

Spring 2017

# A Systematic Review - The Effect of Hospice and Palliative Care

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## Recommended Citation

Brown, Justin M.; Havener, David J.; and Byrne, Jeffrey T., "A Systematic Review - The Effect of Hospice and Palliative Care" (2017). *Honors Research Projects*. 468.

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A Systematic Review: The Effect of Hospice and Palliative Care

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### **Abstract**

Many older adults nearing death experience unnecessarily invasive and costly healthcare treatments, often causing more harm than good. Hospice and palliative care interventions offer a possible solution to this problem by prioritizing high-quality and cost-effective care with a strong focus on comfort and satisfaction. The authors of this paper seek to answer the following question: Do hospice and palliative care interventions directed toward older adults at the end of life improve quality of life, cost of care, and satisfaction? This paper thoroughly reviews and critically appraises existing research related to the effect of hospice and palliative care directed toward older adults at the end of life. Twenty primary studies published between 2011 and 2016 were identified, reviewed, and critically evaluated in an effort to answer this question. The publications were diverse in objective, scope, and design, but all contributed to the conversation regarding this potential solution to substandard care for older adults at the end of life. Based on the existing evidence, the authors came to the following conclusion: hospice and palliative care interventions are associated with improved quality of life in five out of six measured areas, decreased cost of care, and high satisfaction for care recipients and providers alike. Ten recommendations for clinical practice and five recommendations for future research are discussed.

### A Systematic Review: The Effect of Hospice and Palliative Care

There were 43.1 million Americans over the age of 65 in 2012, comprising nearly 15% of the total United States population (United States Census Bureau, 2014). This number rose by 11% in the four years prior to this study alone, and it is estimated that the elderly population in the United States will nearly double by the year 2050 (United States Census Bureau, 2014; Ortman, Velkoff, & Hogan, 2014). According to the National Institute of Health (2011), the number of medical care services utilized in developed countries tends to increase as individuals age. As a result, healthcare expenditures for adults over the age of 65 are considerably higher than other age groups (National Institute of Health, 2011). Furthermore, while only 5% of beneficiaries are in the final year of their lives, this group accounts for 25% of all Medicare dollars spent (Riley & Lubitz, 2010). Medicare does not cover all medical expenses, and the cost of care can be crippling for low-income older adults and their families (Cubanski, Casillas, & Damico, 2015).

Researchers have found widespread incongruence between older adult preferences and actual interventions; while most patients value a good life over a long life, death is too often prolonged at the expense of functional ability and achievement of a good death (Heyland et al., 2015). Although older adults at the end of life acknowledge that they would like to die at home, many instead die in intensive care units (ICUs) or long-term care facilities (Lees, Maryland, West, & Germaine, 2014). Only 29% of US deaths in 2014 occurred in the home, compared to 30% in inpatient medical facilities, nearly 20% in long-term care facilities and nursing homes, and another 6% in outpatient medical facilities and emergency rooms (Centers for Disease Control and Prevention, 2015).

A potential solution to these problems is found in hospice and palliative care interventions, which focus on promoting comfort and enhancing quality of life in patients at the end of their lives. The National Hospice and Palliative Care Organization, the largest nonprofit organization representing hospice and palliative care providers in the United States, defines hospice care as “a team-oriented approach to expert medical care, pain management, and emotional and spiritual support expressly tailored to... the patient’s needs and wishes... for people facing a life-limiting illness or injury” (2016, p. 1). Hospice care is only covered under Medicare for terminally ill patients with a life expectancy less than six months, so palliative care extends the hospice care philosophy to patients who would benefit from this type of care earlier in their disease process (Centers for Medicare & Medicaid Services, 2015; National Hospice and Palliative Care Organization, 2016). Growing interest in reducing the frequency and extent of these problems has prompted research regarding quality of life, cost effectiveness, and satisfaction.

The purpose of this paper is to identify, discuss, and critically appraise the evidence about the effect of hospice and palliative care services directed toward older adults at the end of life. Recommendations for practice and future research are outlined based on the critical appraisal and synthesis of evidence. This paper answers the following Population – Intervention – Comparison – Outcome (PICO) question: Do hospice and palliative care interventions directed toward older adults at the end of life improve quality of life, cost of care, and satisfaction?

### **Methods**

This paper will focus on hospice and palliative care interventions directed toward older adults rather than terminally ill or dying populations in general. In addition, only primary sources published within the past five years are included in the review. Studies conducted in various

countries of origin are included, as both patient preferences toward the end of life and hospice and palliative care models are comparable across demographic lines. Although definitions of hospice and palliative care may vary slightly across populations, and cultural differences may exist, it was expected that a broader investigation would strengthen the paper's conclusions and demonstrate greater generalizability.

Initial studies were identified through review by the three authors – first individually, and later in collaboration. Initially, 96 journals were identified as meeting preliminary search criteria from health based research databases such as the Cumulative Index to Nursing and Allied Health Literature (CINAHL), Cochrane Library, MEDLINE, PubMed, and PsycINFO. Search terms included variations of the following: “hospice OR palliative care,” “quality of care OR quality of life,” “patient satisfaction OR family satisfaction,” “intensive care units,” “outcomes,” “cost,” and “older adults OR elderly.” The results were categorized and reviewed by the authors. Twenty journal articles were ultimately selected. Inclusion criteria for the final 20 studies used in this paper were as follows: focus on the older adult population, discussion of the effect of hospice and palliative care, publication within five years of January 2016 (the beginning of the authors' research project), and identification as a primary research article. As much as possible, irrelevant studies or those with indications of bias were excluded from the systematic review.

### **Findings**

Twenty primary sources are included in this review. Twelve sources utilized a retrospective analytic design, primarily analyzing information originating from existing patient data (Albanese, Radwany, Mason, Gaymali, & Dieter, 2013; Araw et al., 2015; Chan & Epstein, 2012; Chen et al., 2015; Enguidanos, Vesper, & Lorenz, 2012; Horton et al., 2016; Hwang et al., 2013; Moorhouse & Mallerie, 2012; Pereira et al., 2015; Reyes-Ortiz, Williams, & Westphal,

2015; Starks, Wang, Farber, Owens, & Curtis, 2013; Wu, Newman, Lasher, & Brody, 2013).

Two sources utilized a prospective analytic design, exclusively exploring patient data from medical records and databases (Morandi et al., 2013; Orsini et al., 2015). Four sources utilized a prospective analytic and descriptive design, analyzing data from both medical charts and patient or family surveys (Armstrong, Jenigiri, Hutson, Wachs, & Lambe, 2012; Heyland et al., 2015; Laguna, Goldstein, Allen, Braun, & Enguidanos, 2012; Stabenau et al., 2015). The final two sources were exclusively descriptive in design, only analyzing data from patient and family survey responses (Black et al., 2011; Parker, Remington, Nannini, & Cifuentes, 2013).

Two studies explored national health data (Hwang et al., 2013; Horton et al., 2016), five studies analyzed data from multiple locations (Black et al., 2011; Heyland et al., 2015; Moorhouse & Mallerie, 2012; Stabenau et al., 2015; Starks et al., 2013), and the remaining 13 studies focused on data from a single location (Albanese et al., 2013; Araw et al., 2015; Armstrong et al., 2012; Chan & Epstein, 2012; Chen et al., 2015; Enguidanos et al., 2012; Laguna et al., 2012; Morandi et al., 2013; Orsini et al., 2015; Parker et al., 2013; Pereira et al., 2015; Reyes-Ortiz et al., 2015; Wu et al., 2013). Demographically, the majority of the studies were American (Albanese et al., 2013; Araw et al., 2015; Armstrong et al., 2012; Black et al., 2011; Chen et al., 2015; Enguidanos et al., 2012; Horton et al., 2016; Laguna et al., 2012; Morandi et al., 2013; Orsini et al., 2015; Pereira et al., 2015; Reyes-Ortiz et al., 2015; Stabenau et al., 2015; Starks et al., 2013; Wu et al., 2013), but one was from Taiwan (Hwang et al., 2013), two were from Canada (Heyland et al., 2015; Moorhouse & Mallerie, 2012), and one was completed in China (Chan & Epstein, 2012).

The objectives of the studies varied significantly, and various outcomes were reported as a result. Only five studies directly compared hospice and palliative care with traditional medical

care (Albanese et al., 2013; Enguidanos et al., 2012; Hwang et al., 2013; Horton et al., 2016; Hwang et al., 2013), and one of these (Albanese et al., 2013) also compared patient data before and after hospice and palliative care interventions. Four studies only compared patient data before and after hospice and palliative care interventions (Araw et al., 2015; Armstrong et al., 2012; Black et al., 2011; Laguna et al., 2012). Five studies compared the timing of hospice and palliative care interventions (Chan & Epstein, 2012; Pereira et al., 2015; Reyes-Ortiz et al., 2015; Stabenau et al., 2015; Wu et al., 2013). Three studies analyzed outcomes for patients receiving hospice and palliative care interventions (Chen et al., 2015; Moorhouse & Mallerie, 2012; Parker et al., 2013), and three others analyzed outcomes for patients receiving traditional care without hospice and palliative care interventions (Heyland et al., 2015; Morandi et al., 2013; Orsini et al., 2015). All outcomes mentioned in this paper fit into the categories of quality of life, cost of care, and satisfaction.

### **Validity and Reliability**

Due to each study's distinct objective, scope, and design, a comprehensive body of evidence was developed based on the most recent research related to the effect of hospice and palliative care interventions directed toward older adults at the end of life. The 20 studies were critically appraised based on the reliability of instruments and statistical analysis software, subjective assessment of the designs' face validity, and acknowledgement of limitations.

**Retrospective designs.** Patient data was exclusively collected from review of existing medical records. As a result, many of the studies did not require the use of previously validated assessment instruments. Propensity-scoring methods were utilized to match patients under investigation with a control group. T-tests and chi-square tests were common methods of statistical analysis, although McNemar's test, conditional logic regression analysis, and the

Mann-Whitney U-test were also utilized by some researchers. One group of researchers created their own tool, which they claimed to display face validity. Sample sizes ranged from 1,815 patients matched with 1,790 control patients (Starks et al., 2013) to 54 patients matched with 108 control patients (Chen et al., 2015).

**Prospective designs.** Multiple previously validated assessment tools were utilized in the studies with prospective designs. A panel of healthcare professionals categorized potentially inappropriate medications (PIMs) and actually inappropriate medications in the study by Morandi et al., demonstrating face validity (2013). Orsini et al. (2015) utilized a previously validated tool in addition to patient information from existing medical record. Conclusions may have been less reliable, sample sizes were much smaller than those with a retrospective design: 120 patients (Morandi et al., 2013) and 70 patients (Orsini et al., 2015).

**Prospective and descriptive designs.** All of the studies with both prospective and descriptive designs discussed the validity of their tools. Each had been previously validated except for some in the study by Armstrong et al. (2012), which the researchers determined demonstrated face validity. Laguna et al. (2012) and Stabenau et al. (2015) did not utilize any assessment tools, as their data was exclusively collected from existing medical records. The reliability of the findings varies significantly due to a wide range of sample sizes, from 25 patients in the study by Armstrong et al. (2012) to 1,671 patients in the study by Heyland et al. (2015).

**Descriptive designs.** Black et al. (2011) utilized previously validated assessment tools, but these were slightly adjusted to adapt to the study. Statistical analysis was completed with standard descriptive statistics including t-tests. Similarly, Parker et al. (2013) utilized a combination of validated and modified versions of validated tools. The chart-auditing tool in this

study had not been previously validated, but the researchers claimed that it demonstrated face validity (Parker et al., 2013). Sample sizes were small in this category as well, with 94 participants in the study by Black et al. (2011) and 210 participants in the study by Parker et al. (2013).

### **Limitations Across Studies**

Lack of randomization is the primary limitation of research related to the effect of hospice and palliative care interventions. In fact, this limitation was present in all 20 of the studies in this systematic review. Given the expected improvement in quality of life measurements associated with hospice and palliative care, it would be unethical to provide these services to some patients while randomly excluding others. The design of a few of these studies minimized this limitation by including data from the electronic medical record of every patient meeting inclusion criteria. In these situations, random sampling was not necessary, as data for the entire population receiving care from a specific hospital system could be collected. Nevertheless, the inability of researchers to randomize sampling and assignment makes it impossible to make causative statements about the effect of hospice and palliative care on patient outcomes.

Problems related to the studies' samples also existed. Convenience sampling and lack of resources for data collection resulted in small sample sizes for many studies (Araw et al., 2015; Armstrong et al., 2012; Laguna et al., 2012; Moorhouse & Mallerie, 2012; Orsini et al., 2015; Parker et al., 2013; Stabenau et al., 2015; Wu et al., 2013). The low number of participants was often related to lack of interest or lack of availability of information rather than formal power calculations. Some researchers reported low response rates or high dropout rates (Black et al., 2011), and others agreed that the sample many not have been reflective of the entire population

of interest (Araw et al., 2015; Horton et al., 2016; Orsini et al., 2015; Wu et al., 2013). A few studies had inclusion criteria somewhat different than the authors of this paper: Black et al. (2011) accepted participants ages 55 or older, and Heyland et al. (2015) accepted participants only over the age of 80. The presence of ‘younger’ older adults and restriction to only ‘older’ older adults may have further impacted results. To meet this systematic review’s requirement for twenty primary sources, the authors included a few studies that had somewhat different definitions of ‘older adults’ than the traditional definition of 65 years and older originally intended for this review.

A few factors related to the studies’ settings reduced generalizability. Specifically, thirteen studies collected data only from a single location or hospital system (Albanese et al., 2013; Araw et al., 2015; Armstrong et al., 2012; Chan & Epstein, 2012; Chen et al., 2015; Enguidanos et al., 2012; Laguna et al., 2012; Morandi et al., 2013; Orsini et al., 2015; Parker et al., 2013; Pereira et al., 2015; Reyes-Ortiz et al., 2015; Wu et al., 2013) and others lacked generalizability for other reasons. For example, the study by Black et al. (2011) focused exclusively on the home health setting, so results may not be generalizable to hospital environments or other inpatient settings. Some studies had participants that were primarily Caucasian due to the location of the data collection site (Heyland et al., 2015), and others were conducted in countries other than the United States (Chan & Epstein, 2012; Heyland et al., 2015; Hwang et al., 2013; Moorhouse & Mallerie, 2012). The authors of this systematic review chose to include studies conducted outside of the United States to create a more comprehensive body of research related to the effect of hospice and palliative care, but it must be acknowledged that cultural, political, and organizational differences may have further impacted results.

As mentioned previously, it would be unethical to randomly require some older adults at the end of life to refuse hospice and palliative care interventions. Thus, all 20 studies lacked a randomly assigned control group. Several included studies had no control group at all, as their objectives were not necessarily to compare hospice and palliative care with traditional medical care, but rather to describe them individually (Chen et al., 2015; Heyland et al., 2015; Moorhouse & Mallerie, 2012; Morandi et al., 2013; Orsini et al., 2015; Parker et al., 2013). Other studies compared the timing of hospice and palliative care interventions but did not compare patients receiving these interventions with those who received standard medical care (Chan & Epstein, 2012; Pereira et al., 2015; Reyes-Ortiz et al., 2015; Stabenua et al., 2015; Wu et al., 2013). Patients served as their own control group in four studies, as outcomes were considered both pre-intervention and post-intervention (Araw et al., 2015; Armstrong et al., 2012; Black et al., 2011; Laguna et al., 2012). Finally, among those studies with propensity-matched control groups, researchers agreed that even these patients may not have accurately represented a true sample of patients lacking hospice and palliative care interventions (Albanese et al., 2013).

Various other factors may have skewed results of the studies in this systematic review. First, many studies had a retrospective design or utilized data that was collected for the purpose of other studies; that is, some data was not collected specifically for the studies included this review (Albanese et al., 2013; Araw et al., 2015; Chen et al., 2015; Chan & Epstein, 2012; Enguidanos et al., 2012; Horton et al., 2016; Hwang et al., 2013; Moorhouse & Mallerie, 2012; Pereira et al., 2015; Reyes-Ortiz et al., 2015; Starks et al., 2013; Wu et al., 2013). Second, providers of diverse educational backgrounds and specialties may have varying attitudes toward palliative care interventions, impacting their commitment to referrals and research regarding

existing programs (Armstrong et al., 2012; Orsini et al., 2015). Third, some studies had arbitrary definitions of terms such as “prolonged dying” or theoretical definitions that were oversimplified, such as “good death” (Chan & Epstein, 2012; Heyland et al., 2015). Finally, it is possible that some palliative care interventions may have occurred prior to the study period or outside the context of the measured interventions (Chen et al., 2015; Enguidanos et al., 2012; Orsini et al., 2015; Stabenau et al., 2015).

## **Discussion**

### **Quality of Life**

The inclusion of quality of life among this study’s variables allowed for a diverse range of related outcomes. The term itself is multifaceted, so the authors identified six measurable components based on current research related to the effect of hospice and palliative care. These include length of stay (LOS), hospital admission and readmission, pain and symptom management, advanced care planning, invasive procedures and inappropriate medications, and death. Eighteen studies are reviewed below that address at least one of these outcomes.

**Length of stay.** Six studies outlined in this paper provide information on this first quality of life measurement. Wu et al. (2013) and Pereira et al. (2015) both reported that earlier palliative care consultation was associated with statistically significant reduction in emergency department and ICU LOS. The post-admission group in the study by Wu et al. (2013) had a large sample size of 1,385 participants, but the pre-admission group in this study and both groups of the Pereira et al. (2015) study had small sample sizes, limiting generalizability of results. Anecdotally long median hospital LOS was reported in the study by Heyland et al. (2015), but the absence of hospice and palliative care interventions was only presumed; some level of palliative care interventions may have existed.

On the other hand, Albanese et al. (2013) reported no significant difference in LOS between acute palliative care unit (APCU) patients and control patients. Despite this study's larger sample size and use of propensity matched patients, there was some question as to whether the control group appropriately estimated the outcomes of patients transferred to a place other than the APCU. The presence of hospice and palliative care programs has little effect on hospitals' mean ICU LOS, according to Horton et al. (2016), but this may underscore the importance of hospice and palliative care utilization rather than mere program existence.

Perhaps the most valid study of the effect of hospice and palliative care interventions on LOS was by Reyes-Ortiz et al. (2015). This study was distinct in that it investigated days from consult to discharge (DCDAYS), likely a more accurate outcome measure than LOS alone, as palliative care consultation has no effect on LOS until the intervention has taken place.

Supported by the largest sample size of studies discussing this quality of life metric, it was found that early palliative care consultation was associated with both lower LOS and lower DCDAYS (Reyes-Ortiz et al., 2015).

**Hospital admission and readmission.** Nine studies outlined in this paper provide information on the effect of hospice and palliative care interventions on hospital admission and readmission. Chen et al. (2015) reported that usual care patients were three times as likely to be admitted to the hospital during a six-month period when compared to patients enrolled in Palliative Care Homebound Program. In a study with a larger sample size, palliative care utilization was found to be associated with lower 30-day readmission rates than palliative care consultation alone (Enguidanos et al., 2012). Despite the report by Chen et al. (2015) that enrollees in the palliative care program had no effect on the frequency of emergency room visits,

the conclusion that hospital admission and readmission were lower among palliative care recipients was consistent between both studies.

**Pain and symptom management.** Seven studies outlined in this paper provide information on the effect of hospice and palliative care interventions on pain and symptom management. Pereira et al. (2015) reported that patients with a palliative care consultation saw an increase in opioid administration and an overall increase in spending on drugs for symptom management. Hwang et al. (2013) and Araw et al. (2015) also concluded that patients receiving palliative care received more analgesics and drugs for symptom management while simultaneously experiencing a decrease in disease management drugs like antibiotics and cardiac medications. The studies by Araw et al. (2015) and Pereira et al. (2015) both contained relatively small sample sizes of 60 and 90 patients, respectively, but the study by Hwang et al. (2013) had 729 patients enrolled. All three of these studies drew the same conclusion, so it can be concluded that patients on palliative care typically receive more medication to alleviate pain and non-pain symptoms.

Regarding the actual impact of hospice and palliative care on actual pain and symptom management, Chan and Epstein (2012) reported that greater length of palliative care interventions were associated with lack of pain and anxiety in the final assessment before death. Many patients receiving palliative care interventions, however, still showed signs of pain or anxiety in the final assessment before death (Chan & Epstein, 2012). The sample size of this study was among the largest in the studies addressing this quality of life metric, and its national scope further supports the strength of the conclusion.

In contrast, Black et al. (2011) reported that decrease in pain among patients receiving home hospice services was so small on a numerical scale that it was clinically insignificant. In

addition, home hospice was associated with no significant reduction in non-pain symptoms such as tiredness, nausea, and depression (Black et al., 2011). This study had low participation and an extremely high dropout rate, which combined with the researchers' uncertainty regarding the effect of caregiver proxy pain reporting. As a result, its conclusions were fairly unsupported and failed to contribute to the body of research regarding the effect of hospice and palliative care on quality of life.

A study by Parker et al. (2013) further challenged the positive impact of hospice and palliative care on quality of life, as they reported no significant improvement in pain control following consultation. This may be explained, however, by the reality that nearly a third of participants failed to follow pain management recommendations from the healthcare team. Laguna et al. (2012) found that pain was reduced two hours and 24 hours following palliative care consultation, and at discharge. The researchers explained an increase in pain following discharge by acknowledging that many of the patients in the study were discharged to home without hospice and palliative care services (Laguna et al., 2012). Evidently, palliative care utilization rather than only consultation is necessary to improve patient pain.

**Advanced care planning.** Four studies outlined in this paper provide information on the effect of hospice and palliative care interventions on advanced care planning. Only one study in this systematic review compared advanced care planning among patients receiving palliative care with those receiving traditional care, while the other three represented only patients receiving palliative care interventions. Nevertheless, the conclusions were consistent between all four studies. Chen et al. (2015) showed 100% of palliative care recipients had documented conversations with healthcare providers about goals of care, compared with only 41% among control patients. Furthermore, palliative care interventions were also associated with higher

percentage of advanced care documentation on file (Chen et al., 2015). Many patients in two different palliative care programs were successful in making decisions about future treatment preferences and had documented conversations with healthcare providers about transitions in care (Moorhouse & Mallerie, 2012; Parker et al., 2013). Araw et al. (2015) furthered these conclusions by reporting the success of palliative care consultation in encouraging over one third of dementia patients to sign DNR orders.

**Invasive procedures and inappropriate interventions.** Seven studies outlined in this paper provide information on the effect of hospice and palliative care on invasive procedures and inappropriate interventions. In a study of older adults receiving traditional medical care, over one third of PIMs prescribed were classified as AIMs, which demonstrated inattentiveness to patient frailty and likelihood that medication risks would outweigh the benefits (Morandi et al., 2013). Heyland et al. (2015) also found most traditional care recipients were prescribed treatment-related medications. Pereira et al. (2015) supported the prediction that hospice and palliative care interventions may reduce the number of prescribed AIMs, reporting an association between earlier palliative care consultation and decreased cost of drugs directed at treatment. In contrast, Araw et al. (2015) found no significant difference in average cost (and presumably, prescription) of specific treatment-related medications. Both of the latter two studies had small sample sizes related to resource availability rather than formal power calculations, so the data lacked generalizability. Thus, there is not enough information to conclude that hospice and palliative care interventions have any effect on the prescription of AIMs.

Research related to the positive impact of hospice and palliative care on the frequency of invasive procedures is more promising. The study by Orsini et al. (2015) represents the outcomes of ICU patients in the absence of hospice and palliative care interventions, where two thirds of

participants underwent invasive procedures such as triple-lumen and arterial catheter insertions. A Taiwanese study on a national scale found hospice patients were significantly less likely to experience a long list of aggressive and invasive procedures (Hwang et al., 2013). This conclusion is especially noteworthy due to the acute care preferences typically demonstrated among patients in families of Asian descent (Hwang et al., 2013).

Moorhouse & Mallerie (2012) supported these findings, reporting that patients chose to decline 83.1% of previously scheduled invasive procedures and treatments following completion of the Palliative and Therapeutic Harmonization program in Canada. Moorhouse and Mallerie (2012) reported similar results in an American study with a smaller sample size of only 150 patients, where most participants declined previously scheduled invasive procedures following palliative care consultation. Despite the lack of control group in the study by Moorhouse and Mallerie (2012), this study supports the findings of the national study by Hwang et al. (2013).

In contrast, hospice and palliative care interventions were found to have no effect on ventilator days following palliative care consultation in the study by Pereira et al. (2015). The small sample size and single-center nature of this study reduces the validity of this conclusion compared to other data that reports hospice enrollment was associated with lower rates of endotracheal intubation in the first place (Hwang et al. 2013).

**Death.** Six studies outlined in this paper provide information on this final quality of life measurement. Reyes-Ortiz et al. (2015) found that early palliative care was associated with fewer hospital deaths and higher hospice deaths when compared to late palliative care. Similarly, Stabenau et al. (2015) studied the effect of the timing of hospice admission and found that earlier admission was associated with longer survival. Although these studies did not directly compare the outcomes of palliative care with traditional care, their conclusions can be reasonably

extended to estimate that patients receiving palliative and hospice interventions in general may have fewer hospital deaths and more days at the end of life than those who do not utilize palliative care services at all. This idea is intuitive: if more days of palliative care services are preferred to fewer days of palliative care services, then it is possible that any number of days of palliative care services may be preferred to no days of palliative care services. Heyland et al. (2015) and Orsini et al. (2015) contributed somewhat to this conversation by reporting prolonged time to death and existence of ICU deaths among presumed recipients of traditional care, respectively. As mentioned, however, the strength of these conclusions in regards to the positive impact of palliative care over traditional care is low due to lack of control group and the mere presumption of the absence of palliative care services. Moorhouse & Mallerie (2012) also lacked a control group, but the reported success of some patients in electing to receive end of life care at home supports the overall conclusion that palliative care services may lead to improved quality of death.

The only study that challenged this conclusion was the national review of 295 hospitals with palliative care services and 679 hospitals without palliative care services by Horton et al. (2016). The researchers reported no significant difference in hospice enrollment before death when comparing hospitals with and without palliative services (Horton et al., 2016). Despite the broad scope of this national study, some of the participating hospitals' palliative programs were very small and may have made the effect of all palliative hospitals appear lower than it actually was. Evidently, the mere existence of palliative programs may not be enough to improve patient outcomes. The importance of palliative program utilization is underscored by this study and supports the studies' conclusion that palliative care services may improve patient quality of death in older adults at the end of life.

**Summary.** Due to the extensive nature of this section, a summary is necessary to ensure that the most reliable and accepted data guides the conclusions addressed in the final section of this systematic review. All six quality of life metrics – length of stay, hospital admission and readmission, pain and symptom management, advanced care planning, invasive procedures and inappropriate interventions, and death – are revisited below.

Early hospice and palliative care consultation is associated with reduction in emergency department LOS, ICU LOS, and DCDAYS when compared to late hospice and palliative care consultation. Admission to APCUs is not associated with decreased LOS, however, and the mere existence of hospice and palliative care programs has little effect on hospitals' mean ICU LOS. Palliative care program utilization is associated with decreased hospital admission and lower 30-day readmission, but not with decreased emergency room visits. Palliative care consultation is associated with increases in medications for pain and symptom management and decreases in medications for disease treatment. The actual impact of hospice and palliative care interventions on pain and symptom management, however, is still undetermined. Hospice and palliative care interventions are associated with improved advanced care planning and initiation of DNR orders. Hospice and palliative care are not associated with the prescription of AIMS but are significantly associated with reduced aggressive and invasive medical procedures. Finally, early palliative care consultation is associated with fewer hospital deaths and more home deaths when compared to late palliative care consultation.

### **Cost of Care**

The results related to the effect of hospice and palliative care interventions on cost of care were more consistent across studies than in the quality of life categories. Araw et al. (2015) and Pereira et al. (2015) studied 60 and 90 patients (respectively) in urban hospitals, and both

reported that medication costs were significantly reduced following palliative care interventions. Armstrong (2012) studied 25 patients in a rural hospital and reported reduced laboratory and imaging costs but no significant difference in pharmacy costs following palliative care interventions. Despite the small sample sizes and nonrandomized approach with no control group, the results of these three studies were consistent in their conclusion that palliative care interventions are associated with reduced cost. Albanese et al. (2013) furthered this conclusion and estimated a hospital's total cost avoidance in one year as the result of patient transfer to an APCU was nearly \$850,000. The only difference between the researchers' conclusions was that Albanese et al. (2013) found that the reduction in daily hospital costs following transfer was only significant among patients transferred from the ICU. In contrast, Orsini et al. (2015) described the high cost of older adults in the ICU, but the lack of control group and the mere presumption that palliative care interventions were absent reduced the strength of any conclusions about the effect of palliative care.

The final two studies provide the strongest evidence that palliative care interventions reduce cost. Hwang et al. (2013) found that cost was nearly three times lower among hospice patients when compared to propensity matched nonhospice patients. Specifically, expenses were lower in the hospice group in every assessed cost category (Hwang et al., 2013). The only limitations of this study were lack of descriptive data, lack of control of factors such as socioeconomic status and patient preferences, and the lack of generalizability to the United States due to the research occurring in Taiwan. That said, an American study with an even larger sample size found palliative care interventions were associated with lower daily costs for the first 30 days in the hospital (Starks et al., 2013). There was no significant difference in cost between the palliative care and propensity matched traditional care groups, however, after 30 days in the

hospital. The researchers predicted that this was the case because older adult patients in the hospital over a month likely preferred more aggressive treatments than others in the palliative care group (Starks et al., 2013). These two studies in addition to the five that were previously mentioned support the conclusion that palliative care interventions reduce healthcare costs on both individual and hospital levels.

### **Satisfaction**

Despite only a few studies published in five years from the beginning of the authors' literature review period, data regarding the effect of hospice and palliative care interventions on satisfaction are especially convincing. Parker et al. (2013) reported patient and family satisfaction results averaged 4 (very satisfied) in every category assessed, while Armstrong et al. (2012) added to this conclusion by reporting high provider satisfaction among physicians working with hospice and palliative services. The only negative report of patients' experience with palliative care interventions was in a study by Moorhouse & Mallerie (2012), where 63% of patients agreed that resulting conversations were upsetting or emotionally charged. Nevertheless, all 50 patients in the study agreed that the transparent conversations about end of life preferences were worthwhile and helpful in care planning (Moorhouse & Mallerie, 2012). All three of these studies had small sample sizes and no control group, but the consistency of the results between the three diverse healthcare environments studied strengthens of the conclusion: patients receiving hospice and palliative care interventions report high levels of satisfaction, and this satisfaction may extend to the provider as well.

### **Conclusion**

At the beginning of this systematic review, the problem was introduced that older adults in the United States experience aggressive, unnecessary, or otherwise inadequate medical care

toward the end of life. The study design was outlined, and inclusion criteria for the final 20 primary sources were identified. Each of the studies was critically evaluated in regards to validity, reliability, and limitations. Finally, the current state of science was synthesized by summarizing research in terms of the statistical significance of each study's results. This final section of the paper is devoted to recommendations for clinical practice and future research.

### **Future Directions**

After reviewing the discussion sections of this systematic review's twenty studies and considering the body of research about the topic of hospice and palliative care, the authors have identified ten recommendations for clinical practice:

- *Promote early palliative care consultation.* Methods to accomplish this include increasing palliative care presence in the emergency department, referring to palliative care consultation earlier in patients' disease processes, and initiating end-of-life conversations with younger patients in the case that circumstances lead to rapid progression of disease.
- *Promote identification of patients that may benefit from palliative care consultation.* Methods to accomplish this include maintaining adequate nurse-to-patient ratios to allow for additional assessment of palliative care needs, developing tools to identify patients least likely to benefit from ICU interventions, and screening for palliative care needs as part of the admission process.
- *Improve strategies for educating patients and families about hospice and palliative care interventions.* Methods to accomplish this include contextualizing the risks and benefits of proposed treatments in terms of frailty, initiating efforts to educate patients and

families about poor prognoses related to progressive disease or disability, and encouraging compliance with pain relief recommendations through proactive education.

- *Improve access to palliative care interventions.* Methods to accomplish this include improving penetration of hospice and palliative care services in underserved populations, referring to other hospital systems where these services exist, and improving the availability of palliative care programs regardless of prognosis and treatment decisions.
- *Improve quality of palliative care interventions.* Methods for accomplishing this include improving palliative care for patients with higher risk of unnecessarily invasive and aggressive procedures, developing evidence-based guidelines for palliative care promotion in specific disease processes, and promoting palliative care consultation and hospice enrollment in non-cancer patients experiencing unofficial diagnoses such as frailty.
- *Promote effective screening and assessment of patient preferences.* Methods to accomplish this include reassessing patient preferences and goals of care as health conditions and prognoses change, introducing campaigns that seek to encourage healthcare providers to ask at-risk patients about their end of life preferences, and creating routine screening guidelines related to appropriateness of palliative care consultation.
- *Improve documentation and communication regarding patient preferences.* Methods to accomplish this include encouraging clear and specific documentation regarding patient preferences and advanced directives, ensuring that advanced directives are considered when providing care to older adult patients, and promoting improved communication among healthcare providers regarding patient preferences.

- *Promote regular evaluation of appropriateness of interventions.* Methods to accomplish this include evaluating the appropriateness of medications prior to transfer out of the ICU, utilizing multidisciplinary teams to determine the appropriateness of medication prescriptions prior to discharge, and creating electronic medical record software that automatically notifies clinicians of PIM prescription in care settings with lower availability of resources.
- *Promote provider utilization of hospice and palliative care methodologies.* Methods to accomplish this include training providers of all disciplines and education levels in palliative care principles, developing training programs to improve provider understanding of how to incorporate palliative knowledge and skills into routine care, and creating incentives for palliative care certification and training.
- *Promote hospice and palliative care utilization following discharge and transitions in care.* Methods to accomplish this include improving access to palliative care programs at home and in other outpatient care facilities, prioritizing follow-up with patients after palliative care consultation in the case that diseases progress or complications increase, and ensuring that analgesic administration remains consistent and ‘around the clock’ as necessary during transitions in care.

### **Recommendations for Future Research**

After reviewing the conclusions of this systematic review’s 20 studies and considering the body of research about the topic of hospice and palliative care, the authors have identified five recommendations for areas of future research:

- *Research investigating the characteristics of patients who would most benefit from hospice and palliative care.* This area of research relates to the authors’ second

recommendation for clinical practice, which was to promote identification of patients that may benefit from palliative care consultation. The method utilized by Morandi et al. (2013) reported that discharge to places other than home as well as discharge post surgery were associated with the administration of PIMs, but none of the factors measured predicted prescription of AIMs. To reduce the prescription of AIMs and the initiation of other unnecessarily harmful methods of treatment, further research is needed to determine risk factors for these adverse outcomes.

- *Research investigating the effect of hospice and palliative care in diverse settings.* Due to low participation, the scope of single-center studies, variance between health systems of different countries, and samples that didn't accurately represent the population of interest, lack of generalizability was prevalent across the studies. Research regarding the effect of hospice and palliative care should be conducted in various settings – small and large, urban and rural, single-center and multi-center, inpatient and outpatient, American and foreign, nursing homes and home health. Studies with a national focus often lacked conclusions about the effects of hospice and palliative care on individuals, and studies with an individual focus often lacked conclusions about the effects of hospice and palliative care on the community level. Many studies in this review predicted a shift from hospital-based to home-based care. Can home-based palliative care services reduce hospital admission and readmission? Is home-based palliative care as effective as inpatient palliative care services? What might be the financial ramifications of this shift in care? Answers to these questions can be explored through research in this area.
- *Research investigating the most effective methods to evaluate hospice and palliative care interventions.* The development of effective hospice and palliative care evaluation tools is

a prerequisite to improving end-of-life care for older adults. Several tools are currently used to assess the impact of these interventions on patient outcomes and cost, but some methods are more reliable than others. For example, Reyes-Ortiz et al. (2015) measured DCDAYS rather than solely total LOS, as palliative care consultation could have no effect on LOS until initiated. In addition, given the report by Black et al. (2011) that patients often experience an increase in pain following discharge, tools focused on assessing pain or patient compliance post-discharge may be helpful. Other innovative methods of variable measurement and outcome evaluation are necessary in hospice and palliative care research.

- *Research investigating the effectiveness of different types of hospice and palliative care interventions.* This would allow clinicians to incorporate the current state of science into quality improvement projects directed at improving patient outcomes. As described previously, randomized control trials assigning some patients to hospice and palliative care while simultaneously assigning others to traditional medical care would be unethical. No ethical issues would exist, however, in assigning patients to different hospice and palliative care programs to determine the most effective interventions. Horton et al. (2016) estimated that there are not enough palliative care specialists to care for all the patients with palliative care needs, so comparison of various palliative care interventions occurring outside the context of direct patient contact may be indicated.
- *Research investigating methods to improve hospice and palliative care interventions.* This is ultimately the purpose of all research related to hospice and palliative care directed toward older adults at the end of life. Improving interventions would presumably lead to an improvement in patient outcomes in each of the categories discussed in this

paper – quality of life, cost of care, and satisfaction. Examples of this type of research include: utilizing evidence-based practice to determine the best strategy for pain and non-pain symptom management among hospice patients; seeking innovative methods of patient, provider, and family education related to the benefits of hospice and palliative care programs; and investigating the most effective methods of palliative care consultation in the time-sensitive and often chaotic emergency department setting. This area of research relates to at least three of the previously described recommendations for clinical practice, and this has the potential to produce the greatest change in the care of older adults at the end of life.

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## Appendix

APA formatted reference	Purpose statement. Research question.	Clinical Practice Setting, Sampling methods, Sample size.	Design. Level of Evidence.	Findings, Conclusion	Practice & Research Implications	Limitations of Findings
<p>1 Albanese, T. H., Radwany, S. M., Mason, H., Gayomali, C., &amp; Dieter, K. (2013). Assessing the financial impact of an inpatient acute palliative care unit in a tertiary care teaching hospital. <i>Journal of Palliative Medicine</i>, 16(3), 289-294. doi: 10.1089/jpm.2012.0243</p>	<p><b>Purpose Statement:</b> To estimate the cost avoidance of a single hospital's acute palliative care unit</p> <p><b>Research question:</b> How does acute palliative care unit utilization affect cost avoidance?</p>	<p><b>Setting:</b> A single tertiary care teaching hospital</p> <p><b>Sampling method:</b> All patients matching study criteria</p> <p><b>Sample size:</b> 209</p>	<p><b>Design:</b> Retrospective</p> <p><b>Level of Evidence:</b> Level 4</p>	<p><b>Findings:</b> Increased length of time from admission to palliative care consultation was associated with increased mean daily hospital cost among patients transferred from medical units. Mean cost reduction among patients transferred from medical units was \$213 per day, and among patients transferred from the intensive care unit, the mean cost reduction was \$1034 per day. Total cost avoidance during the study period was \$282,852; the estimated cost avoidance in a single year was \$848,556. There was no significant difference in length of stay between acute palliative care unit patients and control patients. There was significantly lower costs among patients transferred from intensive care units when compared with the intensive care unit control group, but there was no significant difference in direct costs between patients transferred from medical units and the respective control group</p> <p><b>Conclusion:</b> Even when conservative pre-acute palliative care unit measures are used (limiting initial costs to the two days before transfer), there is significant cost avoidance for the hospital when patients are</p>	<p><b>Recommendations:</b> Improve timely identification of patients that would desire and benefit from palliative care interventions.</p> <p>Maintain adequate nurse-to-patient ratio to allow for additional assessment of palliative care needs.</p> <p>Increase palliative care presence in emergency department.</p> <p>Continue research related to impact of different types of hospice and palliative care interventions.</p>	<p><b>Limitations:</b> The APCU in this study is a part of a developing hospital system, so the resources needed to collect data were limited in some areas. Thus, only the researchers collected data over only a four-month period, allowing for seasonal trend bias. The researchers acknowledged that pre-APCU costs may be deceptively elevated, as decreased cost in the transfer to APCUs may reflect differing goals of care more than actual operating costs. This is considered a limitation of the original study, but for the purposes of this paper, it underscores the positive financial impact of promoting palliative care over curative care. On the other hand, length of pre-APCU palliative care consultation was associated with increased daily APCU costs, but this was unable to be explained by the researchers. Estimates of cost avoidance were merely theoretical, as there was uncertainty surrounding what type of unit patients would have been transferred to in the absence of the APCU. Furthermore, the researchers acknowledged that there was some question as to whether the control group was appropriate for the study, despite matching to patients with similar demographic and clinical factors. Finally, additional revenue resulting from patient transitions to hospice payment sources were not considered in calculation of total cost avoidance.</p>

				transferred into acute palliative care units.			
2	<p>Araw, M., Kozikowski, A., Sison, C., Mir, T., Saad, M., Corrado, L., . . . Wolf-Klein, G. (2015). Does a palliative care consult decrease the cost of caring for hospitalized patients with dementia? <i>Palliative and Supportive Care, 13</i>, 1535-1549. doi:10.1017/S1478951513000795</p>	<p><b>Purpose Statement:</b> To compare pharmacy cost before and after a palliative care consultation</p> <p><b>Research question:</b> What is the effect of a palliative care consultation on pharmacy cost</p>	<p><b>Setting:</b> A single large tertiary care hospital</p> <p><b>Sampling method:</b> All patients matching study criteria</p> <p><b>Sample size:</b> 60</p>	<p><b>Design:</b> Retrospective</p> <p><b>Level of Evidence:</b> Level 4</p>	<p><b>Findings:</b> Thirty-eight percent of participants signed do-not-resuscitate orders following palliative care consultation. There was a statistically significant decrease in median medication cost from \$27.60 per day pre-consultation to \$18.05 per day post-consultation. The decrease in average cost of antibiotics and cardiac medications was insignificant, but there was a significant increase in the cost of analgesic drugs, antipsychotics, and antiemetics following palliative care consultation. In regards to use of these medications, the only statistically significant change post-consultation was an increase in analgesic administration.</p> <p><b>Conclusion:</b> Palliative care consultation is associated with decreased medication cost and simultaneous increased use of pain medications among patients with Alzheimer's Disease and end-stage dementia.</p>	<p><b>Recommendations:</b> Continue to improve quality of and access to palliative care consultation and interventions, as this results in simultaneous cost reduction and improved patient outcomes.</p> <p>Improve palliative care for patients with Alzheimer's disease, as this population is more likely to experience unnecessarily invasive and aggressive procedures than patients with other terminal diagnoses like cancer.</p> <p>Promote home hospice utilization, as this further reduces costs related to decreased readmission rates.</p> <p>Larger, multi-center studies should be completed</p>	<p><b>Limitations:</b> The sample size for this study was determined based on chart and resource availability rather than formal power calculations, so it was not large enough to be reliably generalized to other populations or other areas. In addition, the researchers acknowledged that studies utilizing a retrospective chart-review methodology do not allow for establishing cause-and-effect relationships. Finally, the study had a disproportionate number (72.9%) of participating females.</p>
3	<p>Armstrong, B., Jenigiri, B., Hutson, S. P., Wachs, P. M., &amp; Lambe, C. E. (2012). The impact of a palliative care program in a rural Appalachian community hospital: A quality improvement process. <i>American Journal of Hospice and Palliative Care</i>,</p>	<p><b>Purpose Statement:</b> To measure the impact of palliative care consultation on symptom management;</p>	<p><b>Setting:</b> A rural community hospital in southeastern Kentucky</p> <p><b>Sampling</b></p>	<p><b>Design:</b> Preintervention-postintervention study</p> <p><b>Level of Evidence:</b> Level 4</p>	<p><b>Findings:</b> Palliative care interventions resulted in improved pain, nausea, anxiety, and dyspnea but resulted in no statistical improvement in quality of life score. Patient and family satisfaction and provider</p>	<p><b>Recommendations:</b> Research should be completed to determine the "best" tool to evaluate the effect of palliative care.</p> <p>Other rural hospitals</p>	<p><b>Limitations:</b> This was a preintervention-postintervention study, so patients served as their own control group. Convenience sampling was used, and the data consisted only of patients that elected to participate in the study. Sixty-eight patients were referred to palliative care consultation services during the study period,</p>

<p>30(4), 380-387. doi:10.1177/1049909112458720</p>	<p>quality of life, patient, family, and provider satisfaction; and cost</p> <p><b>Research question:</b> What is the effect of palliative care consultation on symptom management; quality of life, patient, family, and provider satisfaction; and cost?</p>	<p><b>method:</b> All patients matching study criteria</p> <p><b>Sample size:</b> 25</p>		<p>satisfaction surveys had very positive results, but there is no preintervention-postintervention data on this. Pre-intervention costs were found to be significantly higher than post intervention costs - reduction of \$233 per day per patient in direct costs and a reduction of \$94 per day per patient in indirect costs. Laboratory costs and imaging costs also decreased following palliative care consultation, but there was no significant difference in preintervention-postintervention pharmacy costs</p> <p><b>Conclusion:</b> Palliative care consultation may lead to improved symptoms management, patient and family satisfaction, provider satisfaction</p>	<p>should also investigate the possible impact of palliative care services and consider implementing them.</p>	<p>but only twenty-five met the screening criteria and agreed to participate. A small sample size of nonrandomized participants may have introduced bias into the study, and the results from this small hospital in a rural area may not be generalizable to other settings. In addition, the researchers acknowledged their concern that due to the limited staffing and resources at this hospital, not all members of the healthcare team were fully committed to the study and may have implemented the previously existing palliative care model for the sake of convenience. Finally, some patients may have ignored the palliative care recommendations given to them, thus skewing the post-intervention data further.</p>
<p>4 Black, B., Herr, K., Fine, P., Sanders, S., Tang, X., Bergen-Jackson, K., . . . Forcucci, C. (2011). The relationships among pain, nonpain symptoms, and quality of life measures in older adults with cancer receiving hospice care. <i>Pain Medicine, 12</i>, 880-889. doi:10.1017/S14789515300103X</p>	<p><b>Purpose Statement:</b> To summarize data collected about pain, non-pain symptoms, and other aspects of quality of life during hospice care</p> <p><b>Research question:</b> What do hospice patients experience in regards to pain, non-pain symptoms, and other aspects of quality of life?</p>	<p><b>Setting:</b> Fourteen home hospice centers in the Midwest</p> <p><b>Sampling method:</b> Convenience</p> <p><b>Sample size:</b> 94</p>	<p><b>Design:</b> Descriptive</p> <p><b>Level of Evidence:</b> Level 5</p>	<p><b>Findings:</b> There was a statistically significant decrease in “worst pain” in the last 24 hours from a mean of 4.55 at the first interview to 3.26 at the second interview. On the other hand, the mean number of hours spent in pain in the past 24 hours had a statistically insignificant decrease between the first and second interview. There was no significant difference in non-pain symptoms such as tiredness, nausea, and depression between the first and second interviews. Patient reports of pain were associated with anxiety, decreased appetite, discomfort, poor symptom control, and decreased quality</p>	<p><b>Recommendations:</b> Providers should assess for non-pain symptoms in addition to pain, as non-pain symptoms may impact pain severity.</p> <p>Utilize evidence-based practice to determine the best strategy for pain and non-pain symptoms among hospice patients.</p>	<p><b>Limitations:</b> Criteria for acceptance into the study was that participants must be 55 years or older, which contrasts with many of this systematic reviews studies that accepted patients 65 years or older. The presence of ‘younger’ older adults among the participants may have skewed data slightly. Many patients (341) that met study criteria refused to participate, and it was possible that those who agreed to participate were more ill or closer to the end of life than the total study population. The study also had a high dropout rate, with twenty-four of the original participants failing to complete the second interview. Similarly, five of the participants who completed the first interview independently required a caregiver to complete the second interview on their behalf. Caregiver reports of pain were typically higher than patient reports of pain, perhaps appropriately, as patients requiring proxy reporting were likely more</p>

				<p>of life. This is evidence that hospice care may help to reduce these non-pain symptoms, but due to statistically insignificant correlations in the caregiver report group, the overall correlation was also statistically insignificant.</p> <p><b>Conclusion:</b> Hospice care can positively impact pain severity and quality of life while reducing non-pain symptoms among patients at the end of life. The correlations between hospice care and non-pain symptoms and quality of life were relatively weak, but there was a statistically significant association between hospice care and pain relief. That said, the level of change in pain was small enough that it may not be clinically significant for the patient.</p>		<p>frail or experiencing greater impairment or worse symptoms.</p> <p>The “worst pain” at seventy-two hours and at one week after hospice admission was moderate, but patients also reported severe pain for an average of one to two hours daily. The inconsistency of these responses may be the result of older adults’ impaired memory of past events. Further, the study did not include comparisons of pain and non-pain symptoms with the types of interventions initiated, so the findings have little clinical significance. Finally, the study focused exclusively on the home setting, so results cannot be generalized to other locations such as inpatient hospice or hospice services offered in nursing homes.</p>	
5	<p>Chan, W. C., &amp; Epstein, I. (2012). Researching “good death” in a Hong Kong palliative care program: A clinical data mining study. <i>Omega</i>, 64(3), 203-222. doi: 10.2190/OM.64.3.b</p>	<p><b>Purpose Statement:</b> To assess the percentage of “good deaths” among Chinese cancer patients in palliative care programs; to describe the profile of these patients</p> <p><b>Research question:</b> What is the percentage of “good deaths” among Chinese cancer patients in palliative care programs,</p>	<p><b>Setting:</b> A ten-bed palliative care unit in Hong Kong</p> <p><b>Sampling method:</b> All patients matching study criteria</p> <p><b>Sample size:</b> 638</p>	<p><b>Design:</b> Retrospective</p> <p><b>Level of Evidence:</b> Level 4</p>	<p><b>Findings:</b> Twenty-one percent of participants achieved a good death as defined by the researchers. Longer time of palliative care was associated with greater achievement of good death (median 60 days of palliative care service compared to median 43 days among all participants). There was no significant difference between the good death group and the entire sample in initial physical status, so results that longer palliative care was associated with good death was further validated.</p> <p><b>Conclusion:</b> Perhaps as the result of physical and psychosocial</p>	<p><b>Recommendations:</b> Comparative research should be completed using a similar three-part definition of “good death.”</p> <p>End-of-life conversations should be initiated with younger patients so they may be more likely to achieve a “good death” if circumstances cause them to die earlier than expected.</p> <p>Hospitals should identify patients at risk for not achieving a “good death” and should intentionally direct palliative resources toward them.</p>	<p><b>Limitations:</b> The sample size was large, but the original data was not collected for this study. Thus, the researchers could not make definitive claims about cause-effect relationships between palliative care interventions and patient outcomes. Due to the ethics of assigning only some patients to palliative care services, this limitation is present throughout this paper’s studies. Further, the researchers acknowledged that the operational definition of death in this study – only based on three areas – is neither as detailed nor complex as in theoretical literature.</p>

	what is the profile of these patients?			benefits of palliative care, patients who received a greater number of days of palliative care services were more likely to achieve a good death. That is, they were more likely to report the absence of pain, the absence of anxiety, and the presence of open and honest communication with family.	<p>Earlier referral to palliative care services may improve patient outcomes.</p> <p>Patients' families should receive support to reduce anxiety, and thus, improve patient outcomes.</p> <p>More research directed toward the effect of palliative care is indicated, especially in China.</p>		
6	<p>Chen, C. Y., Thorsteinsdottir, B., Cha, S. S., Hanson, G. J., Peterson, S. M., Rahman, P. A., . . . Takahashi, P. Y. (2015). Health care outcomes and advanced care planning in older adults who receive home based palliative care: A pilot cohort study. <i>Journal of Palliative Medicine, 18(1)</i>, 38-44. doi:10.1089/jpm.2014.0150</p>	<p><b>Purpose Statement:</b> To evaluate the effect of home-based palliative care on hospital admissions, total hospital days, total emergency room visits in the six months following program entry, and the nature of advance directive planning.</p> <p><b>Research question:</b> What is the effect of home-based palliative care on hospital admissions, total hospital days, total emergency room visits in the six months following</p>	<p><b>Setting:</b> Palliative care homebound program in Rochester, Minnesota</p> <p><b>Sampling method:</b> All patients matching criteria</p> <p><b>Sample size:</b> 54</p>	<p><b>Design:</b> Retrospective</p> <p><b>Level of Evidence:</b> Level 4</p>	<p><b>Findings:</b> Ninety-two percent of control patients were admitted to the hospital at least once over a six month period, compared with only 33% of patients in the home-based palliative care program. In addition, both the average number of admissions and average number of days in the hospital were statistically lower among the palliative care group. On the other hand, there was no significant difference in emergency department visits. Every patient in the palliative care group except for one had advanced care directive documentation on file, compared with only 69% of patients in the control group. Similarly, all palliative care patients had documented conversations with healthcare providers about goals of care, compared with only 41% among non-palliative care patients.</p> <p><b>Conclusion:</b> The Palliative Care</p>	<p><b>Recommendations:</b> Patient preferences and goals of care should be reassessed as health conditions and prognosis change.</p> <p>More intimate and collaborative decision making with patients and family members may be necessary to help patients who are indecisive about preferences for future treatment.</p> <p>Documentation regarding patient preferences and advanced directives should be clear and specific.</p> <p>More research in larger, multi-center settings should be conducted to improve generalizability of conclusions</p>	<p><b>Limitations:</b> Despite advanced matching methodology, the researchers maintained that patients in the palliative care homebound program were nevertheless inherently different than patients in the control group. To minimize disparity, differences in comorbidities were adjusted using a generalized linear model, multivariate logistic model, and the Cox proportional hazard model, previously validated statistical analysis tools. In addition, many participants were transferred from a similar hospital-based program, so some care coordination and advanced care planning may have occurred prior to palliative care homebound program admission. Indeed, all of the patients enrolled in the program had already articulated their preferences with care and had DNR orders. Finally, the researchers acknowledged lack of generalizability due to the single-setting nature of this Minnesota pilot study.</p>

	program entry, and the nature of advance directive planning?			Homebound Program was associated with decreased hospital admissions and decreased total days in the hospital, but not with decreased emergency department visits. The palliative care program was also found to improve advanced care planning and conversations about patient goals.			
7	Enguidanos, S., Vesper, E., & Lorenz, K. (2012). 30-day readmissions among seriously ill older adults. <i>Journal of Palliative Medicine</i> , 15(12), 1356-1361. doi:10.1089/jpm.2012.0259	<p><b>Purpose Statement:</b> To investigate factors associated with 30-day hospital readmission among patients receiving a consultation from an inpatient palliative care team.</p> <p><b>Research question:</b> What are factors associated with 30-day hospital readmission among patients receiving a consultation from an inpatient palliative care team?</p>	<p><b>Setting:</b> Urban non-profit health maintenance organization medical center in Los Angeles County</p> <p><b>Sampling method:</b> All patients matching criteria</p> <p><b>Sample size:</b> 408</p>	<p><b>Design:</b> Retrospective</p> <p><b>Level of Evidence:</b> Level 4</p>	<p><b>Findings:</b> Ten percent of all participants were readmitted within 30 days of discharge. These patients were more likely to have been discharged to home without care or to a nursing facility. Although patients that were discharged to home without home care services or to a nursing facility made up 22.8% of the total sample (8.6% and 14.2%, respectively), these patients composed 56.1% of those readmitted within 30 days of discharge. In other words, those discharged without home care were 3.7 times as likely and those discharged to nursing facilities were 5 times as likely to be readmitted, compared with those discharged under hospice or home-based palliative care. Further, probability of death was highly associated with 30-day hospital readmission in the first of two regression models in this study.</p> <p><b>Conclusion:</b> Receipt of palliative care, rather than only palliative care consultation, is associated with lower 30-day readmission rates.</p>	<p><b>Recommendations:</b> The federal government lowered reimbursement rates for hospitals with high readmission rates, so improved access to home-based palliative care may be indicated.</p> <p>Improved follow-up with patients following palliative care consultation may improve patient outcomes in the case of disease progression and complication increases</p>	<p><b>Limitations:</b> The researchers acknowledged that the site investigated in the study has a notably impressive palliative care program, so the estimated magnitude of the problem may be far lower than most other sites. In addition, patients discharged to nursing facilities may have received some palliative care services, which may have skewed the data slightly. Finally, it is possible that some hospital readmissions were medically appropriate, but the researchers were unable to collect data to predict what extent this was the case.</p>

Heyland, D., Cook, D., Bagshaw, S. M., Garland, A., Stelfox, H. T., Mehta, S., Dodek, P., . . . Day, A. G. (2015). The very elderly admitted to the ICU: A quality finish? *Critical Care Medicine Journal*, 43(7), 1352-1360. doi: 10.1097/CCM.0000000000001024

<p><b>Purpose Statement:</b> To document life-sustaining interventions provided in the ICU and outcomes of care</p> <p><b>Research question:</b> What are life-sustaining interventions provided in the ICU and the resulting patient outcomes?</p>	<p><b>Setting:</b> ICUs of 24 Canadian hospitals</p> <p><b>Sampling method:</b> Convenience</p> <p><b>Sample size:</b> 1671</p>	<p><b>Design:</b> Prospective</p> <p><b>Level of Evidence:</b> Level 4</p>	<p><b>Findings:</b> Seventy-two percent of patients were receiving mechanical ventilation, and an additional 13% received vasopressors, dialysis, or both. Median hospital length of stay was 17 days, and median intensive care unit stay was 4 days. Thirty percent of patients remained in the intensive care unit for over one week. Patients identified as “frail” were less likely to receive mechanical ventilation, but they were equally likely to receive other life-sustaining treatments. Frail patients had similar time from intensive care unit admission to death, similar intensive care unit readmission rates, and similar hospital and intensive care unit length of stay. Eighty-four percent of patients whose families preferred comfort measures only received mechanical ventilation nonetheless, and average time from intensive care unit admission to death was 16 days among non-survivors.</p> <p><b>Conclusion:</b> Many older adults at the end of life are experiencing prolonged intensive care unit length of stay due to non-beneficial life-sustaining measures such as mechanical ventilation. Prolonged length of stay and use of life-sustaining measures is also associated with higher costs and limits the opportunity for beneficial intensive care to patients who are not at the end of life.</p>	<p><b>Recommendations:</b> Ensure consistency between patient end of life preferences and actual treatment initiated.</p> <p>Ensure that advance directives are considered when providing care to older adult patients, as many times aggressive life-saving measures are used in the very patients whose advance directive express the desire for these life-saving measures not to occur.</p> <p>Advance directives should be reflection-based and conversation-based for them to become more effective.</p> <p>Conversations about patient preferences for end of life care should occur before life-threatening illness occurs.</p> <p>Introduce campaigns such as the “Just Ask” campaign, which seeks to encourage healthcare providers to ask at-risk patients about their end of life preferences.</p> <p>Validated tools should be developed to identify which older adult patients would be least likely to benefit from intensive care unit interventions</p>	<p><b>Limitations:</b> There are a few reasons that the results of this study may not be generalizable. First, only participants 80 years or older were accepted, which contrasts with many of the other studies in this list that accepted patients who were 65 years and older. Many participants were Caucasian, and the study focused on the Canadian healthcare model. As such, the results may differ among non-white patients and patients in other health systems. The researchers did not collect data in regards to the content of advance directives, so the level to which certain treatment limitations were followed is unknown. One family member who was interviewed was not the legally-appointed substitute decision maker, but it is doubtful that this single change may have meaningfully impacted the results of this 1671-participant study. In addition, the researchers’ definition of prolonged dying was a somewhat arbitrary “greater than 7 days in the ICU.” Finally, there was no control group of younger adults or patients who were not admitted to the ICU.</p>
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<p>9 Horton, J. R., Morrison, R. S., Capezuti, E., Hill, J., Lee, E. J., &amp; Kelley, A. S. (2016). Impact of inpatient palliative care on treatment intensity for patients with serious illness. <i>Journal of Palliative Medicine</i>, 19(9), 936-942. doi:10.1089/jpm.2015.0240</p>	<p><b>Purpose Statement:</b> To examine the relationship between presence of palliative care programs and hospitals' average treatment intensity in the last six months of life</p> <p><b>Research question:</b> What is the relationship between presence of palliative care programs and hospitals' average treatment intensity in the last six months of life?</p>	<p><b>Setting:</b> National sample of hospitals</p> <p><b>Sampling method:</b> All hospitals matching criteria</p> <p><b>Sample size:</b> 295 hospitals with palliative care programs and 679 hospitals without palliative care programs</p>	<p><b>Design:</b> Retrospective</p> <p><b>Level of Evidence:</b> Level 4</p>	<p><b>Findings:</b> Statistically insignificant differences between hospital mean ICU LOS and mean length of hospice enrollment when comparing U.S. hospitals with and without palliative care programs</p> <p><b>Conclusion:</b> Palliative care programs may not be sufficient to impact ICU LOS or hospice length of enrollment among chronically ill older adults.</p>	<p><b>Recommendations:</b> Further research should investigate the impact of the prevalence of hospice and palliative care services on individual and regional health outcomes.</p> <p>Improved penetration of hospice and palliative care services may improve population outcomes</p> <p>Providers of all disciplines and educational levels should be trained in palliative care principles.</p> <p>Research regarding the effect of hospice and palliative care should be conducted in various settings – small and large, urban and rural, single-center and multi-center, inpatient and outpatient, nursing homes and home health.</p> <p>Improve access to palliative care programs and provider understanding of how to incorporate palliative knowledge and skills into routine care.</p>	<p><b>Limitations:</b> In the hospitals that were studied, the palliative care programs had been established for several years but were relatively small, limiting the impact of the research. Generalizability was limited in that outcomes of Medicare Advantage enrollees were not measured, and these enrollees are typically healthier than patients enrolled in traditional Medicare. In addition, surgical patients and patients with serious and complex medical problems were not included in the study, further limiting generalizability. Finally, the researchers only studied hospital-wide outcomes, so conclusions about the effect of hospice and palliative care interventions on an individual level were not made.</p>
<p>10 Hwang, S., Chang, H., Hwang, I., Wu, C., Yang, W., &amp; Li, C. (2013). Hospice offers more palliative care but costs less than usual care for terminal geriatric hepatocellular carcinoma patients: A nationwide study. <i>Journal of Palliative</i></p>	<p><b>Purpose Statement:</b> To analyze differences between hospice care and usual care</p>	<p><b>Setting:</b> National study in Taiwan</p> <p><b>Sampling method:</b> All patients</p>	<p><b>Design:</b> Retrospective</p> <p><b>Level of Evidence:</b> Level 4</p>	<p><b>Findings:</b> Hospice care was associated with reduced implementation of aggressive and invasive procedures, such as urinary catheterization, tube feeding, central venous catheter</p>	<p><b>Recommendations:</b> For hospitals that lack hospice and palliative care services, patients should be referred to other hospital systems where these services</p>	<p><b>Limitations:</b> The researchers were unable to compile descriptive data such as patient socioeconomic status, educational background, impressions received from physicians about hospice and palliative care, patient and family preferences, and life</p>

<p><i>Medicine</i>, 16(7), 780-785. doi:10.1089/jpm.2012.0482</p>	<p>for geriatric hepatocellular carcinoma patients</p> <p><b>Research question:</b> What are differences between hospice care and usual care for geriatric hepatocellular carcinoma patients?</p>	<p>matching criteria</p> <p><b>Sample size:</b> 729 hospice patients and 729 non-hospice patients</p>		<p>insertion, endotracheal intubation, cardiopulmonary resuscitation, hemodialysis, defibrillation, cardioversion, and esophageal balloon insertion. Hospice patients were more likely to receive symptom-management drugs such as opioids (77.7% versus 25.5% in the acute care group) and less likely to receive total parenteral nutrition when compared to non-hospice patients. In addition, total cost of care in the hospice group was an average of \$114 per day, compared with the non-hospice group of \$326 per day. In every assessed cost category (diagnoses, laboratory examinations, radiologic examinations, therapies, medications, and hemodialysis), the hospice group had lower expenses than the non-hospice group.</p> <p><b>Conclusion:</b> Hospice care is associated with shorter length of stay, fewer invasive procedures, and decreased cost of medical care. Hospice care patients were also more likely to be opioid analgesics, which contributes to quality of life. These results are especially significant for the Taiwanese population of focus because cultural barriers exist that cause many patients and their families to prefer acute care.</p>	<p>exist.</p> <p>Continue to challenge patient negative perceptions of hospice and palliative care by describing them as methods used to help patients die with dignity, alleviate pain and non-pain symptoms, and reduce aggressive and futile invasive procedures.</p>	<p>expectancy. Thus, the possible impact of these factors was not analyzed. In addition, quality of life outcomes were not measured on the national level, so further research in this setting is necessary.</p>
<p>11 Laguna, J., Goldstein, R., Allen, J., Braun, W., Enguidanos, S. (2012).</p>	<p><b>Purpose Statement:</b> To test the</p>	<p><b>Setting:</b> Middle-to-lower SES hospital in</p>	<p><b>Design:</b> Prospective, descriptive</p>	<p><b>Findings:</b> Among the 258 patients that indicated pain at baseline, 2</p>	<p><b>Recommendations:</b> There is a need for palliative care service</p>	<p><b>Limitations:</b> The power of the statistical analysis and generalizability were limited by the small</p>

<p>Inpatient palliative care and patient pain: Pre- and post-outcomes. <i>Journal of Pain and Symptom Management</i>, 43(6), 1051-1059. doi:10.1016/j.jpainsymman.2011.06.023</p>	<p>effectiveness of an interdisciplinary inpatient palliative care consultation program in the management of pain during hospitalization and 10 days following discharge</p> <p><b>Research question:</b> How effective is an interdisciplinary inpatient palliative care consultation program in the management of pain during hospitalization and 10 days following discharge</p>	<p>Los Angeles County</p> <p><b>Sampling method:</b> Convenience</p> <p><b>Sample size:</b></p>	<p><b>Level of Evidence:</b> Level 4</p>	<p>hour after consultation, 24 hours after consultation, and at discharge, mean pain scores were significantly reduced from baseline. There was no statistical difference in pain scores between 2 and 24 hours after consultation, but pain score at discharge was significantly lower than both. Among patients that reported pain at discharge, pain intensity scores increased significantly from discharge to 10 days post-discharge. Factors associated with increased pain from discharge to 10-days post-discharge were discharge to hospice and discharge to home with no care services (as opposed to discharge to skilled care facilities, home-based palliative care, and home with home health).</p> <p><b>Conclusion:</b> Inpatient palliative care may lead to immediate (within two hours) improvements in pain intensity scores, and reduced pain at discharge. Reduction in effective pain management decreases 10-days post-discharge, especially among patients discharged to hospice.</p>	<p>follow-up following discharge to ensure recommendations are followed and pain is continuing to be treated effectively</p> <p>Promote improved communication among providers to ensure continuity of care.</p> <p>Ensure analgesic administration remains consistent and “around the clock” as necessary during transitions of care.</p> <p>Providers should be proactive in education regarding analgesic medications to ensure that patients are compliant with pain relief recommendations.</p>	<p>sample size and lack of control group. Even though hospice care was associated with increased pain, this does not necessarily indicate that hospice care causes pain. Additionally, both regression models indicated the existence of factors affecting pain beyond those measured in the study. Thus, the increase or decrease in pain scores of patients throughout time could have been influenced by factors other than the inpatient palliative care consultation. The study also did not contain any data in regards to the analgesics used, so the role of medications in pain relief was not analyzed. Finally, the numeric pain scale used may not have been as effective for patients experiencing cognitive impairment or delirium.</p>
<p>12 Moorhouse, P., &amp; Mallerie, L. H. (2012). Palliative and therapeutic harmonization: A model for appropriate decision-making in frail older adults. <i>Journal of the American Geriatrics Society</i>, 60(12), 2326-2332. doi:10.1111/j.1532-5415.2012.04210.x</p>	<p><b>Purpose Statement:</b> To examine the effect of frailty on medical decision making</p> <p><b>Research question:</b> What is the effect of frailty on medical decision</p>	<p><b>Setting:</b> University hospital in Nova Scotia</p> <p><b>Sampling method:</b> First 150 patients to complete a voluntary program</p>	<p><b>Design:</b> Prospective</p> <p><b>Level of Evidence:</b> Level 4</p>	<p><b>Findings:</b> Of patients referred for general care planning, 93.7% were successful in making decisions about invasive procedures, interventions, and medications. Upon completion of the program, patients chose to decline 83.1% of previously scheduled invasive procedures and treatments. Ten percent of participants elected to receive end of life care at home.</p>	<p><b>Recommendations:</b> Create incentives for palliative care training certification</p> <p>Development of evidenced-based guidelines for palliative care promotion in specific disease processes.</p> <p>Contextualize risks and</p>	<p><b>Limitations:</b> The study had a relatively small convenience sample size of 150 patients, which limits the generalizability of the results. Although nearly half of the participants refused previously scheduled invasive procedures, there was no formal control group to support the conclusion that the palliative care program was the cause of this outcome; that is, the patients may have refused the procedures even had they not been a participant in the palliative care program.</p>

	making?	<b>Sample size:</b> 150		<p>Although 63% of patients indicated that resulting conversations were upsetting or emotionally charged, 100% of patients indicated that the program was helpful in care planning.</p> <p><b>Conclusion:</b> The Palliative and Therapeutic Harmonization model of decision-making led many patients to decline previously scheduled invasive procedures and make other decisions about care planning. In addition, a patient satisfaction survey indicated that participation in the program benefited advanced care planning.</p>	<p>benefits of proposed treatments in terms of frailty and prognosis.</p> <p>Randomized control trials assigning some patients to hospice and palliative care and others to traditional care would be unethical, but studies comparing different hospice and palliative services would be appropriate.</p>	
<p>13 Morandi, A., Vasilevskis, E., Pandharipande, P. P., Girard, T. D., Solberg, L. M., Neal, E. B., . . . Kripalani, S. (2013). Inappropriate medication prescriptions in elderly adults surviving an intensive care unit hospitalization. <i>Journal of the American Geriatrics Society</i>, 61, 1128-1134. doi:10.1111/jgs.12329</p>	<p><b>Purpose Statement:</b> To determine types of potentially and actually inappropriate medications, and associated risk factors among elderly ICU survivors</p> <p><b>Research question:</b> What are the types of potentially and actually inappropriate medications, and what are associated risk factors among elderly ICU survivors?</p>	<p><b>Setting:</b> Tertiary care medical center</p> <p><b>Sampling method:</b> Convenience</p> <p><b>Sample size:</b> 120</p>	<p><b>Design:</b> Prospective</p> <p><b>Level of Evidence:</b> Level 4</p>	<p><b>Findings:</b> Thirty-six percent of potentially inappropriate medications prescribed at discharge were classified as actually inappropriate medications including anticholinergic drugs, muscle relaxants, and antipsychotic medications. There was no statistical significance between administration of actually inappropriate medications and age, number of potentially inappropriate medications upon admission, comorbidity score, or length of stay.</p> <p><b>Conclusion:</b> None of the analyzed variables were found to be statistically significant risk factors of the prescription of actually inappropriate medications upon discharge. However, as hospice-bound patients were excluded from this study with</p>	<p><b>Recommendations:</b> More research should be conducted to determine the risk that PIMs are AIMs for patients exhibiting different disease processes and characteristics.</p> <p>Providers should evaluate the appropriateness of medications prior to discharge of older adults at the end of life.</p> <p>Utilize multidisciplinary teams to determine the appropriateness of medication prescriptions prior to discharge. Create electronic medical record software that automatically notifies clinicians of PIM prescription in care settings with lower availability of resources.</p>	<p><b>Limitations:</b> The major limitation to this study was that there is currently no research linking PIMs and AIMs to adverse patient outcomes, so increased risk of adverse outcomes following administration of these medications is merely theoretical. In addition, the process to determine AIMs involved a simple majority of opinions by the panelists, and bias may have been a factor. This was minimized in selecting panelists that were approximately the same age and lacked dominating personalities, but differences in clinical discipline (not measured in this study) could have also been a factor. In addition, the single-center nature of the study limits generalizability to areas markedly different from the study area. Finally, the Beers criteria was updated in 2012, after this study was already in progress, so the process of medication determination as PIMs and AIMs was somewhat outdated.</p>

				<p>the expectation that most potentially inappropriate medications were prescribed appropriately to this population, it can be predicted that hospice services may reduce the administration of actually inappropriate medications.</p>	<p>Medications prescribed in the ICU are often AIMs that require only temporary prescription. Physicians should reassess the need for medications prior to transfer out of the ICU.</p> <p>Conduct more research to determine the risk factors of AIMs rather than only research related to risk factors of PIMs, as many PIMs are medically indicated.</p>	
<p>14 Orsini, J., Butala, A., Saloman, S., Studer, S., Gadhia, S., Shamian, B., . . . Blaak, C. (2015). Prognostic factors associated with adverse outcome among critically ill elderly patients admitted to the intensive care unit. <i>Journal of the Japan Geriatrics Society</i>, 15(1) 889-894. doi:10.1111/ggi.12363</p>	<p><b>Purpose Statement:</b> To describe the clinical characteristics and outcome of a geriatric population admitted to the ICU</p> <p><b>Research question:</b> What are the clinical characteristics and outcomes of geriatric patients admitted to the ICU?</p>	<p><b>Setting:</b> Inner city hospital in Brooklyn, NY</p> <p><b>Sampling method:</b> All patients matching criteria</p> <p><b>Sample size:</b> 71</p>	<p><b>Design:</b> Prospective</p> <p><b>Level of Evidence:</b> Level 4</p>	<p><b>Findings:</b> Sixty-eight percent of patients received mechanical ventilation for a median length of 5 days. Sixty-six percent of patients underwent other invasive procedures, such as triple-lumen catheter and arterial catheter insertions. The total median cost of intensive care unit interventions was \$11,700 per patient, and 18% of participants died while admitted to intensive care unit.</p> <p><b>Conclusion:</b> Aggressive life-sustaining interventions directed toward older adults at the end of life may be both futile and inappropriate. In the apparent absence of palliative care, most patients in the study received mechanical ventilation and underwent other invasive procedures. High cost and death in the intensive care setting may also be the result of the apparent absence of palliative care consultation.</p>	<p><b>Recommendations:</b> Palliative care services are should be focused on the intensive care and emergency settings.</p> <p>Criteria for elderly admission to the intensive care unit should be developed, validated, and accepted widely.</p> <p>More research can be done on the predictors of longterm survival among geriatric patients discharged from the intensive care unit.</p>	<p><b>Limitations:</b> As one of the twenty studies evaluated in this paper, this study was meant to represent the patient outcomes in the absence of palliative care interventions. However, the researchers of this study noted that palliative care consultation services work closely with the intensive care unit staff. The reality that aggressive measures were used for elderly patients and often resulted in adverse outcomes, in combination with the researchers' comment that most intensive care physicians admitted patients without regard to hospital admission criteria is evidence that existing palliative care resources may have been ignored. In addition, in the researchers' discussion, it was noted that the hospital's high proportion of patients over eighty years (higher compared to similar studies) may have indicated that age was not considered a reason for refusal of intensive care unit admission. That said, it is possible that some palliative care consultation may have been a factor in this study – a study that for the purposes of this paper was meant to represent the absence of palliative care interventions. Although palliative care services were available to patients, only 25.4% of participants had advance directives, indicating that existing palliative care services might have been underutilized. However, physician perspective on advance directives as well as patient cultural</p>

						<p>background may have also impacted advance directive use. Limited medical resources in other areas of the hospital might have also been a factor in motivating intensive care unit staff to admit patients without regard to age.</p> <p>There are three additional reasons that the results may not be generalizable: sixty-two percent of participants were women, the sample size was only seventy-one, and the research was conducted in a single hospital. Furthermore, this study was exclusively observational, so the researchers were unable to make strong claims about whether certain interventions were the cause of specific patient outcomes.</p>
<p>15 Parker, S. M., Remington, R., Nannini, A., &amp; Cifuentes, M. (2013). Patient outcomes and satisfaction with care following palliative care consultation. <i>Journal of Hospice &amp; Palliative Nursing, 15</i>(4), 225-232. doi:10.1097/NJH.0b013e318279f4ce</p>	<p><b>Purpose Statement:</b> To investigate the effect of palliative care on patient outcomes and satisfaction.</p> <p><b>Research question:</b> How did patients rate their satisfaction with the care provided during the consult? How did the patient or family rate the patient's comfort? What were the patient outcomes after the consult visit(s)?</p>	<p><b>Setting:</b> Large community-based hospice in New England serving urban and suburban populations</p> <p><b>Sampling method:</b> Convenience</p> <p><b>Sample size:</b> 110 palliative care patients and 100 randomly-selected palliative care charts</p>	<p><b>Design:</b> Descriptive</p> <p><b>Level of Evidence:</b> Level 4</p>	<p><b>Findings:</b> Seventy-five percent of palliative care patients had documented conversations about transitions in care. There was inconsistent data regarding pain improvement following palliative care consultation, perhaps because pain management recommendations were not followed in 31% of patients. There was no correlation between number of palliative care consultation visits and advance directive discussions. Patient and/or family satisfaction studies had positive results: 99.1% satisfaction with treatment with dignity and respect and 92.5% satisfaction with achievement of comfort.</p> <p><b>Conclusion:</b> Palliative care consultation is associated with high patient and family satisfaction, advanced care planning, and conversations about transitions in care. However, there was inconsistent data regarding</p>	<p><b>Recommendations:</b> Increase palliative care involvement in the process of discharge and other care transitions, and involve palliative care in skilled nursing facilities and assisting living facilities.</p> <p>Involve nurse practitioners and other providers in the process of pain management and care planning following discharge.</p>	<p><b>Limitations:</b> The study lacked a formal method of linking satisfaction with the transition in care, and there was no measurement of patient outcomes over a longer period of time. In addition, measuring patient satisfaction is a particularly inefficient way to measure quality of life, as patient perceptions of care, expectations, and experiences may vary. Despite three separate mailings and telephone reminder to return the survey, the study had a low response rate after six months of data collection.</p>

				pain management.		
16 Pereira, S., Kozikowski, A., Pekmezaris, R., Sunday, S., Mir, T., Saad, M., . . . Wolf-Klein, G. (2015). The relationship between the timing of a palliative care consult and utilization outcomes for ventilator-assisted intensive care unit patients. <i>Palliative and Supportive Care</i> , 15, 217-221. doi:10.1017/S147895151300103X	<p><b>Purpose Statement:</b> To investigate the relationship between timing of palliative care consultation and length of stay and pharmacy costs</p> <p><b>Research question:</b> What is the relationship between timing of palliative care consultation and length of stay and pharmacy costs?</p>	<p><b>Setting:</b> New York metropolitan academic hospital</p> <p><b>Sampling method:</b> All patients matching criteria</p> <p><b>Sample size:</b> 90</p>	<p><b>Design:</b> Retrospective</p> <p><b>Level of Evidence:</b> Level 4</p>	<p><b>Findings:</b> Earlier palliative care consultation was associated with fewer total ventilator days, shorter total length of stay. Timing of consultation had no effect on post-PCC ventilator days or days to death following extubation. Pharmacy costs were reduced by an average of \$200.36 per day; there was an overall decrease in cost of treatment-related drugs and an overall increase in cost of drugs for symptom management. There was also an increase in continuous intravenous opioid infusion following palliative care consultation.</p> <p><b>Conclusion:</b> Earlier timing of palliative care consultation is associated with shorter length of stay and fewer days on mechanical ventilation. There is a simultaneous decrease in cost and improvement in quality of care related to palliative care consultation.</p>	<p><b>Recommendations:</b> Continue to pursue cost-effective methods of improving care for older adult patients at the end of their lives.</p> <p>This study should be replicated at larger, multicenter hospitals to continue to assess the impact of the timing of palliative care consultation on patient outcomes and cost.</p>	<p><b>Limitations:</b> The primary limitations in this study were similar to the others in this list: the inability to make causal inferences due to nonrandomization and lack of generalizability due to the study's single-center nature.</p>
17 Reyes-Ortiz, C. A., Williams, C., & Westphal, C. (2015). Comparison of early versus late palliative care consultation in end-of-life care for the hospitalized frail elderly patients. <i>American Journal of Hospice &amp; Palliative Medicine</i> 32(5) 516-520. doi:10.1177/1049909114530183	<p><b>Purpose Statement:</b> To examine the effects of early palliative care consultation versus late palliative care consultation on number of days from day of consult to discharge.</p> <p><b>Research</b></p>	<p><b>Setting:</b> Wayne State University / Oakwood Hospital &amp; Medical Center</p> <p><b>Sampling method:</b> All patients matching criteria</p> <p><b>Sample size:</b> 300 patients</p>	<p><b>Design:</b> Retrospective</p> <p><b>Level of Evidence:</b> Level 4</p>	<p><b>Findings:</b> Early palliative care consultation was associated with fewer hospital deaths (13.7%, compared to 21.2% in late palliative care consultation) and higher hospice-related deaths (53.3%, compared to 45.4% in late palliative care consultation). Early palliative care consultation was also associated with shorter overall length of stay and fewer days from consultation to</p>	<p><b>Recommendations:</b> Continue research of the effect of hospice and palliative care on DCDAYS, as this may reflect a more direct effect of interventions than total LOS.</p> <p>Refer to palliative care consultation earlier in the disease process, and initiate end-of-life conversations early.</p>	<p><b>Limitations:</b> The data used were designated for administrative purpose but not for research, and as a result, factors such as stage of cancer or prognosis of disease were not controlled. The uncontrolled variables could potentially have influenced the decisions about PC or hospice care of the elderly patients. Additionally, physicians' attitudes toward palliative care and end-of-life issues may have varied, impacting referrals.</p>

	<p><b>question:</b> What is the effect of early palliative care consultation versus late palliative care consultation on number of days from day of consult to discharge?</p>	<p>with early palliative care consultation and 231 patients with late palliative care consultation</p>		<p>discharge.</p> <p><b>Conclusion:</b> Early palliative care is associated with lower length of stay, lower days from consultation to discharge, lower inpatient deaths, and higher hospice admission.</p>	<p>Create routine screening guidelines related to appropriateness of palliative care consultation</p>	
<p>18 Stabenau, H. F., Morrison, L. J., Gabbauer, E. A., Leo-Summers, L., Allore, H. G., &amp; Gill, T. M. (2015). Functional trajectories in the year before hospice. <i>Annals of Family Medicine</i>, 13(1), 33-40. doi:10.1370/afm.1720</p>	<p><b>Purpose Statement:</b> To identify distinct functional trajectories in the year before hospice, determine how patients differ, and evaluate the association between trajectories and outcomes.</p> <p><b>Research question:</b> What are the trajectories in the year before hospice, how do patients differ, and what is the association between trajectories and outcomes?</p>	<p><b>Setting:</b> New Haven, Connecticut community</p> <p><b>Sampling method:</b> All patients matching criteria</p> <p><b>Sample size:</b> 213</p>	<p><b>Design:</b> Descriptive</p> <p><b>Level of Evidence:</b> Level 5</p>	<p><b>Findings:</b> Five distinct functional trajectories in the year before hospice were identified, but there was no significant difference in survival between groups. The median survival after hospice admission was 14 days among all participants. Late admission to hospice was associated with short survival following admission.</p> <p><b>Conclusion:</b> Regardless of functional trajectory in the year before hospice, many older adults receive hospice services too late, as evidenced by short survival following hospice admission.</p>	<p><b>Recommendations:</b> Promote palliative care consultation and hospice enrollment in non-cancer patients experiencing unofficial diagnoses such as frailty.</p> <p>Initiate efforts to education providers, families, and patients about poor prognosis related to progressive disease or disability.</p> <p>Improve availability of palliative care programs regardless of prognosis and treatment decisions.</p>	<p><b>Limitations:</b> The sample size for this study was considerably low, leading to low statistical power for some comparisons. However, due to the prospective and longitudinal nature of this study, it would be difficult to replicate in larger populations over an extended period of time. In addition, it is unknown whether the patients received palliative services before the start of hospice care. There was also no data on the potential unmet needs at the end of life among patients who had not been admitted to hospice, limiting conclusions about the effect of hospice care on burden of disability at the end of life. The parent study excluded 8 patients with terminal illnesses, so the actual number of hospice cases in the current study may have been slightly higher. Finally, the single-center nature of the study limited generalizability of results.</p>
<p>19 Starks, H., Wang, S., Farber, S., Owens, D.A., Curtis, J.R. (2013). Cost savings vary by length of stay for inpatients receiving palliative care consultation services. <i>Journal of Palliative Medicine</i>, 16(10), 1215–1220. doi: 10.1089/jpm.2013.0163</p>	<p><b>Purpose Statement:</b> To examine cost savings for patients who receive palliative care consultation</p>	<p><b>Setting:</b> Two large academic medical centers</p> <p><b>Sampling method:</b> All patients</p>	<p><b>Design:</b> Retrospective</p> <p><b>Level of Evidence:</b> Level 4</p>	<p><b>Findings:</b> For stays 1-7 days, costs were \$2141 (13%) lower for all palliative care patients; for stays 8-30 days, costs were \$2870 (4.9%) lower for all palliative care patients; for stays greater than 30 days,</p>	<p><b>Recommendations:</b> Screen for patients who can benefit from palliative care services soon after admission.</p>	<p><b>Limitations:</b> Estimated cost savings was likely conservative, as propensity matching controlled the effect of decreased LOS on cost. Timeliness of palliative care consultation is also a factor in resulting cost of care, but this was not measured in this study. As with other studies, physician</p>

	<p>during short, medium, and long hospitalizations.</p> <p><b>Research question:</b> What is the effect of varying lengths of stay on cost savings among patients receiving palliative care consultation?</p>	<p>matching criteria</p> <p><b>Sample size:</b> 1815 patients palliative care patients and 1790 matched patients not receiving palliative care consultation</p>		<p>there was no statistically significant difference in cost for palliative care patients.</p> <p><b>Conclusion:</b> Palliative care can reduce cost for short and medium LOS. Cost is unaffected in long LOS perhaps due to more aggressive care preferences among patients whose LOS is more than a month</p>		<p>preference in regards to palliative care referrals may vary, potentially skewing the results. Finally, patients receiving palliative care interventions had higher rates of metastatic cancer despite propensity matching, which may have further impacted cost of care.</p>
<p>20 Wu, M.F., Newman, M.J., Lasher. A., Brody, A.A. (2013). Effects of initiating palliative care consultation in the emergency department on inpatient length of stay. <i>Journal of Palliative Medicine</i>, 16(11), 1362-1367. doi: 10.1089/jpm.2012.0352</p>	<p><b>Purpose Statement:</b> To investigate the effect of pre-admission palliative care consultation on length of stay.</p> <p><b>Research question:</b> What is the effect of pre-admission palliative care consultation on length of stay?</p>	<p><b>Setting:</b> California Pacific Medical Center in San Francisco</p> <p><b>Sampling method:</b> All patients matching criteria</p> <p><b>Sample size:</b> 1385 post-admission consultation patients, 50 pre-admission consultations</p>	<p><b>Design:</b> Retrospective</p> <p><b>Level of Evidence:</b> Level 4</p>	<p><b>Findings:</b> Palliative care consultation initiated in the emergency department was associated with statistically significant reduction in LOS by 3.6 days</p> <p><b>Conclusion:</b> Early initiation of palliative care consultation is associated with decreased LOS</p>	<p><b>Recommendations:</b> Move palliative care consultations sooner after admission and even incorporate them into the emergency department. Conduct research on the effect of palliative care consultation in the emergency department on provider satisfaction and outcome of consultation.</p> <p>Seek innovative methods of patient, provider, and family education related to the benefits of hospice and palliative care services.</p> <p>Given the time sensitive and often chaotic nature of the emergency department setting, more research should be conducted to determine the most effective methods of palliative care consultation in the emergency department.</p>	<p><b>Limitations:</b> Despite limiting selection bias using propensity matching to control patients, lack of randomization made it difficult to accurately determine effects of the intervention. In addition, the intervention group was significantly smaller than control group, limiting the researchers' ability to predict the actual effect of palliative care consultation on LOS.</p> <p>A unique organizational error related to resource availability at one of the study's data collection sites may have also impacted outcomes for that subset of patients. Finally, it is possible that patients visited emergency departments of other hospital systems, which were not measured in this study.</p>