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The Effect of Inpatient Palliative Care Consultations on Hospital Readmission Rates for those with Alzheimer's Disease

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THE EFFECT OF INPATIENT PALLIATIVE CARE CONSULATIONS ON HOSPITAL READMISSION RATES FOR THOSE WITH ALZHEIMER'S DISEASE

BY

Cynthia Lynn Smoak

A doctoral project submitted to the faculty of the Medical University of South Carolina in partial
fulfillment of the requirements for the degree
Doctor of Health Administration
in the College of Health Professions

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DEDICATION

To my mother…for the countless emails back and forth editing my papers so that my thoughts could be conveyed and for always encouraging me when I would get overwhelmed.

And to my father…for instilling in me that education was never an option.

To my healthcare colleagues, Alzheimer's advocates, and palliative care professionals…I stand behind you, support you, and will continue to be a warrior for your causes.

To DHA Cohort 13…we are DONE! I love each one of you. The conversations in class, countless group emails, and phone calls just to check in were invaluable.

To Dr. Patrick Rosopa…stats make sense…sort of. I'm glad we have people like you in the world to help people like me.

To my students…find your passion and always continue to learn.

And finally to the special man in my life…you encouraged me, pushed me, and held my hand when I needed it. Thank you for believing in me and standing by me to the end. I cannot wait to spend the rest of our lives together.

ACKNOWLEDGEMENTS

Why Palliative Care and Alzheimer's?

I was blessed to have a mother who was much attuned to me growing up. She realized I had a love for the elderly and fostered that love. Starting at the age of 13 I volunteered for a county ran Medicaid skilled nursing facility. It was there I was able to call Bingo, fill ice pitchers, pass out mail, and spend time with the residents who particularly did not have family present. It was there that I first became exposed to Alzheimer's disease.

I was one of the few who knew the direction they wanted their life to go in college. I knew I wanted to make an impact on care for the elderly. I also knew bodily functions were not my strong suit. In my opinion, I was mentored by the best, James O. Hacker at Winthrop University. He understood my passion and kept me focused on long term care when my classmates were dreaming of being CEOs at large hospitals. He pushed me in the right direction of working in an Assisted Living Facility.

I was blessed to have worked with some really great leaders in the long-term care arena. It was there I grew in my devotion to learning more about Alzheimer's disease. I saw the effects on the brain, body, family, and caregivers. I saw how this dreaded disease caused pain, frustration, and affliction in families. It was then when I found my passion.

In one of the facilities I had a special resident that suffered with Alzheimer's. As the months passed, her disease progressed rapidly. She was unable to speak, walk, or recognized her loved ones. It was then that hospice was called in to assist her caregivers and family in coping with her dying process. I got to see this process unfold right before my very eyes. The conversation in regards to the inevitable end, the education by the hospice team to family in regards to dying process and the education to the staff in terms of clinical signs and symptoms. I got to see the amazing efforts of the social worker and chaplain preplanning for when her day in glory would come. Most of all, I got to see how her family accepted her death before it happened and was able to celebrate her life afterwards. This was just beautiful.

After experiencing this process over many months, I made a career change to work in hospice care. I wanted that beautiful process that I got to witness to happen for all families. During this career change, I was able to also work on my Masters in Health Administration from the Medical University of South Carolina. I was growing both personally and professionally. I learned, unfortunately, that the dying process is not always as idealistic as what I had experienced. They are always factors of a patient struggling with their personal wishes versus those of the family. Providing education to the family was always my top priority. Then I would assist the team of caregivers in coming to one common approach that encompassed the goals of care for the patient.

Bringing my two loves together, Alzheimer's and Palliative Care, has been personally and professionally rewarding. Leaving a footprint on a person's life is taken with great humility and responsibility. It is my passion and I encourage others to find their passion and make a difference. We must search for better standards of care and develop methods to measure improvement. Most of all, love what you do and pass it on to those you care for.

WITH GRATITUDE

Words seem inadequate when it comes to expressing my gratitude for the guidance I have received from the Medical University of South Carolina. Growing up in South Carolina, it was always revered as the best place for top-notch care. The reputation of the hospital was second to none. The fact I was able to achieve both a Master's and Doctorate from this institution makes me proud. The level of education I received from leaders in their field cannot be duplicated. Drs.

Zoller, Kilpatrick, Simpson, White, and Jones' styles of teaching created the perfect mix of scholarly stimulation with real world know how.

I especially want to thank my dissertation committee. Dr. Jones, Chair, thank you for your guidance and sharing the love of your mother with me. I want to be an advocate for her. Dr. Kit Simpson, my methods guru, your mind is beyond brilliant. The fact that you can make statistical methods interesting is the best asset of your teaching. Dr. William (Bill) Logan – the love, passion, and dedication you have for the geriatric community and palliative care shines through. You impacted my life many years ago and inspired me even when you did not know you were. I will try to do that for others as you have done for me. I am forever grateful in the roles each of you played in my professional development.

Lastly, I would love to acknowledge DHA Cohort 13. Thank you for your support, laughter, and guidance throughout our three years together. From our fun leadership classes to our pull your hair out methods classes, we stuck by each other and encouraged each other. Your companionship, camaraderie, and friendships are the highlight of my journey. The blending of our cultures, ages, and experiences made for a perfect amalgamation for learning. From our lunches, dinners out, countless bottles of wine, and encouraging phone calls and emails along the way, I salute you.

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ABSTRACT

Background: Evidence suggests that inpatient palliative care consultation (IPC) services improve the likelihood of fewer hospital readmissions for those with Alzheimer's disease and dementia.

Objective: This study examines the difference in readmission rates for Alzheimer's patients with and without inpatient palliative care consultations.

Design: This is a retrospective data analysis using an inception cohort derived from HCUP archival data from the state of Florida for the year 2012. Only acute care patients with a diagnosis of Alzheimer's disease or dementia who were hospitalized for either the dementia condition or because of acute urinary tract infection (UTI), pneumonia, congestive heart failure (CHF) were included in this study.

Methods: Analyses were performed using SAS v 9.3. Mean values and percentages were used for description and population. Differences between groups were tested using chi-square and *t*-test or non-parametric statistics as appropriate. Multivariable modeling was performed using logistic regression.

Results: Of the 7308 patients in our study, 1266 (17.3%) were readmitted within 30 days. However, only 1.9% of the readmitted patients received and inpatient palliative care consultation during the index admission.

Conclusions: Inpatient palliative care consultations do positively affect the hospital readmissions rates for those with Alzheimer's and dementia.

INTRODUCTION

Background

We are an aging nation. The number of Baby Boomers, those born between 1946 and 1964, are now utilizing our health care system more than ever. Many are doing so with a chronic illness such as dementia, or more specifically, Alzheimer's disease. The United States spends more per capita than any country on healthcare, yet the quality of care is often fragmented with very little communication and tremendous strains on family caregivers. To combat costs and improve patient satisfaction, hospitals have been implementing palliative care programs with specialists who can assist patients to navigate their disease trajectory. Unfortunately those who are functionally and mentally impaired must circumnavigate among care providers who have vastly different objectives, workforce abilities, and quality and payment incentive models.

Palliative Care has been offered in the United States since the 1970's. Hospice care, care for those who have a terminal illness, has been reimbursed by Medicare since 1982. The growth has expanded from one hospice in 1974 to over 5000 today (Lutz, 2011). These services, although performed in many different healthcare arenas, assist in helping the patient navigate their disease process in a pain free manner while managing symptoms of their disease through an interdisciplinary approach (Morrison & Meier, 2011). Palliative care programs moved into Academic Medical Centers first and have progressed to smaller, more rural hospitals. The concept has achieved recognition as a best practice in care management. As with the development of any new program or service, the dissemination of data, implementation of evidenced based care, and adoption of protocols will happen at different rates depending on the champion leadership that it is given.

Focus on Hospital Readmission Rates

The Patient Protection and Affordable Care Act designates reduction of avoidable re-hospitalizations as a target for health care cost savings and authorizes lower payments to hospitals with high risk-standardized rates of readmission. Reducing re-admission rates may be facilitated by a provision of the legislation (section 3026 of HR 3590) that provides $500 million to the Centers for Medicare & Medicaid Services to fund the Community-based Care Transitions Program. The Medicare Payment Advisory Commission has estimated that three quarters of such re-hospitalizations may be avoidable and annually account for billions in excess health care costs (Hansen, Young, Hinami, Leung, & Williams, 2011). Medicare is thus looking at readmission rates now as a quality measure, openly publishing the rates of readmission among patients with acute myocardial infarction, congestive heart failure, and pneumonia, comparing hospitals across the nation (Cakir & Gammon, 2010). While this is the start, the medical community expects the number of diagnosis reported and monitored will continue to grow as it did in 2014 with the addition of readmissions for hip and knee replacements and those suffering from chronic bronchitis (Rau 2014).

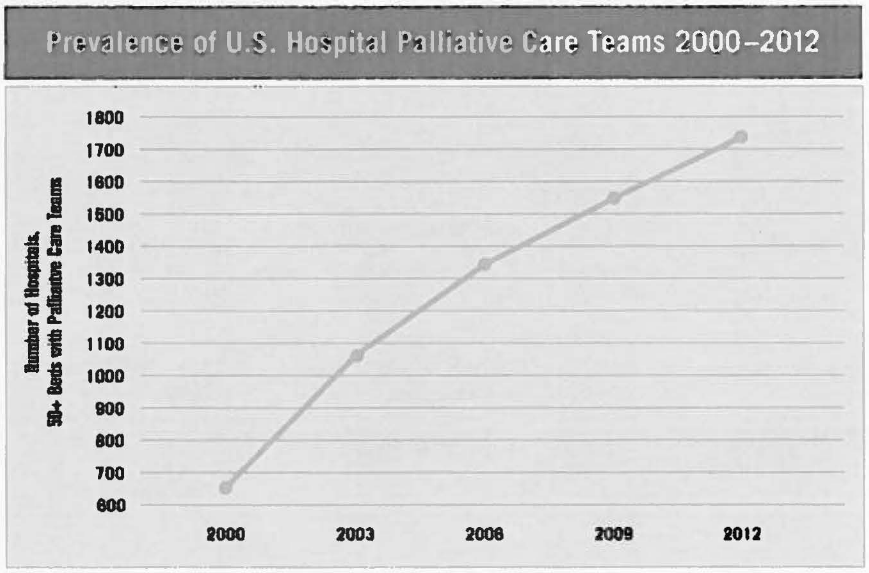
The National Pilot Program on Payment Bundling (Section 3023), established in January 2013, is a retrospective payment for hospitals for episodic-based care. More specifically the episode of care to be covered under the proposed models will begin days before the hospital admission and extend through thirty or ninety days after discharge. Participating providers may receive bundled payments for inpatient, physician, outpatient, and post-acute care services. A bundled payment, or set dollar amount, is to be paid to an integrated delivery system for the total episode of care with no additional payment for specific services such as physician visits or post-acute care. Bundles have the potential to reduce costs, have providers deliver care in the lowestcost setting to maximize their operating margin, and potentially avoid expensive post-acute stays. While this method will put a greater focus on the transition process from the hospital to home, it does not pay for any long-term care nursing home services (Naylor et al., 2012).

There are several other methods proposed to minimize readmissions. They focus on developing better processes for care, implementing lean methodologies, improve discharge planning, and develop partnerships along the continuum of care. While partnerships, such as Accountable Care Organizations (ACOs), are not showing reductions across the board, they are incentivizing providers to not only tweak how care is delivered, instead they are redesigning it all together (Caramanica & Delk, 2014). This redesigning of health care processes will hopefully advance how palliative care programs are implemented in the acute care setting.

Palliative Care Programs in the Hospital

Historically, palliative care was only offered to patients with a cancer diagnosis. However, it has expanded to all patients with a chronic or incurable diagnosis (Bush & Shahwan-Akl, 2013) including to those individuals who have been diagnosed with Alzheimer's disease or other dementias. (See Figure 1). An inpatient palliative care consultation (IPC), like other specialist consultation, is typically initiated at the request of the treating physician. IPC teams communicate their recommendations back to the referring physician for implementation. Additionally, palliative teams focus on clarifying diagnoses and treatment options, helping patients and family members identify goals of care, and helping them select, in conjunction with their treating physicians, the treatments and hospital discharge options that meet those goals (Morrison et al., 2011).

Figure 1. Prevalence of US Hospital Palliative Care Teams



Source: Center to Advance Palliative Care, July 2014

IPCs for Alzheimer's disease and related Dementias

Alzheimer's disease is recognized as the leading cause of dementia, and is a chronic degenerative progressive disease. Along with the other dementias, disease progression in the moderate-to-severe stages share a common clinical pathway, being that ultimately admission to a specialty dementia unit, nursing home, or an acute general hospital may happen for a multitude of reasons (Coleman, 2012). Earlier recognition of dementia patients and subsequent IPCs are needed to better manage predictable complications and relieve overall suffering. In particular, IPC services can help diagnose dementia, create an opportunity to conduct a well-informed goals of care discussions, provide guidance in understanding prognosis, manage patients' distressful symptoms, provide emotional, spiritual, and social support for the patient and caregivers, and explore the services available at home to improve access to care upon hospital discharge (Ouchi et al., 2014).

Current Political Environment

Current Medicare regulations have an adverse impact on hospice access for individuals with Alzheimer's because of the requirement of a six-month survival prognosis certified by two physicians. The most common cause of mortality in advanced AD are concurrent infections, which occur and recover at unpredictable rates. Therefore, the determination of a six-month survival prognosis cannot be made with a high degree of certainty. The complexity of managing comorbid conditions and the transition to appropriate end-of-life care creates challenging and costly issues of care coordination between health care providers and community service providers. At the same time, the current inability to cure Alzheimer's disease and related dementias gives scientists a strong desire to discover early interventions to keep people from developing dementia and beginning what is now an inexorable decline (Bynum, 2014).

In its report to Congress on March 25, 2009, the Alzheimer's Study Group, a task force co-chaired by former House Speaker Rep. Newt Gingrich (R-GA) and Sen. Bob Kerrey (D-NE) along with leading experts in federal health policy, presented recommendations to accelerate and focus national efforts to address the growing Alzheimer's crisis. These recommendations spurred the creation of the National Alzheimer's Project Act (NAPA), which was signed into law by President Barack Obama on January 4, 2011, after unanimous passage in the final days of the 111th Congress. Fundamentally, then, the Alzheimer's Study Group recognized that Alzheimer's is currently placing a staggering burden upon society as a result of the costs of caring and supporting those with Alzheimer's and their caregivers. This burden will increase sharply in the coming decades, and the only feasible means of altering this trajectory is through biomedical research that yields effective interventions (Egge, 2014).

Two significant activities were undertaken to assess the scale and scope required to successfully reach the 2025 goal of "Prevent and effectively treat Alzheimer's disease by 2025." The first was conducted by a task force of leading researchers in the field, the Alzheimer's Association Expert Advisory Work-group on NAPA. In an effort to inform those implementing NAPA, this workgroup assessed requirements in scientific and technological areas, infrastructure and research resource spheres, and administrative and organizational domains. Taken together, the workgroup's professional judgment budget estimated that a successful effort would require at least $2 billion per year over ten years (Egge, 2014).

The second effort was the Alzheimer's Disease Research Summit 2012: Path to Treatment and Prevention, under the direction of the NIH and the NIA. The summit convened more than 500 participants; although participants did not attempt to develop budgetary estimates, their work did also culminate in an assessment of research requirements and a corresponding series of recommendations (Egge, 2014).

Problem Statement

It is unclear if inpatient palliative care consultations make a difference for those with Alzheimer's disease. We do know individuals with Alzheimer's and other dementias have more than three times as many hospital stays per year as other people in the same age brackets. In 2008, there were 780 hospital stays per 1000 Medicare beneficiaries age 65 and older with AD and other dementias compared with 234 hospital stays per 1000 Medicare beneficiaries age 65 and older without these conditions. The most common reasons for hospitalization of people with AD include syncope, fall and trauma, ischemic heart disease, and gastrointestinal disease (Thies & Bleiler, 2013).

Based upon these considerations, Daiello, Gardner, Epstein-Lubow, Butterfield, and Gravenstein (2014) hypothesized that older adults with a diagnosis of dementia would be more likely to be quickly re-hospitalized following an acute care stay, compared to their peers without dementia. Grim, McElwain, Hartmann, Hudak, and Young (2010) stated the top reasons for re-admission of those receiving palliative care were disease progression and the development of co-morbidities. This is not surprising for those who suffer from dementia as the number of comorbid conditions is generally significant.

Hypothesis

Hypothesis 1: **Inpatient Palliative Consultations will reduce hospital readmissions for patients who are suffering from Alzheimer's disease and dementia.** This study will show the benefit of utilizing IPCs in regards to costs, lengths of stay for initial admissions, and reductions in re-admissions.

Hypothesis 2: **This study will show the effect of the inpatient palliative care consultations has on reducing re-hospitalization is reduced as the number of comorbidities increases.**

Target Audience for the Study

This research can have implications for several groups of people. Hospitals, palliative care practitioners, and advocates for those who have Alzheimer's disease are greatly affected by this research. Although the number of readmissions may be declining over the past two years for Medicare hospital readmissions, the fines are increasing at an alarming rate. In fact, over 2,610 hospitals were fined in 2014 (Rau, 2014). With reimbursement methodologies increasingly becoming more of a focus, hospital administration should review care delivery models and the welfare of their patient after discharge. Palliative care professionals need to be aware of how hospital readmission rates affect them. As hospital administrators are looking at ways to reduce costs, they will look to the palliative care team to initiate contact to those patients who seem to be admitted frequently, often initiating care in the emergency room. Partnerships will need to be formed between health systems and hospice organizations to ensure proper diagnosis, prognosis, and follow-up care can be delivered. Finally, those that advocate for individuals with Alzheimer's disease and related dementia's need to understand the changing face of the healthcare environment. They need to understand the care delivery system is changing and tools and resources will have to be obtained in order to adequately care for those with this disease. Without the proper education on how to effectively cope with this disease, the revolving door of the hospital will continue to turn.

Definition of Terms

Several terms will be used throughout this dissertation. Often, they are used interchangeably, when, in fact, they have very distinct meanings. This section will educate the reader on the exact meaning of each of definition.

Dementia – Dementia does not describe a specific disease. Instead it explains an array of symptoms associated with a decline in memory or other thinking skills severe enough to diminish a person's ability to perform daily tasks. This term is often misused as senility, which describes the normal progress of the mind aging.

Alzheimer's disease (AD) – Alzheimer's disease is the most common form of dementia where nerve cells in the brain deteriorate and die. Alzheimer's affects different people in different ways. Symptoms include memory loss that disrupts daily life, difficulty in completing familiar tasks, difficulty in ascertaining visual images, the inability to retrace steps, withdrawal from work or social activities, among many others. Those with advanced dementia may need help with activities of daily living, fail to recognize loved ones, and often become vulnerable to infections (Alzheimer's, 2010).

Hospice - A model of quality care exhibiting compassion for those who have a life-limiting illness. Care is provided in an interdisciplinary approach addressing emotional, spiritual, and physical needs of the patients and their family. It focuses on caring for the patient in any location they reside and does not discriminate based on age, religion, race, or illness. It is reimbursed by Medicare, Medicaid, most private insurance plans, and other managed care organizations (NHPCO, n.d.).

Palliative Care (PC) - The World Health Organization states palliative care is an approach that improves the quality of life of patients and their families facing the problems associated with life-threatening illness, through the prevention and relief of suffering by means of early identification and impeccable assessment and treatment of pain and other problems, physical, psychosocial and spiritual (Lutz, 2011).

Inpatient Palliative Care Consultation (IPC) – Services provided by an interdisciplinary team to address pain and symptom control, lack of communication with physician's and staff, and unwanted life-sustaining treatments by not only addressing the patient's physical needs but also their spiritual and psychosocial needs by aligning treatment choices with patients values and goals (Armstrong, Jenigiri, Hutson, Wachs, & Lambe, 2013).

Figure 2. All hospice care is palliative care, but not all palliative care is hospice care.

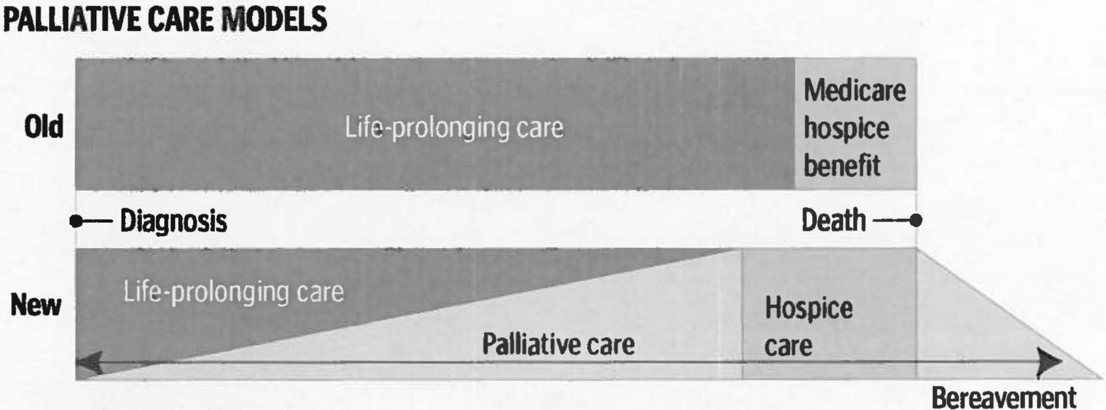
Source: (NHPCO www.nhpco.org)

The Difference Between Hospice and Palliative Care

Palliative care in the USA has evolved from a singular focus on persons at the end-of-life, for which care was solely directed on comfort, to a more broad-based interdisciplinary specialty that addresses the needs of all seriously ill persons and their families. See Figure 3. US palliative care is now conceptualized as patient-centered and family-centered care that optimizes quality of life by anticipating, preventing, and treating suffering. A Department of Health, task force in 1978 reported that "the hospice movement as a concept for the care of the terminally ill and their families is a viable concept and one which holds out a means of providing a more humane care for Americans dying of terminal illness while possibly reducing costs" (Morrison, 2013).

Eligibility for hospice under Medicare requires that two physicians certify that the patient will die within 6 months 'if the disease runs its normal course' and that the patient agrees to forego regular insurance coverage for life-prolonging and curative treatments. In 2011, there were approximately 2,513,000 deaths in the USA with 1,059,000 (46%) of those deaths occurring under the care of one of over 5000 hospices (Morrison, 2013). Both hospice and non-hospice professionals have participated in extending the hospice methodology through development of palliative care services. Palliative care may be delivered concurrently with all appropriate curative and life- prolonging interventions (Meier, 2006).

Figure 3. Conceptual Shift in Palliative Care Models



Source: Center to Advance Palliative Care

LITERATURE REVIEW

A search was conducted utilizing the Ovid (Medline) database using English language papers published in peer-reviewed journals from 2000-2015. Inclusive, broad terms such as Alzheimer's, dementia, hospital readmissions, palliative care, and inpatient palliative care consultations were applied. Resources were also used from organizations such as the Alzheimer's Association, National Hospice and Palliative Care Organization, and the Center to Advance Palliative Care. In addition, experts in the fields of palliative care, Alzheimer's disease, and research methodologies were consulted. Reference lists of all included studies were reviewed for additional or subsequent publications.

The goal of the literature review is to gain a broader understanding of previously published studies on hospital readmissions for those with Alzheimer's disease and how inpatient palliative care consultations may or may not assist with subsequent admissions. Through this literature review, the reader should gain a broader understanding of the importance that should be placed on inpatient palliative care consultations for those who suffer with Alzheimer's disease.

Focus on Hospital Readmissions

Readmissions are common in the hospital setting, especially for those that are elderly, frail, and have many co-morbid conditions. To this fact, add the increasing cost of healthcare services and the need for policy change. Cakir and Gammon (2010) estimate the number of individuals that are readmitted to the hospital within 30 days falls between 14.1% and 23.2%, but when you assess for factors like socioeconomic issues, those numbers rise dramatically. In 2013, nearly 18% of Medicare patients who had been hospitalized were readmitted within 30 days. This cost Medicare $26 billion dollars. Of that, $17 billion were from potentially avoidable readmissions (Rau, 2014).

The Hospital Readmission Reduction Program (HRRP), an effort on behalf of the Centers for Medicare and Medicaid Services (CMS) began in October 2012. Its aim was to reduce admissions for patients diagnosed with myocardial infarction, pneumonia, and congestive heart failure (Joynt & Jha, 2013). CMS added three additional diagnoses in 2015. Those readmitted with exacerbation of chronic obstructive pulmonary disease, elective total hip arthroplasty, and elective total knee arthroplasty will now be included in the HRRP program (Centers for & Medicaid Services, 2014).

While there is evidence that a change in hospital processes need to occur to reduce cost, many argue on the penalties assessed. Penalties have increased 1% since the inception of the HRRP and will be increased to 3% in 2015. Gu et al. (2014) also make two controversial points about the program. First, should the hospital be the place to receive the penalty when the events that led up to the readmission take place outside of the hospital. Second, and more complicated, has to deal with the individuals who are at risk: those who are the sickest and those who are socioeconomically disadvantaged. With the program going into its third year, we are seeing that safety net hospitals and academic medical centers are a large portion of those being penalized. Those two entities are the ones who see our sickest patients and those who suffer from economic disparities. In 2006 Medicare spending for patients who had mental deficits in addition to physical chronic conditions was twice as much as those who did not have any mental deficits (Naylor et al., 2012).

In order for newer models of care to be implemented, improved relationships need to occur between providers, patients, payers, regulators, and community service organizations. Hospitals and healthcare organizations often work in silos. In order for integration to occur, greater collaboration within these groups will need to come together to create a shared vision and a mutual accountability for the defined patient population. Well-Star Health System, an integrated delivery system in the southeast, includes 5 hospitals, home care, long-term acute care, long-term nursing care, residential, an in-patient hospice, and a large physician group. This group was an early participant in the Medicare Shared Savings Plan serving 38,000 beneficiaries. They have learned the best way to take care of their patients is outside the four walls of the hospital. They effectively manage chronic conditions such as Alzheimer's, congestive heart failure, and COPD in the outpatient setting. In the first year, Wellstar saw a 15.5% reduction in hospital readmissions and a 4.8% reduction in emergency department utilization (Caramanica & Delk, 2014).

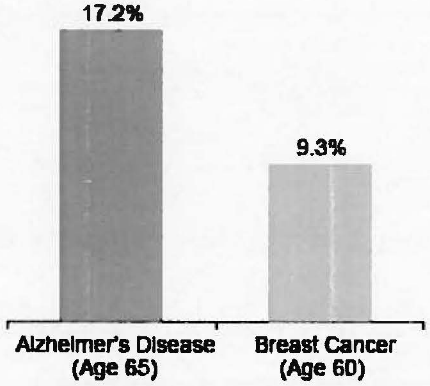
Understanding Alzheimer's

Alzheimer's is a form of dementia. To meet DSM-IV criteria for dementia, the following are necessary. Symptoms must include decline in memory as well as in at least one of the following cognitive capabilities: (1) ability to speak coherently or understand written language, (2) ability to recognize or identify objects, assuming intact sensory function, (3) ability to perform motor activities, assuming intact motor abilities and sensory function and comprehension of the required task, (4) ability to think abstractly, make sound judgments and plan and carry out certain tasks. Those with Alzheimer's often demonstrate memory loss that disrupts daily life, challenges in planning or solving problems, difficulty completing familiar tasks at home, at work, or at leisure, confusion with time or place, trouble understanding visual images and spatial relationships, new problems with words in speaking or writing, misplacing things and losing the ability to retrace steps, decreased or poor judgment, and changes in mood or personality (Thies & Bleiler, 2013). As one can imagine, having a loved one who was once independent with the tasks of daily life now depending on a family member with the help of a healthcare professional can be burdensome for all, especially in regards to cost.

Alzheimer's Disease by the Numbers

An estimated 5.2 million Americans of all ages have AD in 2013. This includes an estimated 5 million people age 65 and older and approximately 200,000 individuals younger than age 65 who have early onset AD. One in nine people age 65 and older (11%) has AD. About one third of people age 85 and older (32%) have Alzheimer's. Of those with AD, an estimated 4% are younger than age 65, 13% are 65 to 74 years old, 44% are 75 to 84 years old, and 38% are 85 years or older. Of the 5 million people age 65 years and older with AD in the United States, 3.2 million are women and 1.8 million are men. The larger proportion of older women who have AD and other dementias is explained primarily by the fact that women live longer, on average, than men. See Figure 4. People with fewer years of education appear to be at higher risk for AD and other dementias than those with more years of education. Data indicates that, in the United States, older blacks are probably about twice as likely to have AD and other dementias as older whites, and Hispanics are about 1.5 times as likely to have AD and other dementias as older whites (Thies & Bleiler, 2013).

Figure 4: Remaining Lifetime Risk of Women Developing Alzheimer's Disease □and Breast Cancer



Source: (alz.org)

The increasing level of education among older adults over the past 20 years may influence the prevalence and outcomes of dementia in the future. Currently, the proportion of adults over 65 with a high school diploma increased from 53.0% in 1990 to 72.0% in 2003, whereas the proportion with a college degree increased from 11.0% to 17.0% during this same period. More years of formal education are associated with a reduced risk of dementia, likely through multiple causal pathways, including a direct effect on brain development and function (i.e., the building of "cognitive reserve"), better health behaviors, and the general health advantages of having more wealth and social opportunities (Rocca et al., 2011).

Despite some evidence of racial differences in the influence of genetic risk factors on AD and other dementias, genetic factors do not appear to account for these large prevalence differences across racial groups. Instead, health conditions such as high blood pressure and diabetes mellitus, which may increase one's risk for AD and other dementias, are believed to account for these differences because they are more prevalent in black and Hispanic people. Lower levels of education and other socioeconomic characteristics in these communities may also increase risk (Thies & Bleiler, 2013).

While prevalence is the number of existing cases of a disease in a population at a given time, incidence is the number of new cases of a disease that develop in a given time period. The estimated annual incidence (rate of developing disease in 1 year) of AD appears to increase dramatically with age, from approximately 53 new cases/1000 people age 65 to 74 years, to 170 new cases/1000 people age 75 to 84 years, to 231 new cases/1000 people age 85 years and older (Thies & Bleiler, 2013).

Current Expenditures for Alzheimer's

The cost of Alzheimer's is enormous. In 2014 Medicare and Medicaid estimated they would spend $150 billion for health care and long-term care cost for people with Alzheimer's and related dementias. Not included in that figure is the 36 billion patients, families, and caregivers would have to pay during that same time. The annual cost of care for someone with Alzheimer's is nearly $47,000. That is three times the amount than someone who does not have the disease. In addition to the out of pocket costs, more than 15 million people will provide 17.7 billion hours of unpaid caregiving time, valued at $220 billion (Alzheimer's Association National Plan Milestone et al., 2014).

Another concern is those with dementia might be more likely to be readmitted shortly after hospital discharge. To varying degrees, dementia impairs patients' abilities to benefit from discharge education; adhere to instructions regarding after-hospital care; or report symptoms, potentially delaying the diagnosis and treatment of conditions such as urinary tract infections, congestive heart failure, and pneumonia, where timely outpatient management may avoid hospitalizations (Daiello et al., 2014).

Looking at dementia globally is also a factor of concern. In the 2010 report, Alzheimer's Disease International estimated the global economic impact of dementias to be US$604 billion.

The report illustrates this in terms of comparisons with the turnover of companies in that year. If this level of cost were income, this would make dementia the world's largest company by turnover, bigger than Wal-Mart and Exxon Mobil. If dementia were a company it would be the world's 18th largest economy. Currently, 90% of the global costs of dementia fall to the developed world with 70% attributable to Western Europe and North America; at present less than one percent of costs are borne by low-income countries. However, this will change predictably and change quickly (Banerjee, 2012).

Palliative Care Outcome Measurements

Palliative care outcomes can be measured in several different ways. They can be measured in dollars spent versus money saved, desired health outcomes of the patient, degree of patient satisfaction, and degree of provider satisfaction. Each hospital measures outcomes differently. Initially programs focus on dollars spent versus saved while more established programs are concerned with patient and provider satisfaction.

Morrison et al. (2008) analyzed administrative data from 8 hospitals with established palliative care programs for the years 2002 through 2004. Patients receiving palliative care were matched by propensity score to patients receiving usual care. Generalized linear models were estimated for costs per admission and per hospital day. Of the 2966 palliative care patients who were discharged alive, 2630 palliative care patients (89%) were matched to 18,427 usual care patients, and of the 2388 palliative care patients who died, 2278 (95%) were matched to 2124 usual care patients. The palliative care patients who were discharged alive had an adjusted net savings of \$1696 in direct costs per admission ($p = .004$) and \$279 in direct costs per day ($p < .001$) including noteworthy reductions in laboratory and intensive care unit costs compared with usual care patients. The palliative care patients who expired had an adjusted net savings of \$4908 in direct costs per admission ($p = .003$) and \$374 in direct costs per day ($p < .001$) including significant decreases in pharmacy, laboratory, and intensive care unit costs compared with usual care patients. See Figure 5.

Figure 5: Mean Direct Cost for Patients

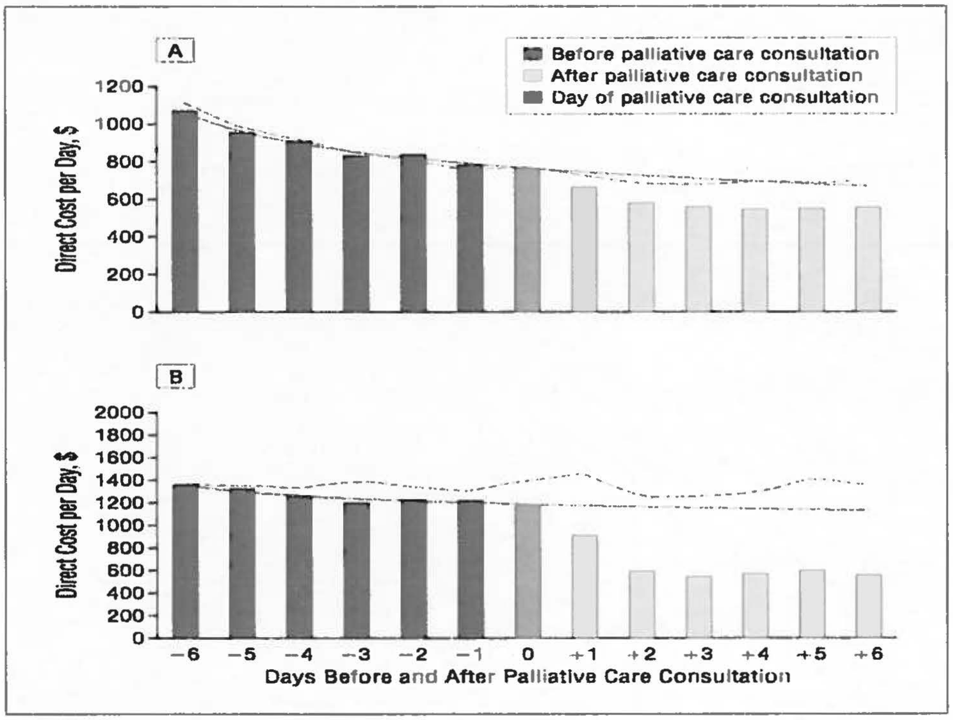


Figure Legend: Mean direct costs per day for palliative care patients who were discharged alive (A) or died (B) before and after palliative care consultation. The solid line represents the regression curve of actual costs before palliative care consultation (day 0) and estimated costs (days 1-6) assuming that palliative care consultation had not occurred. The dashed line represents direct costs per day for usual care patients for the 6 days before and after hospital day 6 (patients with lengths of stay of ≤10 days), hospital day 10 (for patients with lengths of stay of 11-20 days), or hospital day 18 (for patients with lengths of stay of >20 days).

Morrison et al. (2011) went on further to look at Medicaid patient data of four New York hospitals from 2004 to 2007. On average, patients who received palliative care incurred \$6,900 less in hospital costs during a given admission than a matched group of patients who received usual care. These reductions included \$4,098 in hospital costs per admission for patients discharged alive, and \$7,563 for patients who died in the hospital. Consistent with the objectives of patients and their families, palliative care recipients spent less time in intensive care, were less likely to die in intensive care units and were more likely to obtain hospice referrals than the matched usual care patients.

For many hospitals, patient and family satisfaction is a focus. There are several themes when measuring such satisfaction. Nelson et al. (2010) completed a study with nine focus groups, across three sites. One of the most common themes found among the participants was communication between clinicians and patients and their family members. The wife of a patient, who reported receiving frequent and effective communication in meetings that included the ICU physician, bedside nurse, and hospital chaplain, stated, “It’s very important that you know every day what is happening, because every day in an ICU is different.”

A second theme is self-efficacy. Self-efficacy can be defined as “the competence perceived by family members in participating in the care of the dying person.” In comparison to family members of usual care patients, family members of palliative care patients were more likely to report that they were fairly to very confident that they knew what to do when the patient died (usual care 64 [71%] vs. palliative care 46 [87%], $p = 0.03$). A trend was observed favoring palliative care in response to items querying whether families knew what to expect when the patient was dying (68% of usual care families felt very confident [n 55] vs. 82% of palliative care families [n 42], $p = 0.07$). Overall, palliative care showed significant benefit in the self-efficacy domain, with 52 (56%) of family members of usual care patients reporting that they were not confident in one or more of the above subdomains, as compared to 18 (33%) family members of palliative care patients ($p = 0.03$) (Gelfman, Meier, & Morrison, 2008).

Another concern regarding satisfactions is how staff relates to palliative care. A study was completed at a single hospital seeking to improve palliative care quality in the ICU. The study identified consecutive patients who died in the ICU (n = 253) before an intervention and post-intervention (n = 337). The intervention consisted of clinician education, local champions, academic detailing, feedback to clinicians, and system support. Using the Quality of Dying and Death (QODD) surveys and hierarchical linear modeling for the results showed an increase in nurse satisfaction (pre, 63.1; post, 67.1; $p < 0.01$) along with notable decrease in ICU days prior to death (pre, 7.2; post, 5.8; $p < 0.01$) (Curtis et al., 2008).

Enguidanos, Vesper, and Lorenz (2012) competed a retrospective cohort study to identify factors associated with hospital readmissions among seriously ill patients who received and inpatient palliative care consultation. Administrative data was collected utilizing medical service records. Additionally, records of pain at discharge and disposition at discharge were also collected. Disposition could include home with hospice care, nursing facility, home-based palliative care, home without home care services, and home with home health care. The difference between home with hospice and home with palliative care was the palliative care services were used if the patient was expected to live longer than a year and hospice was used if patients were expected to live less than six months. Descriptive analysis was used to describe the sample along with t tests and x^2 tests to compare characteristics of those who were not readmitted. Multiple hotdeck imputation was used for all variables with missing data. Logistic regression determined the factors associated with 30-day hospital readmission, adjusting for covariates. The results showed 484 patients aged 65 and over received IPC consults. Among these, 45 (9.3%) died during hospitalization, and 31 (6.4%) had missing medical service or disposition data, leaving 408 in the analytic sample. The mean age was 80.1 years (standard deviation [SD] = 8.2) and about half (48.5%) were female. The sample was diverse: 37.5% were white, 22.5% Latino, 20.3% black, 7.8% were of other ethnic background, and 11.8% had missing data. Cancer was the most common primary diagnoses (34.3%) followed by congestive heart failure (CHF) (16.4%), dementia (11.8%), coronary artery disease (11.8%), and chronic obstructive pulmonary disease (COPD). More than half (58.8%) were discharged to hospice, 14.7% to home-based palliative care, 14.2% to a nursing facility, 8.6% to home with no care, and 3.7% to home with home health. Nearly all (99.2%) admissions to hospice or home-based palliative care were new referrals.

Overall, 10.0% of those discharged from the hospital were readmitted within 30 days. Additionally, 30-day readmitted patients were more likely to have no emergency contact or a distant relative as an emergency contact. They also were more likely to be discharged without care at home or to a nursing facility. Among the 41 patients readmitted within 30 days, more than half (51%) were readmitted within 5 days and 78% were readmitted within 10 days of hospital discharge (Enguidanos et al., 2012).

With studies like the ones mentioned above, a greater appreciation for the benefits provided by inpatient palliative care consultations is developing. Providers should realize that an IPC coupled with a discharge for hospice or palliative care results in lower hospitalization readmission rates.

Alzheimer's Disease and Comorbidities

Palliative care for those with Alzheimer's disease is a growing concept. Most people think of cancer when palliative care is discussed. Most immediate causes of death recorded on autopsies are pneumonia, cardiovascular events and pulmonary embolism. Others can include cachexia and dehydration (Aminoff & Adunsky, 2004). Phelan, Borson, Grothaus, Balch, and Larson (2012) studied 494 patients with dementia. Of those, 427 (86%) were admitted to the hospital at least once for associated conditions. Among participants with dementia, the average annual admission rate was 419 admissions per 1000 persons, more than twice that of those without dementia, who averaged 200 admissions per 1000 persons each year (crude rate ratio, 2.10; 95% CI, 1.87- 2.35; $p < .001$). After age and sex adjustment, the ratio of admission rates was 1.57 (95% CI, 1.39-1.78; $p < .001$) and was 1.41 (95% CI, 1.23-1.61; $p < .001$) after adjusting for additional covariates.

Individuals with Alzheimer's disease are at an increased risk for under-treatment due to a lack of knowledge and respect for the disease process. It is often too complex and nuances of the condition are unknown to many who are responsible for treating the disease. Those with Alzheimer's, due to their comorbidities have greater and long-lasting burden with pain, anxiety, constipation, pressure sores, and restraints. Additionally the disease often causes behavioral changes, which prompt some health professionals interpret as behavioral symptoms of the disease or the person is "just being cranky" (Mahon & Sorrell, 2008).

Barriers to Implementation

There are several barriers to implementing palliative care in hospitals. First, there is lack of public awareness. If not educated on what palliative care entails, the public automatically equates it with a life-limiting concept. Medical centers need to educate patients, especially those with chronic complex conditions and comorbidities, that a palliative care service is available to them to assist in streamlining their care (Verret & Rohloff, 2013).

The second barrier is lack of understanding from medical care administrators. Some organizations think palliative care is just for end-of-life patients or a means to reduce length of stay. They do not understand how costs can be controlled by managing and coordinating care in the acute, inpatient, and outpatient settings. There needs to be further training on how palliative care can be achieved at all levels. Through this continuum of care, high patient satisfaction, better medical outcomes, and a reduced length of stay can all be achieved (Verret & Rohloff, 2013). Grudzen et al. (2013) looked at barriers in the emergency department and found one ED administrator who stated, “If you have this conversation right at the portal of entry and the person does get stabilized, how wonderful; or if the disease takes its natural progression, it'll be expected instead of the family thinking something was done wrong.”

The third barrier is acceptance from primary care physicians. Although each patient’s well-being is the focus of the primary care physician, often physicians simply cannot synchronize schedules to speak at length with all family members, guardians, or other physicians regarding vital care decisions. Palliative care teams offer a mechanism for introducing these conversations. However, from the primary physician’s point of view they are often seen as taking charge of the patient. Introducing the patient and family to the palliative care team should be viewed as an equivalent to referring the patient to a specialist (Verret & Rohloff, 2013). Gunvon, Gunten, and Weissman (2013) state, “although the focus of the consultation is a patient/family issue, your primary stakeholder is the attending physician who requested the consultation. Unhappy referring physicians mean fewer palliative care consultations!”

The fourth barrier is lack of standardization. Even though palliative care teams have grown, the effectiveness of their processes continues to lag. There is an absence of standardization in regards to structure, staffing, and policies. Many hospitals require a “pull” strategy where an order has to be written for a palliative care consult. Other facilities allow staff nurses to initiate a referral after a screening process has been completed. Most critical to standardization is the ability to move past internal politics that could obstruct streamlined integration with standard of care (Verret & Rohloff, 2013). Grudzen et al. (2013) found administrators suggested that hospitals adopt an algorithm or set of benchmarks to reduce variation in who receives palliative care interventions. An ED nursing director recommended creating “a system that sets a pathway for patients who present under a certain set of circumstances” so that a patient’s experience is not “random and variable.” Barriers specific to ED leadership include poor communication with patients and families, medico-legal concerns, and a lack of clear recommendations for forgoing care interventions or aggressive symptom management. Clear guidelines would help patients reach destinations, whether inpatient or outpatient, that are matched to their needs. This might also reduce medico-legal concerns if there are guidelines and processes for relinquishing aggressive interventions for patients who are unlikely to benefit.

Policy for the Future of Alzheimer’s

Change must happen in order for the battle to be won against Alzheimer’s disease. It will take effort from government officials, healthcare researchers and providers, and families of those who are stricken with the disease. Without all three groups of people working together, the struggles will continue for those who have Alzheimer’s.

Government Officials

Since the passage of NAPA, the current administration has done more to advance Alzheimer’s research than has any prior administration, as a result of both its implementation of the act and its reallocation of resources for Alzheimer’s research in fiscal years 2012 and 2013. Yet these accomplishments will not in and of themselves be sufficient to achieve the Alzheimer’s Study Group’s aim nor the national plan’s 2025 goal. Research in cognitive decline and brain health have led to a better understanding of Alzheimer’s and its progression, but identifying the underlying cause of the disease, effective treatments, and a cure requires further investment. The National Institutes of Health (NIH) has the ability to influence how much scientific research is directed at these questions through its funding decisions. Once new drugs or treatments are developed, the Food and Drug Administration (FDA) sets policies that dictate what type of data are needed to win regulatory approval (Bynum, 2014). These decisions must be expedited in order for us to gain control of this disease by 2025.

Clinical trials for Alzheimer's disease now target people before they develop overt disease, which makes the measurement of the treatment effect challenging. Recently, the FDA issued draft guidance to address this issue for newer studies of Alzheimer's disease therapies. In addition to research into the biology of Alzheimer's disease, there is also a need for ongoing research on how best to organize, deliver, and finance care in ways that provide the best quality of life possible for people affected by the disease (Bynum, 2014). Very soon phase III studies using drugs acting against amyloid deposition will be completed in patients with mild to moderate dementia due to AD. Although it is difficult to predict the outcomes, it is appropriate for this discussion to consider the issues possibly facing us if one of the treatments is effective to delay progression to moderate dementia, at least in a group of responders that can be defined using genotype (such as ApoE), age of onset of symptoms, and severity of dementia at time of treatment initiation (Gauthier, Leuzy, Racine, & Rosa-Neto, 2013).

Payment policy and regulatory functions in Medicare clearly have direct implications for people living with dementia, as they do for older adults with any disease. Some policies focus specifically on Alzheimer's disease and related dementias, such as eligibility criteria for entry into hospice and decisions guided by the Medicare Evidence Development and Coverage Advisory Committee about whether to cover new diagnostic imaging and testing technologies. The development of new payment strategies that create incentives for better care coordination and that reduce hospital readmissions is not specific to Alzheimer's disease and related dementias. Nonetheless, those strategies could have a large impact on people with dementia because they tend to have multiple chronic conditions and are at high risk of hospitalization (Bynum, 2014).

Healthcare Researchers and Providers

Festic, Wilson, Gajic, Divertie, and Rabatin (2012) conducted a study determining the different viewpoints of care providers. In order to implement change, we have to learn from our mistakes. Festic and colleagues identified five areas of difference between end-of-life care (EOLC) assessments of nurses and physicians. They found that nurses felt that they were unable to safely voice concerns regarding EOLC policies and practices, while physicians felt more comfortable in doing so. Additionally, they found that physicians were more likely to agree than nurses that appropriate and timely discussions regarding health care directives and do not resuscitate (DNR) orders were taking place. Physicians were more likely than nurses to agree that spiritual assessments were completed and that members of the medical team were aware of such assessments. Addressing spiritual needs is a core component of providing quality EOLC. Second, nurses often perceive that conflicting information and opinions are given to patients and their families by various physicians caring for the same patient. Third, a lack of communication may also contribute to dissatisfaction among nurses. Fourth, when presented with a patient scenario, ICU nurses seem to experience higher levels of moral stress as compared to physicians. In one study, 45% of nurses considered leaving a position secondary to moral stress, compared to only 3% of physicians. Nurses also spend more time with patients and may be more acutely aware of suffering. Lastly, there are further contributing factors that may include differences in authority, education, and work philosophies. Each of these causes of discrepancy represents an opportunity for intervention. Additional outcomes such as poor comprehension, anxiety and depression have been reported when successful physician and nurse collaboration are absent.

Education should include families of patients with Alzheimer's disease and the wider community: physicians, hospital staff, long- term care professionals, and hospice staff. The themes for the education should include general knowledge about severe dementia and recognition of advanced AD as a terminal condition. Improved awareness of the social support provided to the families during a residential hospice stay and during bereavement is needed. Hospice staff training is necessary in regards to the unique needs of individuals with AD including how to communicate and how to manage behavioral symptoms of dementia. Overall public education on the terminality of AD and the benefits of hospice care need to continue to be encouraged from both the Alzheimer's Association and hospice agencies (McCarty & Volicer, 2009).

Families and Friends

Unfortunately, patients with dementia are at particular risk for receiving poor end-of-life care for a variety of reasons. A primary factor is that few patients with dementia are ever enrolled in hospice care, the dominant model of providing superb end-of-life care in this country. Few patients enrolled in hospice have a primary diagnosis of dementia. Underutilization of referral to hospice for these patients may be related to a lack of recognition of dementia as a terminal disease, and the difficulty in quantifying a prognosis of six months or less. To combat this dire statistic, The University of Chicago developed the Palliative Excellence in Alzheimer Care Efforts (PEACE) program. It attempts to integrate palliative care into the primary care of patients with dementia throughout the course of the illness. This program essentially demonstrates a disease management model for dementia that incorporates advance planning, patient-centered care, family support, and a palliative care focus from the diagnosis of dementia through its terminal stages. In addition, in the advanced stages of the disease, the PEACE program strives to ensure that all patients and families are offered hospice care, that patients die in their desired location (usually at home), and that they do not undergo undesired invasive procedures or hospitalizations (Shega et al., 2003). This program needs to serve as a model and be implemented in all communities to better serve those who have Alzheimer's. A possible solution would be to have each local Alzheimer's Association chapter spearhead the PEACE program in their community.

For Further Research

End of life care is an increasingly important health care issue, and represents a significant burden of costs to the society. Palliative care provides a counterintuitive attitude to the high-tech American model of health care. Nevertheless, current limited data shows that investing in palliative care makes more sense both ethically and financially. What is surprising, unfortunately, is the lack of public understanding and emphasis on palliative care, the gaps in implementing what is cost-effective in end of life care, and in training palliative care professionals, and the vast deficits in palliative care research support to find effective solutions (Yang & Mahon, 2012).

Definitions, methods, and measurement strategies vary across studies limiting our ability to address sources of fault. We must therefore address methodological vulnerabilities and develop a foundation of meticulous research that adds to the evidence base and helps enhance patient and family outcomes during the receipt of palliative and end-of-life care. Longitudinal, prospective, theoretically driven designs offer opportunities to consider causal mechanisms and explore mediators, confounders, and interaction effects. We also must avoid unclear definitions, better assess health disparities, and use theoretical frameworks. Comparative effectiveness and cost-effectiveness studies, and those that address topics such as advanced care planning, pediatric issues, and ethno-culturally diverse populations must also be conducted utilizing the best methodology possible (Aziz, Miller, & Curtis, 2012).

METHODOLOGY

Study Design and Hypothesis

We conducted a retrospective archival inception cohort study using hospital administrative claims data from the state of Florida for the calendar year of 2012. The study design was approved by the Medical University of South Carolina Institutional Review Board as an exempt activity of human subjects research.

We selected only acute care patients in Florida with a diagnosis of Alzheimer's disease or dementia who were hospitalized for either the dementia condition or because of acute urinary tract infection (UTI), pneumonia, congestive heart failure (CHF). This limitation in primary reasons for hospital admission allowed us to examine the effect of the palliative care consult for a homogenous group of patients who would be expected to be at similar risk of readmission at 30 days.

In the present study, two hypotheses will be examined. They are described below.

Hypothesis 1: **Inpatient Palliative Consultations will reduce hospital readmissions for patients who are suffering from Alzheimer's disease and dementia.** This study will show the benefit of utilizing IPCs in regards to costs, lengths of stay for initial admissions, and reductions in re-admissions.

Hypothesis 2: **This study will show the effect of the inpatient palliative care consultations has on reducing re-hospitalization is reduced as the number of comorbidities increases.**

Population and Sample

For the data used in the present study, the original population consisted of 53,574 admissions of patients with Alzheimer's disease from January 1, 2012 through December 21, 2012 to any Florida hospital. Readmissions from all causes within 30 days were 8009. Of the initial 53,574 admissions, 2,238 had palliative care consultations, which is a focal aspect of the proposed study.

Definition of Variables

In addition to demographic variables, there will be seven measured variables in the present study. Each is described below.

Demographics. Sex will be coded 0 for males and 1 for females. Race will be coded 0 for Whites, 1 for Blacks, 2 for Hispanic, and 3 for others.

Admission. Admission was characterized by the index hospitalization for a person diagnosed with Alzheimer's disease using ICD-9 code 331.0 or dementia using ICD-9 code 290.xx.

Readmission. Hospital readmissions will be the focal dependent variable. Hospital readmission is defined as an admission into the hospital 30 days from the index hospitalization date. Thus, this variable is binary and will be coded as 1 = Yes and 0 = No.

Palliative care. The main independent variable will be the Inpatient Palliative Care consultation code. For those who had the IPC code of V66.7, a 1 will be entered in the data set. For those who did not receive an IPC, a 0 will be entered. While the intensity of the consultation cannot be determined by this value, it does constitute a change in care process.

Hospice Care. Hospice care is defined as patients who received or did not receive a referral to hospice care. Those who received a referral will be assigned the value of 1. For those who did not receive a referral, there value will be 0.

Reason for Admission. This variable will index the number of diagnoses for which the patient was admitted. Although 11 possible diagnoses will be coded (see below), some overlap, resulting in nine unique codes. Because the reason for admission variable will be a sum, this variable will range between 1 and 9 where 1 indicates one diagnosis while 9 indicates that a patient was admitted based on all 9 diagnoses. The possible diagnoses coded are:

331.0 – Alzheimer's disease
290.xx – Dementia
428.0 – Congestive Heart Failure
487.0 – Influenza with pneumonia
482.83 – Pneumonia due to other gram-negative organisms
481 – Pneumococcal pneumonia
486 – Generic bacterial pneumonia
595.4 – Cystitis in diseases classified elsewhere
595.0 – Acute Cystitis
595 – Cystitis
599.0 – Urinary tract infections

Payer Source. The source of the payer will take one of three values. Medicare will be coded as 0, Medicaid will be coded as 1, and Commercial Insurance would be coded as 2.

Length of stay (LOS). Length of stay will be defined as the number of days the patient was in the hospital from admission to discharge.

Data Collection

Information was retrieved from the public use data sets from the Healthcare Cost and Utilization Project (HCUP) provided by the Agency for Healthcare Research and Quality (AHRQ) specifically for the state of Florida from 2012. Unlike most other states, Florida was selected because they are able to link subsequent admissions back to initial admissions using patient identification numbers. Daiello, Gardner, Epstein-Lubow, Butterfield, and Gravenstein (2014) in their study of Alzheimer's readmission rates uses Rhode Island data for the same reason. Only few states provide the linkage between initial admission and readmission data.

Analysis

Data set construction and analyses were performed using SAS v 9.3. Mean values and percentages were used for description of our population. We tested differences between groups using chi-square, *t*-test, or non-parametric statistics as appropriate. Multivariable modeling was performed using logistic regression. We controlled for differences in patient characteristics; including principal diagnosis and other variable that were significantly different in the univariate comparisons. We first fitted a complete model using all control variables. Then we removed the non-significant predictors one at a time and re-estimated the model until the model diagnostics were optimal.

RESULTS

There were a number of patient characteristics that did not differ significantly between palliative care patients and non-palliative care patients (see Table 1). They were similar in their gender and race distributions as well as the average number of chronic conditions. However, those who received palliative care were significantly older (85.9 vs. 83.5 years $p < .0001$) than those who did not receive palliative care. In addition, although patients were more likely to be on

Medicare than other forms of insurance, those without palliative care were almost entirely on Medicare (94.7%) compared to those with palliative care (76.5%) and this association was statistically significant ($p < .0001$).

Regarding other characteristics, it deserves noting that dementia type was also associated with whether a patient received or did not receive palliative care. More specifically, a slightly larger percentage of palliative care patients had Alzheimer's (82.1%) compared to non-palliative care patients (77.0% $p = .0173$). We also found a different distribution of index admission principal diagnosis for patients who received palliative care. In particular, palliative care patients had more admissions for pneumonia and sepsis while non-palliative care patients were more often admitted for urinary tract infection or pneumonia ($p < .0001$). There were substantial differences in discharge destination between groups. Patient without palliative care were more often discharged to a nursing home (47.2%) or home (32.9%) while those with palliative care consults tended to be discharged to a hospice (55.2%) or other setting (28.4%) ($p <.0001$). As expected, length of stay was significantly shorter for palliative care patients (5.3 vs. 6.8 days $p < .0001$) and cost was also substantially lower for palliative care patients ($8,385 vs. $9,401 $p < .0001$) than for non-palliative care patients.

Table 1: Patient Characteristics at the Index Admission

Variable Names	Patients with a Palliative Care Code *N* = 408	Patients without Palliative Care *N* = 6900	Statistic	Total Population *N* = 7308
Patient Characteristics:				
Mean age (SD)	85.9 (8.2)	83.5 (8.3)	<.0001	83.6 (8.27)
Percent Female	60.5%	59.5%	.8285	59.5%
Percent White	69.6%	68.1%	.5138	68.2%
Percent Black	7.8%	9.9%	.1830	9.7%
Percent Other Race	22.6%	22.1%	.8270	22.1%
Mean (SD) Number of Chronic conditions noted	7.0 (3.6)	7.2 (3.3)	.2615	7.2 (3.4)

on record				
Insurance:				
Medicare	76.5%	94.7%	<.0001	93.7%
Medicaid	0.3%	1.6%		1.6%
Commercial Insurance	9.8%	2.3%		2.7%
Other Payers	13.5%	1.4%		2.0%
Dementia Type:				
Alzheimer's	82.1%	77.0%	.0173	77.3%
Dementia	17.9%	23.0		22.7%
Index Admission Principal Diagnosis:				
Urinary Tract Infection	13.7%	31.5%	<.0001	30.5%
Pneumonia	29.9%	29.0%		29.0%
Sepsis	29.4%	16.1%		16.9%
Congestive Heart Failure	9.3%	11.7%		11.5%
Alzheimer's or Dementia	17.7%	11.7%		12.1%
Discharge Destination:				
Discharged to Home	4.4%	32.9%	<.0001	31.3%
Discharged to Hospice	55.2%	9.3%		11.9%
Discharged To Nursing home	12.0%	47.2%		45.2%
Discharged to other settings	28.4%	10.6%		11.6%
Percent with Palliative Care Consult	100%	0%	NA	5.58%
LOS on Index Admission	5.3 (4.7)	6.8 (7.7)	<.0001	6.7 (7.5)
Cost of Index Admission	$8,385 ($9,809)	$6,401 ($11,354)	.0447	$9,344 ($11,275)

Of the 7308 patients in our study, 1266 (17.3%) were readmitted within 30 days (see Table 2). However, only 1.9% of the readmitted patients had received an IPC during the index admission.

Readmitted patients were, on average, younger (82.6 year vs. 83.8 years *p* < .0001) patients who were not readmitted. Of those who were readmitted, 64.5% were white, which was significantly less than the 68.9% who were white and not readmitted (*p* = .0024). Notably, of those who were readmitted, 11.4% were black, which was significantly greater than the 9.4% who were black and not readmitted (*p* = .0313). In addition, of those who were readmitted, 24.9% were non-black minorities compared to 21.7% who were not readmitted. As expected, those were readmitted also tended to have a greater average number of chronic conditions (7.8 vs. 7.1 $p < .0001$) compared to those were not readmitted. The type of insurance was also associated with readmission status with Medicare and Medicaid insurance coverage was more prevalent for those who are readmitted compared to those who are not readmitted ($p = .0079$). In summary, those who were readmitted within 30 days were less likely to have received a palliative care consult, were younger, more likely to be black or some other minority race, and have a larger average number of chronic conditions.

Table 2: Characteristics of Patients by Readmission at 30 Days

Variable Names	Readmitted by 30 Days Patients *N* = 1266	No Readmission *N* = 6042	Statistic
Percent with Palliative Care Consult	1.9%	6.4%	<.0001
Patient Characteristics:			
Mean age (SD)	82.6 (8.9)	83.8 (8.1)	<.0001
Percent Female	57.7	59.9	.1348
Percent White	64.5	68.9	.0024
Percent Black	11.4	9.4	.0313
Percent Other Race	24.9	21.7	.0062
Mean (SD) Number of Chronic conditions noted on record	7.8 (3.4)	7.1 (3.6)	<.0001
Insurance:			
Medicare	94.2	93.6	.0079
Medicaid	2.3	1.4	
Commercial Insurance	2.3	2.8	
Other Payers	1.2	2.2	
Dementia Type:			
Alzheimer's	71.9	76.2	.0012
Dementia	28.1	23.8	
Index Admission Principal Diagnosis:			
Urinary Tract Infection	30.9	30.4	<.0001
Pneumonia	28.0	29.3	
Sepsis	14.7	17.4	
Congestive Heart Failure	16.0	10.6	

Alzheimer's or Dementia	10.4	12.4	
Discharge Destination:			
Discharged to Home	33.1	30.9	<.0001
Discharged to Hospice	2.7	13.8	
Discharged To Nursing home	56.6	42.8	
Discharged to other settings	7.6	12.5	
Index Admission Resources:			
LOS on Index Admission	8.4 (11.2)	6.3 (6.4)	<.0001
Cost of Index Admission	\$11,396 (\$10,584)	\$8,915 (\$8,653)	<.0001

There were additional differences between the readmitted patient group and those not readmitted within 30 days. The readmission group had a low proportion of patient with Alzheimer's disease (71.9% vs. 76.2% $p = .0012$) than patients who were not readmitted. In addition, patients with an index diagnosis of congestive heart failure were much more likely to be readmitted than patients with other index diagnoses ($p < .0001$). The discharge destination for the Index admission also affects the risk of readmission within 30 days. Patients who were originally discharged to home or a nursing home were more frequently readmitted than patients who were discharges to hospice or other sites ($p < .0001$). Patients with a longer LOS during the Index admission were also more likely to be readmitted than patients with a low LOS. The average LOS at the original admission for those were readmitted was 8.4 days compared to 6.4 days for those who were not readmitted ($p < .0001$). The average cost was \$11,396 vs. \$8,915 ($p < .0001$).

These descriptive statistics indicate that the characteristics of patients who were readmitted differ greatly, both in terms of their use of IPC and by many other factors. To clarify the contribution of IPC to the reduction of readmissions, we used multivariable modeling to examine the effect of IPC on readmission risk controlling for all the characteristics shown above. The results of the multivariable modeling are provided in Table 3.

We examined the ability of having a recorded palliative care consult recorded from the hospital discharge summary on the risk of readmission within 30 days for our patient cohort using logistic regression modeling of readmissions within 30 days (readmission = 1, no readmission = 0). The results of the comprehensive multivariable model (Model 1) and best fitting model (Model 2) are provided in Table 3. The most parsimonious model is discussed below.

The overall fit of the reduced model was statistically significant ($p < .0001$). The estimated odds ratio (OR) for palliative care was 0.56, indicating that patients who receive palliative care are about 44% less likely to be readmitted. Several variables were shown to affect risk of readmission in the model. Readmission risk decreased for older patients. For each additional year in age, the odds of being readmitted decreases by 1.3%. Hispanic patients were at about 22% greater risk than either Caucasian or African American patients with and OR of 1.22. Being discharged to a nursing home at the end of the Index admission increased the risk of readmission by 39% (OR = 1.39), while discharge hospice decreased readmission risk by 76% (OR = 0.24) compared to patients who were discharge to home or to other settings. Patients who were hospitalized for CHF during the Index admission had 54% greater risk of a readmission within 30 days, than observed for patients with any of the other diagnoses (OR 1.54). As we expected, patients with a greater number of chronic conditions were at greater risk of readmission. For a one unit increase in the number of chronic conditions recorded, the odds of being readmitted increases by 4.2%. LOS for the Index admission was also a predictor of increased risk of readmission, for a one-unit increase in the LOS, the odds of being readmitted increase by 2.6% (OR = 1.026).

Table 3: Multivariable Logistic Regression Models Predicting Readmission at 30 Days

Variable Names	Model 1: OR All Variables Readmitted by 30 Days	Model 2: OR Only Significant Variables Retained Readmitted by 30 days	Model 2: 95% OR Confidence Interval
No Palliative Care Consult reference			
Palliative Care Consult	0.697	0.557	0.362-0.858
Patient Characteristics:			
Age in years	0.989	0.987	0.980-0.995
Male reference			
Female	0.935		
White reference			
Black	1.144		
Hispanic	1.247	1.220	1.053-1.413
Number of Chronic conditions noted on record	1.039	1.038	1.018-1.058
Insurance:			
Medicare	1.078		
Medicaid	1.346		
Commercial Insurance	1.212		
Other Payers Reference			
Index Admission Principal Diagnosis:			
Urinary Tract Infection reference			
Pneumonia	0.956		
Sepsis	0.854		
Congestive Heart Failure	1.407	1.527	1.270-1.836
Alzheimer's or Dementia	0.851		
Discharge Destination:			
Discharged to Home	1.894		
Discharged to Hospice	0.379	0.235	0.164-0.338
Discharged To Nursing home	2.292	1.392	1.225-1.583
Discharged to other settings reference			
Index Admission Resources:			
LOS on Index Admission	1.029	1.026	1.016-1.035

DISCUSSION

This study examined readmission rates specifically for those individuals with Alzheimer's disease or dementia that also had an IPC. Due to recent healthcare legislations and penalties assessed by Medicare on hospital readmission rates, this study was necessary. Daiello, Gardner, Epstein-Lubow, Butterfield, and Gravenstein (2014) examined patients specifically readmitted with Alzheimer's and found an alarming readmission rate of 17.8%. Other researchers like Gaertner et al. (2013), Cheng, Dy, Fang, Chen, and Chiu (2013), Armstrong, Jenigiri, Hutson, Wachs, and Lambe (2013) have studied the effects of IPCs on hospital readmission rates, typically for those with cancer. However, to our knowledge, this is the first article that brings IPCs and Alzheimer's together. While the results showing the effectiveness of having inpatient palliative care consultations as part of the process of care for those with Alzheimer's, further research needs to be completed. Specifically, education for hospital staff on palliative care screening, education for family members on the progression of Alzheimer's disease, and better resources in the planning for transitions in care as a patient's needs change.

LIMITATIONS

Although the findings of this study were consistent with predictions based on the literature, there were limitations. The accuracy of coding diagnosis and documentation of the palliative care consultation may not be consistent across hospitals. Only one year of data was analyzed in one state. Perhaps to make this study more generalizable, more years and different states could be included in future studies. Finally, the depth of the inpatient palliative care consultation cannot be determined, only that a change in the process of care occurred. Rural hospitals may have a different palliative care program than academic teaching hospitals. Through this research, we are unable to determine the depth or breadth of the IPC.

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The Effect of Inpatient Palliative Care Consultations on Hospital Readmission Rates for Patients with a Diagnosis of Alzheimer's Disease or Dementia

ABSTRACT

Background: Evidence suggests that inpatient palliative care consultation (IPC) services reduce the likelihood of hospital readmissions for those with Alzheimer's disease and dementia.

Objective: This study examines the difference in readmission rates for Alzheimer's patients with and without inpatient palliative care consultations.

Design: This is a retrospective study using an inception cohort derived from HCUP archival data from the state of Florida for the year 2012. Only acute care patients with a diagnosis of Alzheimer's disease or dementia who were hospitalized for either the dementia condition or because of acute urinary tract infection (UTI), pneumonia, or congestive heart failure (CHF) were included in this study.

Methods: Analyses were performed using SAS v 9.3. Mean values and percentages were used for description. Differences between groups were tested using chi-square, *t*-tests, or non-parametric statistics as appropriate. Multivariable modeling was performed using logistic regression.

Results: Of the 7,308 patients in our study, 1,266 (17.3%) were readmitted within 30 days. However, only 1.9% of the readmitted patients received an IPC during the index admission.

Conclusions: Inpatient palliative care consultations do positively affect the hospital readmissions rates for those with Alzheimer's and dementia.

INTRODUCTION

We are an aging nation. The number of Baby Boomers, those born between 1946 and 1964, are now utilizing our health care system more than ever. Many are doing so with a chronic illness such as dementia, or more specifically, Alzheimer's disease. The United States spends more per capita than any country on healthcare, yet the quality of care is often fragmented with very little communication and tremendous strains on family caregivers. To combat costs and improve patient satisfaction, hospitals have been implementing palliative care programs with specialists who can assist patients to navigate their disease trajectory. Unfortunately, those who are functionally and mentally impaired must circumnavigate among care providers who have vastly different objectives, workforce abilities, and quality and payment incentive models.

Historically, palliative care was only offered to patients with a cancer diagnosis. However, its use has now expanded to all patients with a chronic or incurable diagnosis (Bush & Shahwan-Akl, 2013) including those who have been diagnosed with Alzheimer's disease or other dementias. An inpatient palliative care consultation (IPC), like other specialist consultation, is typically initiated at the request of the treating physician. IPC teams communicate their recommendations back to the referring physician for implementation. Additionally, palliative teams focus on clarifying diagnoses and treatment options, helping patients and family members identify goals of care, and helping them select, in conjunction with their treating physicians, the treatments and hospital discharge options that meet those goals (Morrison et al., 2011).

Alzheimer's disease is recognized as the leading cause of dementia, and is a chronic degenerative progressive disease. Along with the other dementias, disease progression in the moderate-to-severe stages share a common clinical pathway, being that ultimately admission to a specialty dementia unit, nursing home, or an acute general hospital may happen for a multitude of reasons (Coleman, 2012). Earlier recognition of dementia patients and subsequent IPCs are needed to better manage predictable complications and relieve overall suffering. In particular, IPC services can help diagnose dementia, create an opportunity to conduct well-informed goals of care discussions, provide guidance in understanding prognosis, manage patients' distressful symptoms, provide emotional, spiritual, and social support for the patient and caregivers, and explore the services available at home to improve access to care upon hospital discharge (Ouchi et al., 2014).

Palliative care for those with Alzheimer's disease is a growing practice trend.. Most immediate causes of death recorded on autopsies are pneumonia, cardiovascular events and pulmonary embolism. Others can include cachexia and dehydration (Aminoff & Adunsky, 2004). Phelan, Borson, Grothaus, Balch, and Larson (2012) studied 494 patients with dementia. Of those, 427 (86%) were admitted to the hospital at least once for associated conditions. Among participants with dementia, the average annual admission rate was 419 admissions per 1000 persons, more than twice that of those without dementia, who averaged 200 admissions per 1000 persons each year (crude rate ratio, 2.10; 95% CI, 1.87- 2.35; $p < .001$). After age and sex adjustment, the ratio of admission rates was 1.57 (95% CI, 1.39-1.78; $p < .001$) and was 1.41 (95% CI, 1.23-1.61; $p < .001$) after adjusting for additional covariates.

Individuals with Alzheimer's disease are at an increased risk for under-treatment due to a lack of knowledge and respect for the disease process. It is often too complex and nuances of the condition are unknown to many who are responsible for treating the disease. Those with Alzheimer's, due to their comorbidities have greater and long-lasting burden with pain, anxiety, constipation, pressure sores, and restraints. Additionally the disease often causes behavioral changes, which prompt some health professionals to interpret as behavioral symptoms of the disease or the person is "just being cranky" (Mahon & Sorrell, 2008)

While there is ample research on Alzheimer's disease and growing evidence of palliative care being utilized in the hospital setting, little research has been conducted on how IPCs affect the readmission of those with this disease. Based upon these facts we hypothesized that IPCs will reduce hospital readmission rates for those that have Alzheimer's disease.

METHODS

We conducted a retrospective archival inception cohort study using hospital administrative claims data from the state of Florida for the calendar year of 2012. The study design was approved by the Medical University of South Carolina Institutional Review Board as an exempt activity of human subjects research.

Setting and Study Population

We selected only acute care patients in Florida with a diagnosis of Alzheimer's disease or dementia who were hospitalized for either the dementia condition or because of acute urinary tract infection (UTI), pneumonia, or congestive heart failure (CHF). This limitation in primary reasons for hospital admission allowed us to examine the effect of the palliative care consult for a homogenous group of patients who would be expected to be at similar risk of readmission at 30 days.

Data

The Healthcare Cost and Utilization Project data for 2012 for the state of Florida was selected because this data set allows us to link patient admissions over time to identify readmissions. All hospital admissions for patients with an ICD-9 code for a principal diagnosis of Alzheimer's disease (331.0) or dementia (290.x), or with a comorbid diagnosis code of dementia or Alzheimer's disease and a principal diagnosis code for urinary tract infection (595.x, 559.0, 595.0, 595.4), pneumonia (486.x, 481.x, 487.0, 482.83), or congestive heart failure (428.0) were extracted. For patients with more than one admission, the first hospital admission in the year for each patient was used as the index admission. Patients were linked to all subsequent hospital admissions for that year, and patients with an admission within 30 days of the date of discharge from their index admission were assigned a value of 1 on the readmission variable. Patients without a readmission within 30 of discharge form the index admission were assigned a value of 0. Variables were created from the index admission record to denote insurance coverage, age, sex, racial group, length of stay (LOS) and binary variables indicating discharge to home, nursing home hospice or other discharge destination. Patients with a code of V66.7 were assigned a value of 1 for inpatient palliative care consultation (IPC), patients without this code were set at IPC = 0. The recorded number of chronic condition codes on the index discharge record were used as an indicator of the patients comorbidity burden, and LOS was used as an indicator of severity of the index admission.

Analysis

Data set construction and analyses were performed using SAS v 9.3. Mean values and percentages were used for description of our population. We tested differences between groups using chi-square, *t*-test, or non-parametric statistics as appropriate. Multivariable modeling was performed using logistic regression. We controlled for differences in patient characteristics; including principal diagnosis and other variable that were significantly different in the univariate comparisons. We first fitted a complete model using all control variables. Then we removed the non-significant predictors one at a time and re-estimated the model until the model diagnostics were optimal.

RESULTS

There were a number of patient characteristics that did not differ significantly between palliative care patients and non-palliative care patients (see Table 1). They were similar in their gender and race distributions as well as the average number of chronic conditions. However, those who received palliative care were significantly older (85.9 vs. 83.5 years $p < .0001$) than those who did not receive palliative care . In addition, although patients were more likely to be on Medicare than other forms of insurance, those without palliative care were almost entirely on Medicare (94.7%) compared to those with palliative care (76.5%) and this association was statistically significant ($p < .0001$).

Regarding other characteristics, it deserves noting that dementia type was also associated with whether a patient received or did not receive palliative care. More specifically, a slightly larger percentage of palliative care patients had Alzheimer's (82.1%) compared to non-palliative care patients (77.0% $p = .0173$). We also found a different distribution of index admission principal diagnosis for patients who received palliative care. In particular, palliative care patients had more admissions for pneumonia and sepsis while non-palliative care patients were more often admitted for urinary tract infection or pneumonia ($p < .0001$). There were substantial differences in discharge destination between groups. Patient without palliative care were more often discharged to a nursing home (47.2%) or home (32.9%) while those with palliative care consults tended to be discharged to a hospice (55.2%) or other setting (28.4%) ($p <.0001$). As expected, length of stay was significantly shorter for palliative care patients (5.3 vs. 6.8 days $p < .0001$) and cost was also substantially lower for palliative care patients ($8,385 vs. $9,401 $p < .0001$) than for non-palliative care patients.

Of the 7308 patients in our study, 1266 (17.3%) were readmitted within 30 days (see Table 2). However, only 1.9% of the readmitted patients had received an IPC during the index admission.

Readmitted patients were, on average, younger (82.6 year vs. 83.8 years $p < .0001$) than patients who were not readmitted. Of those who were readmitted, 64.5% were white, which was significantly less than the 68.9% who were white and not readmitted ($p = .0024$). Notably, of those who were readmitted, 11.4% were black, which was significantly greater than the 9.4% who were black and not readmitted ($p = .0313$). In addition, of those who were readmitted, 24.9% were non-black minorities compared to 21.7% who were not readmitted. As expected, those were readmitted also tended to have a greater average number of chronic conditions (7.8 vs. 7.1 $p < .0001$) compared to those were not readmitted. The type of insurance was also associated with readmission status with Medicare and Medicaid insurance coverage was more prevalent for those who are readmitted compared to those who are not readmitted ($p = .0079$). In summary, those who were readmitted within 30 days were less likely to have received a palliative care consult, were younger, more likely to be black or some other minority race, and have a larger average number of chronic conditions.

There were additional differences between the readmitted patient group and those not readmitted within 30 days. The readmission group had a lower proportion of patients with Alzheimer's disease (71.9% vs. 76.2% $p = .0012$) than patients who were not readmitted. In addition, patients with an index diagnosis of congestive heart failure were much more likely to be readmitted than patients with other index diagnoses ($p < .0001$). The discharge destination for the index admission also affects the risk of readmission within 30 days. Patients who were originally discharged to home or a nursing home were more frequently readmitted than patients who were discharges to hospice or other sites ($p < .0001$). Patients with a longer LOS during the index admission were also more likely to be readmitted than patients with a low LOS. The average LOS at the original admission for those were readmitted was 8.4 days compared to 6.4 days for those who were not readmitted ($p < .0001$). The average cost was $11,396 vs. $8,915 ($p < .0001$).

These descriptive statistics indicate that the characteristics of patients who were readmitted differ greatly, both in terms of their use of IPC and by many other factors. To clarify the contribution of IPC to the reduction of readmissions, we used multivariate modeling to examine the effect of IPC on readmission risk controlling for all the characteristics shown above. The results of the multivariable modeling are provided in Table 3.

We examined the ability of having a recorded palliative care consult recorded from the hospital discharge summary on the risk of readmission within 30 days for our patient cohort using logistic regression modeling of readmissions within 30 days (readmission = 1, no readmission = 0). The results of the comprehensive multivariable model (Model 1) and best fitting model (Model 2) are provided in Table 3. The most parsimonious model is discussed below.

The overall fit of the reduced model was statistically significant ($p < .0001$). The estimated odds ratio (OR) for palliative care was 0.56, indicating that patients who receive palliative care are about 44% less likely to be readmitted. Several variables were shown to affect risk of readmission in the model. Readmission risk decreased for older patients. For each additional year in age, the odds of being readmitted decreases by 1.3%. Hispanic patients were at about 22% greater risk than either Caucasian or African American patients with and OR of 1.22. Being discharged to a nursing home at the end of the index admission increased the risk of readmission by 39% (OR = 1.39). Being discharged to hospice decreased the readmission risk by 76% (OR = 0.24) compared to patients who were discharged to home or other settings. Patients who were hospitalized for CHF during the index admission had 54% greater risk of a readmission within 30 days than observed for patients with any other diagnoses (OR 1.54). As we expected, patients with a greater number of chronic conditions were at greater risk of readmission. For a one unit increase in the number of chronic conditions recorded, the odds of being readmitted increases by 4.2%. LOS for the index admission was also a predictor of increased risk of readmission. For a one-unit increase in the LOS, the odds of being readmitted increased by 2.6% (OR = 1.026).

DISCUSSION

This study examined readmission rates specifically for those individuals with Alzheimer's disease or dementia that also had an IPC. Due to recent healthcare legislations and penalties assessed by Medicare on hospital readmission rates, this study was necessary. Daiello, Gardner, Epstein-Lubow, Butterfield, and Gravenstein (2014) examined patients specifically readmitted with Alzheimer's and found an alarming readmission rate of 17.8%. Other researchers like Gaertner et al. (2013), Cheng, Dy, Fang, Chen, and Chiu (2013), Armstrong, Jenigiri, Hutson, Wachs, and Lambe (2013) have studied the effects of IPCs on hospital readmission rates, typically for those with cancer. However, to our knowledge, this is the first article that brings IPCs and Alzheimer's together. While the results showing the effectiveness of having inpatient palliative care consultations as part of the process of care for those with Alzheimer's, further research needs to be completed. Specific foci for this research include education for hospital staff on palliative care screening, education for family members on the progression of Alzheimer's disease, and better resources in the planning for transitions in care as a patient's needs change.

LIMITATIONS

Although the findings of this study were consistent with predictions based on the literature, there were limitations. The accuracy of coding diagnosis and documentation of the palliative care consultation may not be consistent across hospitals. Only one year of data was analyzed in one state. Perhaps to make this study more generalizable, more years and different states could be included in future studies. Finally, the depth of the inpatient palliative care consultation cannot be determined, only that a change in the process of care occurred. Rural hospitals may have a different palliative care program than academic teaching hospitals. Through this research, we are unable to determine the depth or breadth of the IPC.

CONCLUSIONS

These findings suggest that IPCs do affect the readmission rate for those diagnosed with Alzheimer's disease and other dementias.

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Table 1: Patient Characteristics at the Index Admission

Variable Names	Patients with a Palliative Care Code *N* = 408	Patients without Palliative Care *N* = 6900	Statistic	Total Population *N* = 7308
Patient Characteristics:				
Mean age (SD)	85.9 (8.2)	83.5 (8.3)	<.0001	83.6 (8.27)
Percent Female	60.5%	59.5%	.8285	59.5%
Percent White	69.6%	68.1%	.5138	68.2%
Percent Black	7.8%	9.9%	.1830	9.7%
Percent Other Race	22.6%	22.1%	.8270	22.1%
Mean (SD) Number of Chronic conditions noted on record	7.0 (3.6)	7.2 (3.3)	.2615	7.2 (3.4)
Insurance:				
Medicare	76.5%	94.7%	<.0001	93.7%
Medicaid	0.3%	1.6%		1.6%
Commercial Insurance	9.8%	2.3%		2.7%
Other Payers	13.5%	1.4%		2.0%
Dementia Type:				
Alzheimer's	82.1%	77.0%	.0173	77.3%
Dementia	17.9%	23.0		22.7%
Index Admission Principal Diagnosis:				
Urinary Tract Infection	13.7%	31.5%	<.0001	30.5%
Pneumonia	29.9%	29.0%		29.0%
Sepsis	29.4%	16.1%		16.9%
Congestive Heart Failure	9.3%	11.7%		11.5%
Alzheimer's or Dementia	17.7%	11.7%		12.1%
Discharge Destination:				
Discharged to Home	4.4%	32.9%	<.0001	31.3%
Discharged to Hospice	55.2%	9.3%		11.9%
Discharged To Nursing home	12.0%	47.2%		45.2%
Discharged to other settings	28.4%	10.6%		11.6%
Percent with Palliative Care Consult	100%	0%	NA	5.58%
LOS on Index Admission	5.3 (4.7)	6.8 (7.7)	<.0001	6.7 (7.5)
Cost of Index Admission	$8,385 ($9,809)	$6,401 ($11,354)	.0447	$9,344 ($11,275)

Table 2: Characteristics of Patients by Readmission at 30 Days

Variable Names	Readmitted by 30 Days Patients *N* = 1266	No Readmission *N* = 6042	Statistic
Percent with Palliative Care Consult	1.9%	6.4%	<.0001
Patient Characteristics:			
Mean age (SD)	82.6 (8.9)	83.8 (8.1)	<.0001
Percent Female	57.7	59.9	.1348
Percent White	64.5	68.9	.0024
Percent Black	11.4	9.4	.0313
Percent Other Race	24.9	21.7	.0062
Mean (SD) Number of Chronic conditions noted on record	7.8 (3.4)	7.1 (3.6)	<.0001
Insurance:			
Medicare	94.2	93.6	.0079
Medicaid	2.3	1.4	
Commercial Insurance	2.3	2.8	
Other Payers	1.2	2.2	
Dementia Type:			
Alzheimer's	71.9	76.2	.0012
Dementia	28.1	23.8	
Index Admission Principal Diagnosis:			
Urinary Tract Infection	30.9	30.4	<.0001
Pneumonia	28.0	29.3	
Sepsis	14.7	17.4	
Congestive Heart Failure	16.0	10.6	
Alzheimer's or Dementia	10.4	12.4	
Discharge Destination:			
Discharged to Home	33.1	30.9	<.0001
Discharged to Hospice	2.7	13.8	
Discharged To Nursing home	56.6	42.8	
Discharged to other settings	7.6	12.5	
Index Admission Resources:			
LOS on Index Admission	8.4 (11.2)	6.3 (6.4)	<.0001
Cost of Index Admission	\$11,396 (\$10,584)	\$8,915 (\$8,653)	<.0001

Table 3: Multivariable Logistic Regression Models Predicting Readmission at 30 Days

Variable Names	Model 1: OR All Variables Readmitted by 30 Days	Model 2: OR Only Significant Variables Retained Readmitted by 30 days	Model 2: 95% OR Confidence Interval
No Palliative Care Consult reference			
Palliative Care Consult	0.697	0.557	0.362-0.858
Patient Characteristics:			
Age in years	0.989	0.987	0.980-0.995
Male reference			
Female	0.935		
White reference			
Black	1.144		
Hispanic	1.247	1.220	1.053-1.413
Number of Chronic conditions noted on record	1.039	1.038	1.018-1.058
Insurance:			
Medicare	1.078		
Medicaid	1.346		
Commercial Insurance	1.212		
Other Payers Reference			
Index Admission Principal Diagnosis:			
Urinary Tract Infection reference			
Pneumonia	0.956		
Sepsis	0.854		
Congestive Heart Failure	1.407	1.527	1.270-1.836
Alzheimer's or Dementia	0.851		
Discharge Destination:			
Discharged to Home	1.894		
Discharged to Hospice	0.379	0.235	0.164-0.338
Discharged To Nursing home	2.292	1.392	1.225-1.583
Discharged to other settings reference			
Index Admission Resources:			
LOS on Index Admission	1.029	1.026	1.016-1.035