial model and proposes a biopsychosocial-oriented clinical practice which includes several pillars: 1) self-awareness; 2) active cultivation of trust; 3) an emotional style characterized by empathic curiosity; 4) self-calibration as a way to reduce bias; 5) educating the emotions to assist with diagnosis and forming therapeutic relationships; 6) using informed intuition; and 7) communicating clinical evidence to foster dialogue. Beginning on page 3 of the PDF document, the authors discuss the "relationship-centered" care approach and the biopsychosocial model's application into relationship-centered care.</p>		
Additional Notes/Comments		
<p>https://www.ncbi.nlm.nih.gov/pmc/articles/PMC1466742/#r1</p> <p>LOI indicates that participating providers in this model are based on the biopsychosocial model.</p>		

Section 2. Relevant Literature

Relevant Literature		
<i>Key words: Geriatric telemedicine</i>		
Organization	Title	Date
Telemedicine Journal and E-Health	Designing Telemedicine Systems for Geriatric Patients: A Review of the Usability Studies	11/22/2016
Purpose/Abstract		
<p>Background: One area where telemedicine may prove to be highly effective is in providing medical care to the geriatric population, an age group predicted to account for 20% of the population in the near future. However, even though telemedicine has certain advantages, the usability of these systems with this population merits investigation.</p> <p>Materials and Methods: This article reviews the literature published from 2000 to 2016 with the goal of analyzing the characteristics of usability-related studies conducted using geriatric participants and the subsequent usability challenges identified. Articles were found using Web of Knowledge and PubMed citation indexing portals using the keywords (1) Telemedicine* AND Geriatrics* (2) Telemedicine* AND Usability* (3) Telemedicine* AND Usability* AND Older Adults*.</p> <p>Results: A total of 297 articles were obtained from the initial search. After further detailed screening, 16 articles were selected for review based on the inclusion criteria. Of these, 60% of the studies focused on the overall usability of telemedicine systems; 6.25% focused on the usability of a telepresence robot; 12.5% compared a face-to-face medical consultation with the use of telemedicine systems, and 25% focused on the study of other aspects of telemedicine in addition to its usability. Findings reported in the studies included high patient satisfaction with telemedicine in 31.25%, whereas another 31.25% indicated a high acceptance of this method of medical consultation. Care coordination in 6.25% of the studies; confidence in telemedicine in 6.25%; trust, privacy, and reliability in 6.25%; and increased convenience when compared to personal visits in 18.75% were also reported.</p> <p>Conclusions: This review suggests limited research providing scientifically valid and reproducible usability evaluation at various stages of telemedicine system development. Telemedicine system designers need to consider the age-related issues in cognition, perception, and behavior of geriatric patients while designing telemedicine applications. Future directions for research were developed based on the identified limitations as well as other results found in this systematic review.</p>		
Additional Notes/Comments		
Narasimha, S., Madathil, K. C., Agnisarman, S., Rogers, H., Welch, B., Ashok, A., ... McElligott, J. (2017). Designing Telemedicine Systems for Geriatric Patients: A Review of the Usability Studies. <i>Telemedicine and E-Health</i> , 23(6), 459–472. https://doi.org/10.1089/tmj.2016.0178		

Relevant Literature		
Key words: Telemedicine; skilled nursing facilities (SNF)		
Organization	Title	Date
Journal of Applied Gerontology	Perceived Benefits, Barriers, and Drivers of Telemedicine From the Perspective of Skilled Nursing Facility Administrative Staff Stakeholders	5/5/2016
Purpose/Abstract		
<p>Introduction: Potentially avoidable hospitalizations (PAHs) of skilled nursing facility (SNF) patients are common and costly. Telemedicine represents a unique approach to manage and potentially reduce PAHs in SNFs, having been used in a variety of settings to improve coordination of care and enhance access to providers. Nonetheless, broad implementation and use of telemedicine lags in SNFs relative to other health care settings.</p> <p>Methods: The authors administered a survey to SNF administrative staff attending a 1-day telemedicine summit jointly hosted by University of Pittsburgh Medical Center (UPMC) Community Provider Services and HealthMEDX®. Nineteen administrative staff attended the summit, representing nine companies that own and/or manage almost 90 SNFs with more than 9,000 beds across 18 states. This convenience sample was comprised of existing or potential HealthMEDX® (Ozark, Missouri) electronic medical record clients. Researchers received surveys from 15 attendees, at a response rate of 79%. The survey included the following domains: (a) perceived telemedicine benefits, (b) factors influencing adoption of telemedicine, (c) obstacles to adoption of telemedicine, and (d) overall view of the role of telemedicine in SNFs. Respondents were asked to rate the importance of a series of factors using a 10-point Likert-type scale, where higher scores indicated greater importance. The fourth domain was posed as a multiple-choice question with four response options. One of the authors (SMH) administered the survey.</p> <p>Results: Most of those surveyed placed emphasis on the potential for telemedicine to improve quality of care (M=9.29, SD=0.83) and manage readmissions (M=9.20, SD=1.26). The factors deemed least relevant were shortening length of stay (M=7.60, SD=1.92) and expanding service lines (M=7.27, SD=2.43). The most influential driver identified was hospitals making telemedicine a requirement of their SNF partners (M = 8.47, SD = 2.26). Other factors, such as the requirements of managed care (M=8.40, SD=1.55) and affordable care organizations (ACOs; M=8.13, SD=2.42) for SNF partners, were regarded as fairly influential. The decline in technology related costs was regarded as the least important driver of adoption (M=6.73, SD=2.15). The biggest perceived obstacle to respondents' adoption of telemedicine was the initial investment required (M=7.20, SD=2.24). Of secondary importance were obstacles such as measurable return on investment (M=6.33, SD=2.79). The factor least regarded as an impediment was difficulties learning to use telemedicine (M=4.07, SD=2.28).</p> <p>Conclusions: Findings suggest that while SNFs perceive telemedicine to potentially add value to care delivery, there are significant informational and financial barriers to realizing those benefits. In practice, the underdeveloped state of HIT in SNFs creates an opportunity for SNF administrators to proactively identify how, and under what circumstances, telemedicine could improve the quality of care in their facilities or potentially allow them to participate in alternative payment models such as the Comprehensive Care for Joint Replacement (CCJR). In terms of policy, more creative investment arrangements should be pursued, and alternative payers could be targeted through incentives.</p>		
Additional Notes/Comments		

Driessen, J., Castle, N. G., & Handler, S. M. (2018). Perceived benefits, barriers, and drivers of telemedicine from the Perspective of Skilled Nursing Facility Administrative Staff Stakeholders. *Journal of Applied Gerontology*, 37(1), 110–120.

Relevant Literature		
Key words: Telemedicine, Medicare; intensive care		
Organization	Title	Date
Medical Care	ICU Telemedicine and Critical Care Mortality: A National Effectiveness Study	3/1/2016
Purpose/Abstract		
<p>Background: Intensive care unit (ICU) telemedicine is an increasingly common strategy for improving the outcome of critical care, but its overall impact is uncertain.</p> <p>Objectives: To determine the effectiveness of ICU telemedicine in a national sample of hospitals and quantify variation in effectiveness across hospitals.</p> <p>Research Design: The authors performed a multicenter retrospective case-control study using 2001-2010 Medicare claims data linked to a national survey identifying US hospitals adopting ICU telemedicine. Authors matched each adopting hospital (cases) to up to 3 non-adopting hospitals (controls) based on size, case-mix, and geographic proximity during the year of adoption. Using ICU admissions from 2 years before and after the adoption date, the authors compared outcomes between case and control hospitals using a difference-in-differences approach.</p> <p>Results: A total of 132 adopting case hospitals were matched to 389 similar non-adopting control hospitals. The preadoption and postadoption unadjusted 90-day mortality was similar in both case hospitals (24.0% vs. 24.3%, P=0.07) and control hospitals (23.5% vs. 23.7%, P<0.01). In the difference-in-differences analysis, ICU telemedicine adoption was associated with a small relative reduction in 90-day mortality (ratio of odds ratios=0.96; 95% CI, 0.95-0.98; P<0.001). However, there was wide variation in the ICU telemedicine effect across individual hospitals (median ratio of odds ratios=1.01; interquartile range, 0.85-1.12; range, 0.45-2.54). Only 16 case hospitals (12.2%) experienced statistically significant mortality reductions postadoption. Hospitals with a significant mortality reduction were more likely to have large annual admission volumes (P<0.001) and be located in urban areas (P=0.04) compared with other hospitals.</p> <p>Conclusions: Although ICU telemedicine adoption resulted in a small relative overall mortality reduction, there was heterogeneity in effect across adopting hospitals, with large-volume urban hospitals experiencing the greatest mortality reductions.</p>		
Additional Notes/Comments		

Relevant Literature		
<i>Key words: Intensive care unit, ICU, telemedicine</i>		
Organization	Title	Date
American Journal of Critical Care	Assessing the Impact of Telemedicine on Nursing Care in Intensive Care Unit	1/1/2016
Purpose/Abstract		
<p>Background: Information on the impact of tele-intensive care on nursing and priority areas of nursing care is limited.</p> <p>Objectives: To conduct a national benchmarking survey of nurses working in intensive care telemedicine facilities in the United States.</p> <p>Methods: In a two-phased study, an online survey was used to assess nurses' perceptions of intensive care telemedicine, and a modified two-round Delphi study was used to identify priority areas of nursing.</p> <p>Results: In phase 1, most of the 1213 respondents agreed or strongly agreed that using tele-intensive care enables them to accomplish tasks more quickly (63%), improves collaboration (65.9%), improves job performance (63.6%) and communication (60.4%), is useful in nursing assessments (60%), and improves care by providing more time for patient care (45.6%). Benefits of tele-intensive care included ability to detect trends in vital signs, detect unstable physiological status, provide medical management, and enhance patient safety. Barriers included technical problems (audio and video), interruptions in care, perceptions of telemedicine as an interference, and attitudes of staff. In phase two, 60 nurses ranked 15 priority areas of care, including critical thinking skills, intensive care experience, skillful communication, mutual respect, and management of emergency patient care.</p> <p>Conclusions: The findings can be used to further inform the development of competencies for tele-intensive care nursing, match the tele-intensive care nursing practice guidelines of the American Association of Critical-Care Nurses, and highlight concepts related to the Association's standards for establishing and sustaining healthy work environments.</p>		
Additional Notes/Comments		

Relevant Literature		
Key words: Telemedicine, Medicare, intensive care		
Organization	Title	Date
Critical Care Medicine	Critical care telemedicine: evolution and state of the art	11/1/2014
Purpose/Abstract		
<p>Objectives: To review the growth and current penetration of ICU telemedicine programs, association with outcomes, studies of their impact on medical education, association with medico-legal risks, identify program revenue sources and costs, regulatory aspects, and the ICU telemedicine research agenda.</p> <p>Data Sources: Review of the published medical literature, governmental documents, and opinions of experts from the Society of Critical Care Medicine ICU Telemedicine Committee.</p> <p>Data Synthesis: Formal ICU telemedicine programs now support 11% of nonfederal hospital critically ill adult patients. There is increasingly robust evidence of association of telemedicine program use with lower ICU (0.79; 95% CI, 0.65-0.96) and hospital mortality (0.83; 95% CI, 0.73-0.94) and shorter ICU (-0.62 d; 95% CI, -1.21 to -0.04 d) and hospital (-1.26 d; 95% CI, -2.49 to -0.03 d) lengths of stay. Physicians in training report experiences with telemedicine intensivists that are positive and increased patient safety. Early studies suggest that implementation of ICU telemedicine programs has been associated with lower numbers of malpractice claims and costs. The requirements for Medicare reimbursement and states with legislation addressing providing professional services by telemedicine are detailed in this article.</p> <p>Conclusions: The inclusion of an ICU telemedicine program as a major part of their critical care delivery paradigm has been implemented for 11% of critically ill U.S. adults as a solution for the problem of access to adult critical care services. Implementation of an ICU telemedicine program is one practical way to increase access and reduce mortality as well as length of stay. ICU telemedicine research including comparative effectiveness studies are needed.</p>		
Additional Notes/Comments		
<p>Lilly, C. M., Zubrow, M. T., Kempner, K. M., Reynolds, H. N., Subramanian, S., Eriksson, E. A., ... Kopec, I. C. (2014). Critical Care Telemedicine: Evolution and State of the Art*. <i>Critical Care Medicine</i>, 42(11), 2429–2436. https://doi.org/10.1097/CCM.0000000000000539</p>		

Relevant Literature		
Key words: <i>Telemedicine, Medicare, intensive care</i>		
Organization	Title	Date
Critical Care Medicine	Adoption of ICU telemedicine in the United States	2/1/2014
Purpose/Abstract		
<p>Objective: ICU telemedicine is a novel approach for providing critical care services from a distance. The authors sought to study the extent of use and patterns of adoption of this technology in U.S. ICUs.</p> <p>Design: Retrospective study combining a systematic listing of ICU telemedicine installations with hospital characteristic data from the Centers for Medicare and Medicaid Services. The authors examined adoption over time and compared hospital characteristics between facilities that have adopted ICU telemedicine and those that have not.</p> <p>Setting: U.S. ICUs. U.S. hospitals from 2002 to 2010.</p> <p>Measurements and Main Results: The number of hospitals in the U.S. using ICU telemedicine increased from 16 (0.4% of total hospitals) to 213 (4.6% of total hospitals) between 2003 and 2010. The number of ICU beds covered by telemedicine increased from 598 (0.9% of total beds) to 5,799 (7.9% of total beds). The average annual rate of ICU bed coverage growth was 101% per year in the first four study years but slowed to 8.1% per year over the last four study years ($p < 0.001$ for difference in linear trend). Compared with non-adopting hospitals, hospitals adopting ICU telemedicine were more likely to be large (percentage with > 400 beds: 11.1% vs 3.7%, $p < 0.001$), teaching (percentage with resident coverage: 31.4% vs 21.9%, $p = 0.003$), and urban (percentage located in metropolitan statistical areas with more than 1 million residents: 45.3% vs 30.1%, $p < 0.001$).</p> <p>Conclusions: ICU telemedicine adoption was initially rapid but recently slowed. Efforts are needed to uncover the barriers to future growth, particularly regarding the optimal strategy for using this technology most effectively and efficiently.</p>		
Additional Notes/Comments		

Section 3. Related Literature

Related Literature		
<i>Key words: Geriatric Telemedicine</i>		
Organization	Title	Date
Journal of Medical Systems	The Development of a Telemedicine Planning Framework Based on Needs Assessment	3/20/2017
Purpose/Abstract		
<p>Background: Providing equitable access to healthcare services in rural and remote communities is an ongoing challenge that faces most governments. By increasing access to specialty care, telemedicine may be a potential solution to this problem. Regardless of its potential, many telemedicine initiatives do not progress beyond the research phase, and are not implemented into mainstream practice. One reason may be that some telemedicine services are developed without the appropriate planning to ascertain community needs and clinical requirements.</p> <p>Objective: Report the development of a planning framework for telemedicine services based on a needs assessment.</p> <p>Methods: Authors adopted the key processes of needs assessment, Penchansky and Thomas' dimensions of access and Bradshaw's types of needs to the develop a framework to assess community needs and evaluate the appropriateness of telemedicine.</p> <p>Results: The proposed planning framework consists of two phases. Phase one comprises data collection and needs assessment, and includes assessment of availability and expressed needs; accessibility; perception and affordability. Phase two involves prioritizing the demand for health services, balanced against the known limitations of supply, and the implementation of an appropriate telemedicine service that reflects and meets the needs of the community. Using a structured framework for the planning of telemedicine services, based on needs assessment, may help with the identification and prioritization of community health needs.</p>		
Additional Notes/Comments		
<p>AlDossary, S., Martin-Khan, M. G., Bradford, N. K., Armfield, N. R., & Smith, A. C. (2017). The Development of a Telemedicine Planning Framework Based on Needs Assessment. <i>Journal of Medical Systems</i>, 41(5). https://doi.org/10.1007/s10916-017-0709-4</p>		

Related Literature		
Key words: Geriatric telemedicine		
Organization	Title	Date
International Journal of Medical Informatics	A systematic review of the methodologies used to evaluate telemedicine service initiatives in hospital facilities	1/1/2017
Purpose/Abstract		
<p>Background: The adoption of telemedicine into mainstream health services has been slower than expected. Many telemedicine projects tend not to progress beyond the trial phase; there are a large number of pilot or project publications and fewer ‘service’ publications. This issue has been noted since 1999 and continues to be acknowledged in the literature. While overall telemedicine uptake has been slow, some services have been successful. The reporting and evaluation of these successful services may help to improve future uptake and sustainability. The aim of this literature review was to identify peer-reviewed publications of deployed telemedicine services in hospital facilities; and to report, and appraise, the methodology used to evaluate these services.</p> <p>Methods: Computerized literature searches of bibliographic databases were performed using the MeSH terms for “Telemedicine” and “Hospital Services” or “Hospital”, for papers published up to May 2016.</p> <p>Results: A total of 164 papers were identified, representing 137 telemedicine services. The majority of reported telemedicine services were based in the United States of America (n = 61, 44.5%). Almost two thirds of the services (n = 86, 62.7%) were delivered by real time telemedicine. Of the reviewed studies, almost half (n = 81, 49.3%) assessed their services from three different evaluation perspectives: clinical outcomes, economics and satisfaction. While the remaining half (n = 83, 50.6%) described their service and its activities without reporting any evaluation measures. Only 30 (18.2%) studies indicated a two-step implementation and evaluation process. There was limited information in all reported studies regarding description of a structured planning strategy.</p> <p>Conclusion: Our systematic review identified only 137 telemedicine services. This suggests either telemedicine service implementation is still not a part of mainstream clinical services, or it is not being reported in the peer-reviewed literature. The depth and the quality of information were variable across studies, reducing the generalizability. The reporting of service implementation and planning strategies should be encouraged. Given the fast-paced technology-driven environment of telemedicine, this may enable others to learn and understand how to implement sustainable services. The key component of planning was underreported in these studies. Studies applying and reporting more rigorous methodology would contribute greatly to the evidence for telemedicine.</p>		
Additional Notes/Comments		
AlDossary, S., Martin-Khan, M. G., Bradford, N. K., & Smith, A. C. (2017). A systematic review of the methodologies used to evaluate telemedicine service initiatives in hospital facilities. <i>International Journal of Medical Informatics</i> , 97, 171–194. https://doi.org/10.1016/j.ijmedinf.2016.10.012		

Related Literature		
Key words: Telemedicine, Medicare		
Organization	Title	Date
Journal of the American Medical Directors Association	Implementation of Telemedicine Consultation to Assess Unplanned Transfers in Rural Long-Term Care Facilities, 2012-2015: A Pilot Study	11/1/2016
Purpose/Abstract		
<p>Introduction: Public and private entities in the United States spend billions of dollars each year on potentially avoidable hospitalizations. This is a common occurrence in long-term care (LTC) facilities, especially in rural jurisdictions. This article details the creation of a telemedicine approach to assess residents from rural LTC facilities for potential transfer to hospitals.</p> <p>Methods: An electronic LTC (eLTC) pilot was conducted in 20 pilot LTC facilities from 2012-2015. Each site underwent technologic assessment and upgrading to ensure that two-way video communication was possible. A new central "hub" was staffed with advanced practice providers and registered nurses. Long-term care pilot sites were trained and rolled out over 3 years. This article reports development and implementation of the pilot, as well as descriptive statistics associated with provider assessments and averted transfers.</p> <p>Results: Over 3 years, 736 eLTC consultations occurred in pilot sites. One-quarter of consultations occurred between 10 pm and 9 am. Overall, approximately 31% of cases were transferred to emergency departments and hospitalizations. This decreased from 54% of cases in 2013 to 17% in 2015. Rural pilot facilities had an average of 23 eLTC consults per site per year.</p> <p>Discussion: Averted transfers represent a dramatic benefit to LTC residents, as potentially avoidable hospitalizations cause undue stress and allow for nosocomial infections, among other risks. In addition, averting these unnecessary transfers likely saved U.S. taxpayers over \$5 million in admission-related charges to Centers for Medicare and Medicaid Services (511 avoided transfers × \$11,000 per average hospitalization from a LTC facility).</p> <p>Conclusions: Overall, the eLTC pilot showed promise as a proof-of-concept. The pilot's implementation resulted in increasing utilization and promising reductions in unnecessary transfers to emergency departments and hospitalizations.</p>		
Additional Notes/Comments		

Avera Health and NFI Comparison Tables
Social & Scientific Systems, Inc.
January 19, 2018

The table below (Table 1) illustrates an overall comparison of the two models and details various components of each program. The table below highlights similarities and differences between the models and is organized across seven components: (1) beneficiary eligibility; (2) care delivery requirements; (3) team composition; (4) length of episode; (5) payment methodology; (6) risk mitigation; and (7) shared savings approach and incentive payments.

In addition, a comparison between quality measures across the Avera Health Proposal and NFI Initiative (Phase 1) is presented in Table 2.

TABLE 1. Comparison between the Avera Health Proposal and the Initiative to Reduce Avoidable Hospitalizations Among Nursing Facility Residents			
	Avera Health Proposal	Initiative to Reduce Avoidable Hospitalizations Among Nursing Facility Residents (Phase I)	Initiative to Reduce Avoidable Hospitalizations Among Nursing Facility Residents (Phase II)
Beneficiary eligibility	Beneficiaries eligible would include traditional Medicare beneficiaries under a Part A qualifying post-acute or short stay, as well as individuals considered long-stay or under custodial care. The Model is aimed at supporting geriatricians serving such beneficiaries who reside at nursing facilities, including Long Term Care (LTC), Skilled Nursing Facilities (SNF), and Nursing Facilities (NF).	The Intervention targets long-stay Medicare- Medicaid enrollees in Medicare-Medicaid certified nursing facilities, rather than those encountering short-stay issues. Beneficiaries would include more than 17,000 long-stay beneficiaries in the partnering facilities within the first year, and thousands of additional beneficiaries over the four years of the Initiative.	Same as Phase I, 6 ECCP organizations and 249 NF partner organizations engaged in Phase II. Phase II of the Initiative is aimed at supporting payment reform in both nursing facilities where an ECCP intervention has not been implemented as well as nursing facilities where a previous ECCP has been implemented through the initial phase I. CMS anticipates Group A and Group B to each contain at least 120 nursing facilities, over 300 practitioners, and an average daily census of more than 10,500 beneficiaries.
Provider and Care Delivery Requirements	The Model will be available for the 7,293 board-certified and eligible geriatricians and their teams, residing in or providing care for 15,600 U.S. nursing facilities. The care delivery model would be implemented across an entire nursing facility, rather than	Each participant was required to partner with a minimum of 15 Medicare-Medicaid certified nursing facilities in the same State where the intervention will be implemented.	Each participating LTC is required to provide intensive, acute care on site at the LTC for the 6 conditions including that contribute to potentially avoidable hospitalizations including: COPD/asthma, pneumonia, urinary

TABLE 1. Comparison between the Avera Health Proposal and the Initiative to Reduce Avoidable Hospitalizations Among Nursing Facility Residents

	Avera Health Proposal	Initiative to Reduce Avoidable Hospitalizations Among Nursing Facility Residents (Phase I)	Initiative to Reduce Avoidable Hospitalizations Among Nursing Facility Residents (Phase II)
	<p>select groups of residents, and participants would need to carry out the following Intensive Care Management activities and provide the following services across their beneficiary population:</p> <ul style="list-style-type: none"> • A geriatric care management team, led by a Geriatrician and providing multidisciplinary monitoring of a resident’s care during their stay, in close collaboration with their attending PCP. • Risk stratification of patient population. • Development of care plans for high risk residents. • Medication management in coordination with the PCP. • Evidence-based disease management • Behavioral health support, including addressing medications, behaviors, and crises. • Advanced care planning and transitional care support from hospital to nursing facility, as well as transitional care follow-up after discharge. • Medication reconciliation. • 24/7 access to care via telemedicine to a physician or Advance Practice 	<p>Although the Initiative did not prescribe a specific clinical model for these interventions, all proposed interventions must have included the following:</p> <ul style="list-style-type: none"> • Improve beneficiary safety by coordinating management of prescription drugs to reduce risk of adverse drug events for residents. • Bring onsite staff to collaborate and coordinate with existing providers, including residents’ PCP and nursing facility staff. • Demonstrate a strong evidence base for the proposed intervention and potential for replication and sustainability in other communities. • Supplement existing care provided by nursing facility staff, rather than replace it. • Allow for participation by nursing facility residents without any need for residents or their families to change providers or enroll in a health plan. 	<p>tract infection, congestive heart failure, ulcers/ cellulitis, and dehydration. ECCPs are responsible for recruiting and screening new providers for participation and ensuring that all providers meet readiness standards before receiving any new Medicare funding.</p> <p>Under phase II, proposed interventions must implement the payment model in a way which:</p> <ul style="list-style-type: none"> • Reduces the frequency of avoidable hospital admissions and readmissions. • Improves resident health outcomes. • Improves the process of transitioning between inpatient hospitals and LTC facilities. • Reduces overall health care spending without restricting access to care or choice of providers.

TABLE 1. Comparison between the Avera Health Proposal and the Initiative to Reduce Avoidable Hospitalizations Among Nursing Facility Residents

	Avera Health Proposal	Initiative to Reduce Avoidable Hospitalizations Among Nursing Facility Residents (Phase I)	Initiative to Reduce Avoidable Hospitalizations Among Nursing Facility Residents (Phase II)
	<p>Provider (APP) who has real-time access to resident’s medical records.</p> <ul style="list-style-type: none"> • Real-time provider response to changes in resident’s health status. <p>In addition, Model Participation Criteria incorporates strategies addressing the following concerns:</p> <ul style="list-style-type: none"> • PCP Care Coordination and Assessment of Satisfaction. • Nursing home engagement and measurement of staff satisfaction. • Assessment of beneficiary satisfaction. • Use of appropriate HIT to coordinate care between GCT and nursing home care team (including telemedicine access). • Nursing home staff coaching and mentorship. • Continuing Education Credits (CEC) targeted at knowledge and skill gaps. • Use of data in continuous quality improvement. 		
Team composition	<p>The Geriatric Care Team (GCT) would be required to be led by a Geriatrician, as well as include a multidisciplinary collection of RNs, social workers, and pharmacist working closely in collaboration with the resident’s attending PCP. The geriatrician</p>	<p>ECCPs were required to employ registered nurses (RNs) or advanced practice registered nurses (APRNs), full or part time, to support partnering facilities. APRNs are defined in federal statute as NPs, clinical nurse specialists</p>	<p>Same as Phase I</p>

TABLE 1. Comparison between the Avera Health Proposal and the Initiative to Reduce Avoidable Hospitalizations Among Nursing Facility Residents

	Avera Health Proposal	Initiative to Reduce Avoidable Hospitalizations Among Nursing Facility Residents (Phase I)	Initiative to Reduce Avoidable Hospitalizations Among Nursing Facility Residents (Phase II)
	would be expected to support the PCP by providing access to an immediate-response team in addressing episodic, emergent issues, and off-hours events. The team should consist of multiple clinical disciplines in order to effectively manage the whole health of the patient.	(CNSs), certified registered nurse anesthetists (CRNAs), and certified nurse midwives (CNMs). Such RNs should possess advanced educations (Master’s degree/Doctorate of Nursing Practice) and clinical training to provide health care services, with an emphasis on the health and well-being of the whole person. Specific roles and responsibilities were guided by the individual models, as well as state and federal regulations governing scope of practice and CPAs, with communication with PCPs as needed.	
Length of episode	Patients would be part of the care model until opting out from the GCT.	Enrollment in many of the state initiatives was automatic, as residents were enrolled unless they explicitly opted out; believing that access to another clinician would be beneficial, very few residents opted out and there was minimal disenrollment.	Same as Phase I
Payment methodology	This Model recommends two options for payment, from which PTAC would (as proposed) choose the best-fit for its alternative definition. 1. Performance-Based Payment, paid throughout the year and potentially adjusted in subsequent years depending on quality of performance. This approach is simplified and	As part of the objective to utilize quality measurements to promote quality, the SNF Value-Based Purchasing (VBP) Program rewards SNFs for high-quality care of Medicare residents by creating incentives for reducing unplanned hospital readmissions. The SNF VBP will redistribute a portion of SNF Medicare payments based on performance in the program beginning October 1, 2018.	The model includes payments to LTC facilities for providing acute care on-site and payments to practitioners (i.e., physicians, nurse practitioners and physician assistants) at levels similar to the payments they would receive for treating beneficiaries in a hospital. Practitioners would also be eligible to receive new payments for engagement in multidisciplinary care planning activities.

TABLE 1. Comparison between the Avera Health Proposal and the Initiative to Reduce Avoidable Hospitalizations Among Nursing Facility Residents

	Avera Health Proposal	Initiative to Reduce Avoidable Hospitalizations Among Nursing Facility Residents (Phase I)	Initiative to Reduce Avoidable Hospitalizations Among Nursing Facility Residents (Phase II)
	<p>encourages broader participation, which is preferred.</p> <p>2. Shared Savings Model, providing the same monthly payment for services delivered, including an annual financial reconciliation to determine if savings were generated. If additional shared savings are due to Participants these would be assessed as well. The Shared Model incorporates participant engagement by shifting the risk to the provider, achieving potentially more significant cost savings.</p> <p>The underlying payment methodology for the model is based on a two-tier regular payment: A one-time payment of \$252 for new admission care and an ongoing monthly payment of \$55 for post-admission care. Payments will be billed to Medicare through the GCT lead’s NPI number. Regular payments will depend on the participant’s ability to meet performance criteria for specified and accepted quality and financial metrics.</p>		
Risk Mitigation	Of the two models, the Performance-Based Payment option does not require risk-adjusted payments. Many of the system and performance improvement efforts apply regardless of risk.		Unspecified

TABLE 1. Comparison between the Avera Health Proposal and the Initiative to Reduce Avoidable Hospitalizations Among Nursing Facility Residents

	Avera Health Proposal	Initiative to Reduce Avoidable Hospitalizations Among Nursing Facility Residents (Phase I)	Initiative to Reduce Avoidable Hospitalizations Among Nursing Facility Residents (Phase II)
	The Shared Savings Model uses the CMS Hierarchical Condition Category (HCC) risk score to adjust the target bundle price to reflect underlying risk of the beneficiary population.		
Shared Savings Approach & Incentive Payments	<p>The Model provides clear financial incentives for geriatricians to provide holistic population health care for residents of nursing facilities by rewarding geriatrician teams that partner with nursing facilities towards proactive and intensive care management.</p> <p>Regular Payment is contingent on meeting the outcome and quality performance criteria listed in this proposal, aligning the geriatrician’s incentives with the goals of CMS, and structured with less risk to the geriatricians during preliminary years of the program. This provides time for the participants to fully implement their care models and allows inclusion of more risk-adverse practices, offering a two-year buffer period before accepting reimbursement risk.</p>	In supporting nursing facilities that provide clinical care and education, end-of-life care planning, medication management, and other ECCP-specific interventions, more timely changes in resident treatment plans are possible. Improved care processes and provider communication allow facilities to provide higher quality care to residents and avoid unnecessary hospitalizations, which improves residents’ quality of life and provides savings for Medicare.	Practitioners would also be eligible to receive new payments for engagement in multidisciplinary care planning activities.

TABLE 2: Quality Measures Comparison

Avera Health Proposal	Initiative to Reduce Avoidable Hospitalizations Among Nursing Facility Residents (Phase I)	Initiative to Reduce Avoidable Hospitalizations Among Nursing Facility Residents (Phase II)
<p>The Model includes several metrics, which quantitatively evaluate its efficacy based on processes of care, health outcomes, and cost. The Model is also designed to be benchmarked against the LTC population and to mark improvements over time.</p> <p>Building on lessons learned from the pilot study, value added by the proposal will be measured across 11 outcome and quality metrics, including:</p> <ol style="list-style-type: none"> 1. Health Outcome and Cost Management (2) 2. Short Stay Scored Quality Metrics (3) 3. Long Stay Scored Quality Metrics (6) <p>In addition, performance will be measured along 13 other monitored quality metrics, of which more than five must meet the targeted goal.</p> <p>The quality and outcome goals can be evaluated for the population of residents at any one facility, and will rely on CMS standard data gathering and reporting procedures.</p> <p>There are currently no evaluations of the proposed Model, although a formal evaluation of the Avera eLTC project is under way.</p>	<p>The Initiative involved seven Enhanced Care and Coordination Providers (ECCPs), created for the Initiative, each seeking to improve health quality with a focus on reducing avoidable hospitalizations. Unique models were developed to support each participating nursing facility within each state. The impact of each ECCP intervention was estimated on selected individual-level measures including hospitalizations, potentially avoidable hospitalizations, and related expenditures, broadly categorized A:</p> <ol style="list-style-type: none"> 1. Service Utilization 2. Program Expenditures 3. Medicare Expenditures by Category 4. MDS-based Quality Measures <p>The measures were defined on an annual basis, with calendar years used for all years except for 2016, for which a fiscal year (October 1, 2015–September 30, 2016) was used because a new phase of the Initiative, including incentive payments to providers (Payment Reform Initiative), started on October 1, 2016.</p> <p>A number of qualitative design measures were also implemented to complement the quantitative measures gathered, including formal site visits and telephone interviews to provide details regarding facility and leadership engagement and Initiative implementation progress. Annual surveys were used to track facility administrators’ perceptions of progress, successes, and challenges as well, provided context to the quantitative measures.</p>	<p>Costs/Medicare spending Hospitalizations/rates</p>

TABLE 2: Quality Measures Comparison

Avera Health Proposal		Initiative to Reduce Avoidable Hospitalizations Among Nursing Facility Residents (Phase I)		Initiative to Reduce Avoidable Hospitalizations Among Nursing Facility Residents (Phase II)
Health Outcome and Cost Management	<p>Participants were measured on the following two dimensions:</p> <ul style="list-style-type: none"> • Percent of short-stay residents who have had an outpatient emergency department visit. • SNF 30-day All Cause Readmission measure <p>The performance criteria was to be within the top two quintiles or else to improve by 5 percent annually.</p>	Service Utilization	<p>Participants were measured on the following eight dimensions, both whether a given resident had an admission or visit of the specified type, as well as the total count of all admissions and visits of the specified types:</p> <ul style="list-style-type: none"> • Whether a resident had an inpatient admission. • Total count of inpatient admissions. • Whether a resident had an inpatient admission for any of the conditions defined as potentially avoidable. • Total count of inpatient admissions for any of the conditions defined as potentially avoidable. This measure is a subset of Hospitalization, all cause • Whether a resident had an outpatient ED visit that did not lead to inpatient admission, identified as RCC = (045X or 0981) or HCPCS classification code = (99281-99285). • Total count of outpatient ED visits that did not lead to inpatient admission, identified as RCC = (045X or 0981) or HCPCS classification code = (99281-99285). • Whether a resident had an outpatient ED visit (as identified above) for any of the same conditions used to define potentially avoidable hospitalizations. 	

TABLE 2: Quality Measures Comparison

Avera Health Proposal		Initiative to Reduce Avoidable Hospitalizations Among Nursing Facility Residents (Phase I)		Initiative to Reduce Avoidable Hospitalizations Among Nursing Facility Residents (Phase II)
			<ul style="list-style-type: none"> Total count of outpatient ED visits (as identified above) for any of the same conditions as used to define potentially avoidable hospitalizations. 	
Short Stay Scored Quality Metrics	<p>Participants were measured on the following three dimensions:</p> <ul style="list-style-type: none"> Percent of short-stay residents assessed and appropriately given seasonal influenza vaccine. Percent of short-stay residents assessed and appropriately given pneumococcal vaccine. Percent of short-stay residents newly administered antipsychotic medication. <p>The performance criteria was to be above the 50th percentile or else to improve toward the 50th percentile by 5 percentile points annually.</p>	Program Expenditures	<p>Participants were measured on the following two dimensions:</p> <ul style="list-style-type: none"> Total Medicaid expenditure per beneficiary for long-stay nursing facility care and Medicaid cost sharing of Medicare expenditures for all covered services. Total Medicare expenditure per beneficiary for all covered services, including inpatient, outpatient, SNF, carrier file services, hospice, home health, durable medical equipment, and prescription drugs. 	
Long Stay Scored Quality Metrics	<p>Participants were measured on the following six dimensions:</p> <ul style="list-style-type: none"> Percent of long-stay residents with a urinary tract infection. Percent of long-stay residents who are administered antipsychotic medications. Percent of long-stay residents who have depressive symptoms. 	Medicare Expenditures by Category	<p>Participants were measured on the following four dimensions:</p> <ul style="list-style-type: none"> Total Medicare expenditure per beneficiary for all-cause inpatient admissions. Total Medicare expenditure per beneficiary for inpatient admissions for any of the conditions defined as potentially avoidable. 	

TABLE 2: Quality Measures Comparison

Avera Health Proposal		Initiative to Reduce Avoidable Hospitalizations Among Nursing Facility Residents (Phase I)		Initiative to Reduce Avoidable Hospitalizations Among Nursing Facility Residents (Phase II)
	<ul style="list-style-type: none"> • Percent of long-stay residents who received an antianxiety or hypnotic medication. • Percent of long-stay residents assessed and appropriately given seasonal influenza vaccine. • Percent of long-stay residents assessed and appropriately given pneumococcal vaccine. <p>The performance criteria was to be above the 50th percentile or else to improve toward the 50th percentile by 5 percentile points annually.</p>		<ul style="list-style-type: none"> • Total Medicare expenditure per beneficiary for all-cause ED visits that did not lead to inpatient admission, identified as RCC = (045X or 0981) or HCPCS classification code = (99281-99285) • Total Medicare expenditure per beneficiary for ED visits (as identified above) for any of the same conditions as used to define potentially avoidable hospitalizations. 	
Monitored Performance Quality Metrics	<p>Participants were measured on the following 13 dimensions, chosen based on their widespread acceptance and use in federal reporting programs:</p> <ul style="list-style-type: none"> • Percent of short-stay residents who made improvements in function. • Percent of short-stay residents who were successfully discharged to the community. • Percent of short-stay residents who self-report moderate to severe pain. • Percent of short-stay residents who have pressure ulcers that are new or worsened. 	MDS-based Quality Measures	<p>Participants were measured on the following eight dimensions:</p> <ul style="list-style-type: none"> • Percent of observed quarters in a year indicating presence of indwelling catheters. • Percent of observed quarters in a year indicating that a resident received an antipsychotic medication. • Percent of observed quarters in a year indicating presence of one or more falls that resulted in injury. • Percent of observed quarters in a year indicating presence of either (1) almost constant or frequent moderate to severe pain or (2) any very severe/horrible pain. 	

TABLE 2: Quality Measures Comparison

Avera Health Proposal		Initiative to Reduce Avoidable Hospitalizations Among Nursing Facility Residents (Phase I)		Initiative to Reduce Avoidable Hospitalizations Among Nursing Facility Residents (Phase II)
	<ul style="list-style-type: none"> • Percent of long-stay residents whose ability to move independently worsened. • Percent of long-stay residents whose need for help with daily activities has increased. • Percent of long-stay high- risk residents with pressure ulcers. • Percent of long-stay residents who have/had a catheter inserted and left in their bladder. • Percent of long-stay residents who were physically restrained. • Percent of long-stay residents who self-report moderate to severe pain. • Percent of long-stay residents experiencing one or more falls with major injury. • Percent of long-stay low- risk residents who lose control of their bowels or bladder. • Percent of long-stay residents who lose too much weight. <p>The performance criteria was to be above the 50th percentile or else to not decrease by more than 5 percentile points annually in more than five of the quality measures.</p>		<ul style="list-style-type: none"> • Percent of observed quarters in a year indicating presence of Stage II–IV pressure ulcers. • Percent of observed quarters in a year indicating that a resident’s need for help with late-loss ADLs has increased. An increase is defined as an increase in 2 or more coding points in one late-loss ADL item or 1-point increase in coding points in two or more late loss ADL items. • Percent of observed quarters in a year indicating presence of urinary tract infection. • Percent of observed quarters in a year indicating presence of depressive symptoms measured by PHQ-9 or PHQ-9-OV. 	

Emergency Department and Hospital Utilization in Long-term Care Facilities: Annotated Bibliography

PURPOSE

The Preliminary Review Team (PRT) reviewing the *Intensive Care Management in Skilled Nursing Facility Alternative Payment Model (ICM SNF APM)* proposal submitted by Avera Health is interested in understanding the patterns and trends of emergency department (ED) visits and hospitalizations for Medicare beneficiaries who reside in skilled nursing facilities (SNFs) and nursing facilities (NFs). Staff in the Office of the Assistant Secretary for Planning and Evaluation (ASPE) worked with Social & Scientific Systems, Inc. (SSS) to produce this annotated bibliography, which supplements data tables produced by SSS.

The literature search strategy used the search features of Google Scholar, PubMed, and other relevant sources, including CMS.gov, and selected journals including *Health Affairs* and the *New England Journal of Medicine*. The keywords below were used to search the peer-reviewed and grey literature. When an on-topic article or review was found, the related articles feature and recent article citations and references for additional articles and reports were explored. The search was limited to the last five years, except where no relevant research was found within that time period; then, older articles (within the last 10-15 years) were also examined.

Keywords used in this search include: acute care, assisted living, beneficiaries, Dual Eligibles, ED visits, elder[ly], emergency, emergency department, hospital, hospitalizations, innovation, long-term care, long term care (LTC) facilities, nursing facilities, nursing home[s], potentially avoidable hospitalizations (PAH), Medicaid, Medicare, readmissions, skilled nursing facility (SNF), telemedicine, transfer, and US.

The citations are loosely organized into the following categories:

- Emergency Department Utilization
- Hospital Utilization
- Telemedicine/Interventions
- Dual-Eligible Patients

EMERGENCY DEPARTMENT UTILIZATION

Emergency Department Use by Nursing Home Residents

Ackermann, R. J., Kemle, K. A., Vogel, R. L., & Griffin, R. C. (1998). Emergency Department Use by Nursing Home Residents. *Annals of Emergency Medicine, 31*(6), 749–757.

Abstract

Study objective: To describe a community's experience with the use of emergency department services by nursing home residents.

Methods: We performed a retrospective chart review of a population-based cohort of nursing home residents in an urban county in central Georgia with 10 nursing homes (1,300 beds) and 4 hospital-based EDs. All ED visits by nursing home residents during 1995 were analyzed. Demographic data, timing of the visit, chief complaint, tests and treatments, disposition, and financial charges were recorded. Further, we calculated the number of ED visits per 100 nursing home patient-years.

Results: A total of 873 nursing home residents made 1,488 ED visits. Mean age was 76.0 years; 66.4% were female, and 55.2% were white. Of the transfers, 42.9% occurred during regular working hours. The most common chief complaints were respiratory symptoms (14.4%), altered mental status (10.1%), gastrointestinal symptoms (9.9%), and falls (8.2%); 101 patients (6.8%) were transferred for malfunction of a gastrostomy tube. The most common laboratory tests were complete blood cell count (69.5%), chest radiograph (52.0%), electrocardiogram (45.0%), urinalysis (42.7%), and determination of electrolytes (42.7%). A total of 42.4% of the ED visits led to admission to the hospital. From the 10 nursing homes, there were 110 ED visits per 100 patient-years. A 3.5-fold difference in ED use among these nursing homes could not be explained by age, gender, or other factors. The average charge per ED visit was \$1,239.

Conclusion: Elders living in nursing homes are frequently transferred to EDs for costly medical evaluations, and more than 40% of such visits lead to admission to the hospital.

Additional Information

- The older study was the only source we identified that examined use of ED by nursing home residents by time of week and day. The study reported that more than 40% of all transfers occurred during regular weekday working hours.
- There was no finding of an overuse of ED services on the weekends, which may indicate that the presence of a nursing home physician might not be a factor in the rate of transfers.
- However, this study is 20 years old so it is unclear if the findings remain accurate for ED use today.

Emergency Department Visits and Resulting Hospitalizations by Elderly Nursing Home Residents, 2001-2008

Hsiao, C.J., & Hing, E. (2014). Emergency Department Visits and Resulting Hospitalizations by Elderly Nursing Home Residents, 2001–2008. *Research on Aging, 36*(2), 207–227.
<https://doi.org/10.1177/0164027512473488>

Abstract

This study examines emergency department (ED) visits by nursing home (NH) residents aged 65 and over, and factors associated with hospital admission from the ED visit using data from the 2001–2008 National Hospital Ambulatory Medical Care Survey. Cross-sectional analyses were conducted on patient characteristics, diagnosis, procedures received, and triage status. On average, elderly NH residents visited EDs at a rate of 123 visits per 100 institutionalized persons. Nearly 15% of all ED visits had ambulatory care sensitive condition diagnoses. Nearly half of these visits resulted in hospital admission; chronic obstructive pulmonary disease, congestive heart failure, kidney/urinary tract infection, and dehydration were associated with higher odds of admission. Previous studies suggested that adequate medical staffing and appropriate care in the NH could reduce ED visits and hospital admissions. Recent initiatives seek to reduce ED visits and hospitalizations by providing financial incentives to spur better coordination between NH and hospital.

Additional Information

- Nursing home residents in the survey aged 65 or older visited the ED for a total of 4,970 times during 2001-2008 which is the equivalent of 2.0 million ED visits annually. Nearly 15% of all ED visits had ambulatory care sensitive condition diagnoses.
- While hospitalization rate has declined, there was a slight increase in annual rate of ED visits from NH residents. There was an increase from 111.1 visits/100 residents between 2001 and 2004 to 128.3 visits/100 residents between 2005 and 2008.

Patterns of Emergency Department Use Among Long-Stay Nursing Home Residents with Differing Levels of Dementia Severity

LaMantia, M. A., Lane, K. A., Tu, W., Carnahan, J. L., Messina, F., & Unroe, K. T. (2016). Patterns of Emergency Department Use Among Long-Stay Nursing Home Residents With Differing Levels of Dementia Severity. *Journal of the American Medical Directors Association, 17*(6), 541–546. <https://doi.org/10.1016/j.jamda.2016.02.011>

Abstract

Objectives: To describe emergency department (ED) utilization among long-stay nursing home residents with different levels of dementia severity.

Design: Retrospective cohort study.

Setting: Public Health System.

Participants: A total of 4491 older adults (age 65 years and older) who were long-stay nursing home residents.

Measurements: Patient demographics, dementia severity, comorbidities, ED visits, ED disposition decisions, and discharge diagnoses.

Results: Forty-seven percent of all long-stay nursing home residents experienced at least 1 transfer to the ED over the course of a year. At their first ED transfer, 36.4% of the participants were admitted to the hospital, whereas 63.1% of those who visited the ED were not. The median time to first ED visit for the participants with advanced stage dementia was 258 days, whereas it was 250 days for the participants with early to moderate stage dementia and 202 days for the participants with no dementia ($P = .0034$).

Multivariate proportional hazard modeling showed that age, race, number of comorbidities, number of hospitalizations in the year prior, and do not resuscitate status all significantly influenced participants' time to first ED visit ($P < .05$ for all). After accounting for these effects, dementia severity ($P = .66$), years in nursing home before qualification ($P = .46$), and gender ($P = .36$) lost their significance.

Conclusions: This study confirms high rates of transfer of long-stay nursing home residents, with nearly one-half of the participants experiencing at least 1 ED visit over the course of a year. Although dementia severity is not a predictor of time to ED use in our analyses, other factors that influence ED use are readily identifiable. Nursing home providers should be aware of these factors when developing strategies that meet patient care goals and avoid transfer from the nursing home to the ED.

Additional Information

- The study reports an increasing trend of ED visits over time with a rate of 4.0 ED visits per 1,000 nursing home bed days in 2001 to a rate of 5.9 ED visits per 1,000 nursing home bed days in 2008.

Emergency Department Visits by Nursing Home Residents in the United States

Wang, H. E., Shah, M. N., Allman, R. M., & Kilgore, M. (2011). Emergency Department Visits by Nursing Home Residents in the United States. *Journal of the American Geriatrics Society, 59*(10), 1864–1872. <https://doi.org/10.1111/j.1532-5415.2011.03587.x>

Abstract

Background: The Emergency Department (ED) is an important source of health care for nursing home residents. The objective of this study was to characterize ED use by nursing home residents in the United States (US).

Design: Analysis of the National Hospital Ambulatory Medical Care Survey

Setting: US Emergency Departments, 2005-2008

Participants: Individuals visiting US EDs, stratified by nursing home and non-nursing home residents.

Interventions: None

Measurements: We identified all ED visits by nursing home residents. We contrasted the demographic and clinical characteristics between nursing home residents and non-nursing home residents. We also compared ED resource utilization, length of stay and outcomes.

Results: During 2005-2008, nursing home residents accounted for 9,104,735 of 475,077,828 US ED visits (1.9%; 95% CI: 1.8-2.1%). The annualized number of ED visits by nursing home residents was 2,276,184. Most nursing home residents were elderly (mean 76.7 years, 95% CI: 75.8-77.5), female (63.3%), and non-Hispanic White (74.8%). Compared with non-nursing home residents, nursing home residents were more likely have been discharged from the hospital in the prior seven days (adjusted OR 1.4, 95% CI: 1.1-1.9). Nursing home residents were more likely to present with fever (adjusted OR 1.9; 95% CI: 1.5-2.4) or hypotension (systolic blood pressure \leq 90 mm Hg, OR 1.8; 95% CI: 1.5-2.2). Nursing home patients were more likely to receive diagnostic test, imaging and procedures in the ED. Almost half of nursing home residents visiting the ED were admitted to the hospital. Compared with non-nursing home residents, nursing home residents were more likely to be admitted to the hospital (adjusted OR 1.8; 95% CI 1.6-2.1) and to die (adjusted OR 2.3; 95% CI 1.6-3.3).

Conclusions: Nursing home residents account for over 2.2 million ED visits annually in the US. Compared with other ED patients, nursing home residents have higher medical acuity and complexity. These observations highlight the national challenges of organizing and delivering ED care to nursing home residents in the US.

Additional Information

- Nursing home residents were prominent users of the ED, accounting for over 2.2 million ED visits annually.

The most prominent observation was that nursing home residents were more likely than non-nursing home residents to have been discharged from the hospital within the prior seven days

HOSPITAL UTILIZATION

Predictors of Avoidable Hospitalizations among Assisted Living Residents

Becker, M., Boaz, T., Andel, R., & DeMuth, A. (2012). Predictors of Avoidable Hospitalizations Among Assisted Living Residents. *Journal of the American Medical Directors Association*, 13(4), 355–359.

Abstract

Objectives: Hospitalizations for long term care residents, including those from assisted living facilities (ALFs), are very costly, often traumatic, and increase risk for iatrogenic disorders for those involved. Currently, hospital expenditures account for approximately one-third of total national health care spending. Hospitalizations for ambulatory care-sensitive (ACS) conditions are considered potentially avoidable, as these are physical health conditions that can often be treated safely at a lower level of care or occur as a result of lack of timely, adequate treatment at a lower level of care. The goal was to examine risk factors for hospitalization for an ACS condition of Medicaid-enrolled younger and older ALF residents during 2003-2008.

Design: This is a retrospective cohort study that used 5 years of Medicaid enrollment and fee-for-service claims data.

Participants: The study sample included 16,208 Medicaid-enrolled ALF residents in Florida, 7991 (49%) of whom were 65 years of age or older.

Results: In total, study participants had 22,114 hospitalizations, 3759 (17%) of which were for an ACS condition. Sixteen percent of all ALF residents (n = 2587), about 12% of the younger residents and 20% of the older residents, had at least one ACS hospitalization. ACS hospitalizations constitute 13% of all hospitalizations for the younger residents and 22% of all hospitalizations for the older residents. Using Cox proportional hazard regression, we found that for both age groups, increased age, being Hispanic or of other race/ethnicity, and having comorbid physical health conditions were associated with a higher risk of ACS hospitalization. For older residents, having a dementia diagnosis and being African American reduced the risk of ACS hospitalization, whereas for younger residents having a major psychotic disorder reduced the risk of ACS hospitalization.

Conclusion: The results highlight the need for increased education, communication, and future research on these predictive factors. The increased frequency of hospitalization for ACS conditions among ALF residents with minority status and older age may well indicate that their more complex health care needs are not being adequately addressed. The role of serious mental illness and dementia in risk for ACS hospitalization also deserves further attention.

Additional Information

- Among ALF residents (on Medicaid) in Florida, about half of which were 65 and over, there were on average about 1.4 hospitalizations per resident.
- Twenty percent of older residents had at least one avoidable hospitalization.
- Older age, having co-morbid conditions and non-African American ethnicity increased the risk of preventable hospitalizations.

Data Brief: Sharp Reduction in Avoidable Hospitalizations Among Long-Term Care Facility Residents

Brennan, N. & Engelhardt, T. (2017). Data Brief: Sharp Reduction in Avoidable Hospitalizations Among Long-Term Care Facility Residents. *The CMS Blog*. <https://blog.cms.gov/2017/01/17/data-brief-sharp-reduction-in-avoidable-hospitalizations-among-long-term-care-facility-residents/>

Summary

The Centers for Medicare & Medicaid Services (CMS) assessed long-term care facility residents and the rate of avoidable hospitalizations. The article reports 2010- 2015 data for hospitalizations of Medicare FFS and dual eligible beneficiaries, and the types of potentially avoidable conditions responsible for a third of hospitalizations.

Additional Information

- There were 352,000 hospitalizations for Medicare FFS beneficiaries living in long-term care facilities in 2015. Of the 352,000 hospitalizations, dual-eligibles accounted for 270,000 of them.
- There has been a decline in the rate of potentially avoidable hospitalizations (PAHs) for dually-eligible beneficiaries in long-term care facilities from 2010 to 2015. The rate of PAHs in 2010 was 227 per 1,000 beneficiaries and decreased in 2015 to 157 per 1,000 beneficiaries.

Medicare Spending and Use of Medical Services for Beneficiaries in Nursing Homes and Other Long-Term Care Facilities: A Potential for Achieving Medicare Savings and Improving the Quality of Care

Jacobson, G., Neuman, T., & Damico, A. (2010). Medicare Spending and Use of Medical Services for Beneficiaries in Nursing Homes and Other Long-Term Care Facilities: A Potential for Achieving Medicare

Savings and Improving the Quality of Care. *The Henry J. Kaiser Family Foundation*. Retrieved from <https://kaiserfamilyfoundation.files.wordpress.com/2013/01/8109.pdf>

Summary

The report examines Medicare spending and use of Medicare-covered services among beneficiaries living in nursing homes, assisted living facilities, and other long-term care facilities. Data was used from Medicare Current Beneficiary Survey (MCBS) Cost and Use File from 2003 through 2006. Findings show beneficiaries living in long-term care facilities account for a disproportionate share of Medicare spending, with relatively high rates of hospitalizations, emergency room visits, SNF admissions and other Medicare-covered services. The relatively high Medicare spending is incurred not only by long-term care residents who die within the year, or those who transition from another setting into a long-term care facility, but also by beneficiaries living in a facility throughout the calendar year. Studies indicate that 30 to 67 percent of hospitalizations among facility residents could be prevented with well-targeted interventions. Others have identified factors that contribute to preventable hospitalizations, including liability concerns, limited staff capacity, financial incentives, and physician preferences. This analysis illustrates how successful efforts to reduce the rate of preventable hospitalizations could yield savings to Medicare. Such efforts, if carefully implemented, could also help to improve the quality of patient care for Medicare's oldest and most frail beneficiaries.

Additional Information

- During 2003-2006, an estimated 600,000 Medicare beneficiaries are admitted to a long-term care facility each year. About 78 percent of new admissions were to a nursing home, 7 percent to an assisted living facility, and 15 percent in other facilities, including continuing care retirement communities. About 39 percent were admitted to the long-term care facility from the community, 50 percent were transferred from a SNF, and 11 percent were transferred from a hospital.

Prevalence and Patterns of Potentially Avoidable Hospitalizations in the US Long-Term Care Setting

McAndrew, R. M., Grabowski, D. C., Dangi, A., & Young, G. J. (2016). Prevalence and Patterns of Potentially Avoidable Hospitalizations in the US Long-Term Care Setting. *International Journal for Quality in Health Care*, 28(1), 104–109. <https://doi.org/10.1093/intqhc/mzv110>

Abstract

Objective: We examined the magnitude and related costs of potentially avoidable hospitalizations including re-hospitalizations for long-stay residents in nursing homes.

Design: We conducted our investigation as a retrospective cohort study where the cohort comprised individuals who were eligible for Medicare and had spent at least 120 uninterrupted days in a nursing home in New York State between 2004 and 2007. To conduct the study, we linked the Minimum Data Set, Medicare Provider Assessment File and Provider of Service File.

Measurements: We defined a potentially avoidable hospitalization as one where a resident was admitted to a hospital for which the principle diagnosis was 1 of 15 ambulatory care sensitive (ACS) conditions.

Results: Although the percentage of total hospitalizations for ACS conditions declined during the study period, 20% or more of annual hospitalizations were for ACS conditions entailing Medicare payments in excess of \$450 million. Approximately 40% of the residents who were hospitalized once for an ACS condition were re-hospitalized during the study period for the same or different ACS condition.

Conclusion: During the study period, potentially avoidable hospitalizations from nursing homes were a common occurrence in New York. A substantial percentage of such hospitalizations involved residents

who had been previously hospitalized, in some cases multiple times, for an ACS condition. Although the observed decline in ACS-related hospitalizations suggests improvements in nursing home care, various policy and managerial-level initiatives may be needed to ensure that nursing home residents are not exposed to a substantial risk of avoidable hospitalizations in the future.

Additional Information

- Over 20% of the total hospitalizations involved long-stay residents who had a principle diagnosis of one of the 15 identified ACS conditions.

Hospital and SNF Use by Medicare Beneficiaries Who Reside in Nursing Facilities

Medicare Payment Advisory Commission. (2017). Hospital and SNF Use by Medicare Beneficiaries Who Reside in Nursing Facilities. *Report to the Congress: Medicare and the Health Care Delivery System*, 267–286. Retrieved from http://www.medpac.gov/docs/default-source/reports/jun17_ch9.pdf?sfvrsn=0.

Summary

Although Medicare does not pay for the long-term portion of care, it does pay for hospital use by long-stay NF residents. In response to Medicare’s Hospital Readmission Reduction Program, some hospitals have begun to pressure NFs to adopt strategies to reduce hospital use. Through interviews with NF staff, the Commission found that these strategies include increased staff communication, staff training, medication review, and advance care planning. As a gauge of the quality of care furnished by NFs, the Commission developed facility-level measures to track use of hospitals by long-stay NF residents, including all-cause hospital admissions, potentially avoidable hospital admissions, and a combined measure of emergency department visits and observation stays. To capture the extent to which NF residents become requalified for higher paying Medicare SNF stays, a measure was developed to evaluate the long-stay beneficiaries’ use of Medicare-paid SNF care following discharge from the hospital. The Commission’s analyses were performed at the facility level and the measures were risk adjusted to make findings comparable across facilities. CMMI and the CMS Medicare–Medicaid Coordination Office launched the Initiative to Reduce Avoidable Hospitalizations among Nursing Facility Residents (RAH–NFR) for FFS beneficiaries. CMS’s RAH–NFR initiative contracts with coordinating organizations that partner with between 15 and 30 NFs (about 140 in total) to implement evidence-based clinical and educational strategies to reduce avoidable hospitalizations.

Additional Information

- Population: Long-stay residents were defined as Medicare beneficiaries who had a minimum of 100 consecutive days in the facility without a discharge to the community between June 2012 and October 2014.
- Setting: Analysis included 16,000 nursing facilities, of which 835 facilities were eventually excluded.
- On average, the risk-adjusted rates of all-cause hospital admissions was 1.6 per 1,000 long-stay resident days, 0.8 for PAHs of long-stay NF residents.
- In addition to specific states, rural facilities comprise 31 percent of facilities within the U.S. but make up 37 percent of facilities with the highest rate of all-cause hospital admissions. Furthermore, rural facilities make up 49 percent of the highest rates of PAHs.

Hospital Transfers of Skilled Nursing Facility (SNF) Patients Within 48 Hours and 30 Days After SNF Admission

Ouslander, J. G., Naharci, I., Engstrom, G., Shutes, J., Wolf, D. G., Rojido, M., ... Newman, D. (2016). Hospital Transfers of Skilled Nursing Facility (SNF) Patients Within 48 Hours and 30 Days After SNF Admission. *Journal of the American Medical Directors Association*, 17(9), 839–845.

Abstract

Background: Close to 1 in 5 patients admitted to a skilled nursing facility (SNF) are readmitted to the acute hospital within 30 days, and a substantial percentage are readmitted within 2 days of the SNF admission. These rapid returns to the hospital may provide insights for improving care transitions between the acute hospital and the SNF.

Objectives: To describe the characteristics of SNF to hospital transfers that occur within 48 hours and 30 days of SNF admission based on root cause analyses (RCAs) performed by SNF staff, and identify potential areas of focus for improving transitions between hospitals and SNFs.

Design: Trained staff from SNFs enrolled in a randomized, controlled clinical trial of the INTERACT (Interventions to Reduce Acute Care Transfers) quality improvement program performed retrospective RCAs on hospital transfers during a 12-month implementation period.

Setting: SNFs from across the United States.

Participants: 64 of 88 SNFs randomized to the intervention group submitted RCAs.

Interventions: SNFs were implementing the INTERACT quality improvement program.

Measures: Data were abstracted from the INTERACT Quality Improvement (QI) tool, a structured, retrospective RCA on hospital transfers.

Results: Among 4658 transfers for which data on the time between SNF admission and hospital transfer were available, 353 (8%) occurred within 48 hours of SNF admission, 524 (11%) 3 to 6 days after SNF admission, 1450 (31%) 7 to 29 days after SNF admission, and 2331 (50%) occurred 30 days or longer after admission. Comparisons between transfers that occurred within 48 hours and within 30 days of SNF admission to transfers that occurred 30 days or longer after SNF admission revealed several statistically significant differences between patient risk factors for transfer, symptoms and signs precipitating the transfers, and other characteristics of the transfers. Hospitalization in the last 30 days and year was significantly more common among those with rapid returns to the hospital. Shortness of breath was significantly more common among those transferred within 48 hours or 30 days, and falls, functional decline, suspected respiratory infection, and new urinary incontinence less common. SNF staff rated a higher proportion of transfers within 30 days versus 30 days or longer as potentially preventable (25.1% vs 21.5%, $P = .005$). Case descriptions derived from the QI tools of transfers back to the hospital within 48 hours of SNF admission illustrate several factors underlying these rapid returns to the hospital.

Hospitalizations of Nursing Home Residents: Background and Options

Polniaszek, S., Walsh, E. G., & Wiener, J. M. (2011). *Hospitalizations of Nursing Home Residents: Background and Options*. Retrieved from the US Department of Health and Human Services website:

<https://aspe.hhs.gov/basic-report/hospitalizations-nursing-home-residents-background-and-options>

Abstract

This report focuses on potentially avoidable hospitalizations of long-stay nursing home residents. Re-hospitalizations of post-acute care residents is also a concern, but it is not the focus of this report. ASPE is interested in understanding the factors affecting hospitalizations, especially those that can be affected by public policies. The first two parts of this report present background information on avoidable hospitalization of nursing home residents and current economic incentives related to Medicare, Medicaid, and other state and federal policies. The third section presents possible ways to re-align the incentives to support reductions in potentially avoidable hospitalizations.

Additional Information

- The report provides a section entitled “Rates of Potentially Avoidable Hospitalization among Nursing Home Residents”, which cites a few statistics from external sources:
 - 42 percent of hospitalizations of dually eligible beneficiaries in Medicaid nursing home stays were potentially avoidable in 2005 (Walsh, Freiman, Haber, Bragg, Ouslander, & Wiener, 2010).
 - 37 percent of long-stay nursing home resident hospitalizations during a 6-month period were for an ACS condition and were potentially avoidable (Intrator & Mor, 2004).

Medicare Nursing Home Resident Hospitalization Rates Merit Additional Monitoring

U.S. Department of Health and Human Services, US Office of Inspector General. (2013). *Medicare Nursing Home Resident Hospitalization Rates Merit Additional Monitoring*. (Report No. OEI-06-11-00040). Retrieved from the U.S. Department of Health & Human Services, Office of Inspector General’s website: <https://oig.hhs.gov/oei/reports/oei-06-11-00040.asp>

Summary

Nursing homes hospitalize residents when physicians and nursing staff determine that residents require acute-level care. Such transfers to hospitals provide residents with access to needed acute-care services. However, hospitalizations are costly to Medicare, and research indicates that transfers between settings increase the risk of residents’ experiencing harm and other negative care outcomes. High rates of hospitalizations by individual nursing homes could signal quality problems within those homes.

Key Information

- Participants: To identify all Medicare beneficiaries who were nursing home residents in FY 2011, the MDS and the EDB were used. The MDS contains resident Social Security Numbers (SSN), admission and discharge dates, and the related nursing home identification numbers. SSNs in the MDS were matched to those in the EDB to identify Medicare beneficiaries and their associated Medicare Health Insurance Claim Numbers.
- In FY 2011, nursing homes transferred one quarter of their Medicare residents to hospitals for inpatient admissions, and Medicare spent \$14.3 billion on these hospitalizations.
- Nursing homes with the following characteristics had the highest annual rates of resident hospitalizations: homes located in Arkansas, Louisiana, Mississippi, or Oklahoma and homes with one, two, or three stars in the Centers for Medicare & Medicaid Services’ (CMS) Five-Star Quality Rating System.
- Of the 3.3 million Medicare residents who stayed in nursing homes for at least 1 day in FY 2011, 825,765 (24.8 percent) experienced hospitalizations.

TELEMEDICINE/INTERVENTIONS

Use of Telemedicine Can Reduce Hospitalizations of Nursing Home Residents and Generate Savings for Medicare

Grabowski, D. C., & O’Malley, A. J. (2014). Use of Telemedicine Can Reduce Hospitalizations of Nursing Home Residents and Generate Savings for Medicare. *Health Affairs*, 33(2), 244–250.

Abstract

Hospitalizations of nursing home residents are frequent and result in complications, morbidity, and Medicare expenditures of more than a billion dollars annually. The lack of a physician presence at many nursing homes during off hours might contribute to inappropriate hospitalizations. Findings from our controlled study of eleven nursing homes provide the first indications that switching from on-call to telemedicine physician coverage during off hours could reduce hospitalizations and therefore generate cost savings to Medicare in excess of the facility's investment in the service. But those savings were evident only at the study nursing homes that used the telemedicine service to a greater extent, compared to the other study facilities. Telemedicine service providers and nursing home leaders might need to take additional steps to encourage buy-in to the use of telemedicine at facilities with such services. At the same time, closer alignment of the stakeholders that bear the costs of telemedicine and those that might realize savings because of its use could offer further incentives for the adoption of telemedicine.

Additional Information

- Purpose: To introduce telemedicine coverage in 11 Medicare and Medicaid certified facilities in a Massachusetts for-profit nursing home chain.
- Study Design: October 2009 – October 2010 was designated as the pre-intervention period, and November 2010 – September 2011 was the post-intervention period. The intervention comprised of equipment for two-way videoconferencing and a high-resolution camera for assessing wound care.
- Participants: The study included a sample of with a mix of post-acute and long-stay residents.
- Telehealth services provided by after-hour physicians can reduce hospitalizations by almost 10 percent.
- There was no statistically significant effect of telemedicine intervention on hospitalizations, but there is a decline in hospitalization rate at facilities with telemedicine coverage, compared to those facilities that did not have it.

Initiative to Reduce Avoidable Hospitalizations Among Nursing Facility Residents Shows Promising Results

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. <https://doi.org/10.1377/hlthaff.2016.1310>

Abstract

Nursing facility residents are frequently admitted to the hospital, and these hospital stays are often potentially avoidable. Such hospitalizations are detrimental to patients and costly to Medicare and Medicaid. In 2012 the Centers for Medicare and Medicaid Services launched the Initiative to Reduce Avoidable Hospitalizations among Nursing Facility Residents, using evidence-based clinical and educational interventions among long-stay residents in 143 facilities in seven states. In state-specific analyses, we estimated net reductions in 2015 of 2.2–9.3 percentage points in the probability of an all-cause hospitalization and 1.4–7.2 percentage points in the probability of a potentially avoidable hospitalization for participating facility residents, relative to comparison-group members. In that year, average per resident Medicare expenditures were reduced by \$60–\$2,248 for all-cause hospitalizations and by \$98–\$577 for potentially avoidable hospitalizations. The effects for over half of the outcomes in

these analyses were significant. Variability in implementation and engagement across the nursing facilities and organizations that customized and implemented the initiative helps explain the variability in the estimated effects. Initiative models that included registered nurses or nurse practitioners who provided consistent clinical care for residents demonstrated higher staff engagement and more positive outcomes, compared to models providing only education or intermittent clinical care. These results provide promising evidence of an effective approach for reducing avoidable hospitalizations among nursing facility residents.

Additional Information

- Setting: CMS selected seven Enhanced Care and Coordination Provider (ECCP) organizations, located in Alabama, Indiana, Missouri, Nebraska, Nevada, New York, and Pennsylvania. A total of 143 nursing facilities partnered with an ECCP in its state.
- Study design: A mixed-methods approach was used to evaluate ECCP interventions, entitled Interventions to Reduce Acute Care Transfers (INTERACT), on potentially avoidable transfers and other outcomes for long-stay nursing facility residents. Medicare eligibility and enrollment data from 2011-2015 CMS Minimum Data Set were used.
- The initiative began in February 2013 and ended in October 2016.

High-Intensity Telemedicine Decreases Emergency Department Use by Senior Living Community Residents

Shah, M.N., Wasserman, E.B., Wang, H., Gillespie, S.M., Noyes, K., Wood, N.E., ... McConnochie, K.M. (2016). High-Intensity Telemedicine Decreases Emergency Department Use by Senior Living Community Residents. *Telemedicine and e-Health* 22(3), 251-258. <https://doi.org/10.1089/tmj.2015.0103>

Abstract

Background: The failure to provide timely acute illness care can lead to adverse consequences or emergency department (ED) use. We evaluated the effect on ED use of a high-intensity telemedicine program that provides acute illness care for senior living community (SLC) residents.

Material and Methods: We performed a prospective cohort study over 3.5 years. Six SLCs cared for by a primary care geriatrics practice were intervention facilities, with the remaining 16 being controls. Consenting patients at intervention facilities could access telemedicine for acute illness care. Patients were provided patient-to-provider, real-time, or store-and-forward high-intensity telemedicine (i.e., technician-assisted with resources beyond simple videoconferencing) to diagnose and treat acute illnesses. The primary outcome was the rate of ED use.

Results: We enrolled 494 of 705 (70.1%) subjects/proxies in the intervention group; 1,058 subjects served as controls. Control and intervention subjects visited the ED 2,238 and 725 times, respectively, with 47.3% of control and 43.4% of intervention group visits resulting in discharge home. Among intervention subjects, ED use decreased at an annualized rate of 18% (rate ratio [RR] = 0.82; 95% confidence interval [CI], 0.70–0.95), whereas in the control group there was no statistically significant change in ED use (RR = 1.01; 95% CI, 0.95–1.07; $p = 0.009$ for group-by-time interaction). Primary care use and mortality were not significantly different.

Conclusions: High-intensity telemedicine significantly reduced ED use among SLC residents without increasing other utilization or mortality. This alternative to traditional acute illness care can enhance access to acute illness care and should be integrated into population health programs.

Keywords: aging, telemedicine, acute illness

Additional Information

- The acute care telemedicine program for SLC residents demonstrated effectiveness, with a reported 18% decrease in the rate of ED use over the course of a year, compared to no change in the rate of ED use for SLC residents without access to the telemedicine program.

DUAL-ELIGIBLE PATIENTS

Nursing Home Use by Dual-Eligible Beneficiaries in the Last Year of Life

Liu, K., Wissoker, D., & Swett, A. (2007). Nursing Home Use by Dual-Eligible Beneficiaries in the Last Year of Life. *INQUIRY: The Journal of Health Care Organization, Provision, and Financing*, 44(1), 88–103.

Abstract

Research on health care at the end of life has focused on Medicare-financed acute care services. Much less information has been available on nursing home use in the last year of life, particularly for individuals who are dually eligible for Medicare and Medicaid. We used Medicare and Medicaid enrollment and claims data to examine nursing home admissions, odds of dying in nursing homes versus hospitals or the community, and variations in Medicare and Medicaid service use and costs by place of death. We found that, in the last year of life, 75% of dual-eligible people use nursing home care, increasing age is associated with greater likelihood of dying in nursing homes, and dual-eligible people who die in hospitals have notably higher costs than other beneficiaries.

Additional Information

- Study design: Data were extracted from the “Multi-State Dual Eligible Data Files” developed by Mathematica Policy Research, Inc. The database contains enrollment and claims data for Medicare and Medicaid dual eligible in 12 states from 1994 through 1996. The Medicare and Medicaid data were linked to provide complete utilization and expenditure information from the two sources.
- Findings: Among dual-eligible people, 46% of the people in the sample were Medicaid-covered nursing home patients at the beginning of the last year of their lives. Over the course of the year, another 22% used NF care, so that a total of 68% of dual-eligible people used Medicaid NF care in the last year of life.

Dual Eligibility, Selection of Skilled Nursing Facility, and Length of Medicare Paid Postacute Stay

Rahman, M., Gozalo, P., Tyler, D., Grabowski, D. C., Trivedi, A., & Mor, V. (2014). Dual Eligibility, Selection of Skilled Nursing Facility, and Length of Medicare Paid Postacute Stay. *Medical Care Research and Review*, 71(4), 384–401. <https://doi.org/10.1177/1077558714533824>

Abstract

Medicare and Medicaid dual-eligible beneficiaries use more medical care and experience worse health outcomes than Medicare-only beneficiaries. This article points to a possible inefficiency in the skilled nursing facility (SNF) admission process, specifically that patients and SNFs are partially matched based on dual-eligibility status, and investigates its influence on patients’ SNF length of stay. Using a set of fee-for-service beneficiaries newly admitted for Medicare-paid SNF care, two findings were documented: (1) compared with Medicare-only patients, dual-eligibles are more likely to be discharged to SNFs with low nurse-to-patient ratios and (2) dual-eligibles are more likely to become long-stay nursing home residents than Medicare-only beneficiaries if treated in SNFs with low nurse-to-patient ratios. Changes in the current SNF care referral process are concluded to have the potential to reduce

excess SNF utilization by dual-eligible beneficiaries and could help reduce spending by both Medicare and Medicaid.

Additional Information

- Data: Used Minimum data set (MDS), Medicare Standard Analytic File (Claims), Medicare enrollment file, Online Survey Certification and Reporting System (OSCAR), and Census for the year 2000.
- About 30% of all dual-eligible patients became long-stay (>100 days) nursing home residents following their hospital discharge compared with 15% of Medicare-only beneficiaries.
- More than 36% of all Medicare-only residents were discharged to the 20% (2,955) of nursing homes with the highest nurse staffing whereas only 27% of dual-eligibles were discharged to such facilities. In contrast, only 9% of Medicare-only residents were discharged to facilities with the lowest nurse staffing, while 13% of dual-eligible patients were discharged to these facilities.
- After hospitalization, 30 percent of dual-eligibles are more likely to become long stay NH residents after hospital discharge compared with 15 percent of Medicare-only beneficiaries.

Medicare-Medicaid Eligible Beneficiaries and Potentially Avoidable Hospitalizations

Segal, M., Rollins, E., Hodges, K., & Roozeboom, M. (2014). Medicare-Medicaid Eligible Beneficiaries and Potentially Avoidable Hospitalizations. *Medicare & Medicaid Research Review*, 4(1), E1–E13.
<https://doi.org/10.5600/mmrr.004.01.b01>

Abstract

Objective: Potentially avoidable hospitalizations have been identified by experts as leading to poor health outcomes and costly care. Potentially avoidable hospitalizations are particularly common among full-benefit dual eligible beneficiaries. This paper examines potentially avoidable hospitalizations rates by setting, state, and medical condition, and the average cost of these events.

Methods: This analysis identifies potentially avoidable hospitalizations using diagnosis codes identified by an expert panel. Settings of care are determined using a timeline file, which assigns an individual to a specific setting on a particular day.

Population/Data Source: The analysis uses several different datasets from the Chronic Conditions Data Warehouse. The study population includes fee-for-service beneficiaries who were eligible for both Medicare and full Medicaid benefits for at least one month during the calendar year. The study years are 2007 to 2009.

Results: In 2009, among our study population, 26 percent of hospitalizations were potentially avoidable; and the rate was 133 per 1,000 person-years. Potentially avoidable hospitalizations were much more likely for those beneficiaries who were in institutions—16 percent of beneficiaries in our study population were in an institution, yet comprised 45 percent of all potentially avoidable hospitalizations. The range in rates across the states was considerable, with more than a threefold difference across states. Five conditions were responsible for nearly 80 percent of potentially avoidable hospitalizations. From 2007 to 2009, the national and state rates were fairly consistent.

Discussion: This analysis indicates that the potentially avoidable hospitalization rate among MME beneficiaries was consistently high from 2007 to 2009. This bears monitoring in the future to see if the Centers for Medicare & Medicaid Services' various initiatives have led to a reduction in rates.

Keywords: Dual Eligibles/MMEs, Potentially avoidable hospitalizations, quality metrics, readmissions, Medicaid, Medicare, quality of care, patient safety (measurement)

Additional Information

- According to 2009 Chronic Condition Warehouse data, over 600,000 or 26 percent of 2.3 million hospitalizations for MMEs were considered potentially avoidable.
- SNFs are shown to be the care setting with the highest rate of PAHs, with a rate of 690 per 1,000 person-years compared to Medicaid NF with a rate of 285 per 1,000 person-years.

In 2007 to 2009, there were 10 states observed to have the highest and lowest rates of PAHs. Those with the highest rate of PAHs were: Arkansas, Illinois, Indiana, Kansas, Kentucky, Louisiana, Mississippi, New Jersey, Ohio, and Oklahoma (2007-2008) and Tennessee (2009). Those with the lowest rates of PAHs in were: Alaska, California, Hawaii, Idaho, Maine, Minnesota, New Mexico (2007-2008), Oregon (2009), Utah, Vermont, and Washington.

Potentially Avoidable Hospitalizations of Dually Eligible Medicare and Medicaid Beneficiaries from Nursing Facility and Home- and Community-Based Services Waiver Programs

Walsh, E. G., Wiener, J. M., Haber, S., Bragg, A., Freiman, M., & Ouslander, J. G. (2012). Potentially Avoidable Hospitalizations of Dually Eligible Medicare and Medicaid Beneficiaries from Nursing Facility and Home- and Community-Based Services Waiver Programs. *Journal of the American Geriatrics Society*, 60, 821-829

Abstract

Objectives: Beneficiaries dually eligible for Medicare and Medicaid are of increasing interest because of their clinical complexity and high costs. The objective of this study was to examine the incidence, costs, and factors associated with potentially avoidable hospitalizations (PAH) in this population.

Design: Retrospective study of hospitalizations.

Setting: Hospitalizations from nursing facilities (NF) including Medicare and Medicaid-covered stays, and Medicaid Home and Community-Based Services (HCBS) waiver programs.

Participants: Dually eligible individuals who received Medicare skilled nursing facility (SNF) or Medicaid NF services or HCBS waiver services in 2005.

Interventions: None.

Measurements: Potentially avoidable hospitalizations were defined by an expert panel that identified conditions and associated Diagnostic Related Groups (DRGs) which can often be prevented or safely and effectively managed without hospitalization.

Results: More than one-third of the population was hospitalized at least once, totaling almost 1 million hospitalizations. The admitting DRG for 382,846 (39%) admissions were identified as PAH. PAH rates varied considerably among states, and blacks had a higher rate and costs for PAH than whites. Five conditions (pneumonia, congestive heart failure, urinary tract infections, dehydration, and chronic obstructive pulmonary disease/asthma) were responsible for 78% of the PAH. The total Medicare costs for these hospitalizations were \$3 billion, but only \$463 million for Medicaid. A sensitivity analysis, assuming that 20%–60% of these hospitalizations could be prevented, revealed that between 77,000 and 260,000 hospitalizations and between \$625 million and \$1.9 billion in expenditures could be avoided annually in this population.

Conclusion: Potentially avoidable hospitalizations are common and costly in the dually eligible population. New initiatives are needed to reduce PAH in this population as they are costly and can adversely affect function and quality of life.