

# Economic implications of end-of-life care in the ICU

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### **Purpose of review**

Advance care planning and palliative care interventions can improve the quality of end-of-life care by reducing unwanted high intensity care at the end of life. This may have important economic implications and may reduce the financial burden of patients' families. We review the literature to examine the impact advance care planning and palliative care has on ICU utilization, specifically ICU admissions and ICU length of stay (LOS), and to provide insight into ways to reduce costs and financial burden of care while simultaneously improving quality of care.

#### **Recent findings**

We identified three studies assessing the impact of palliative care consultation on ICU admissions for patients with life-limiting illness; all three demonstrate reduced ICU admissions for patients receiving palliative care consultation. Among 16 studies evaluating ICU LOS as an outcome, five report no change and 11 report decrease in LOS for patients receiving advance care planning or palliative care. These studies are heterogeneous in design and target population; however, a trend toward reduced ICU utilization exists.

#### Summary

Advance care planning and palliative care can reduce ICU utilization at the end of life. The degree to which reducing ICU utilization decreases emotional and financial burden of end-of-life care for patients and families is unknown.

#### Keywords

critical illness, economics, end-of-life care, palliative care

## INTRODUCTION

In the United States, one in five adults die during a hospitalization that includes a stay in the ICU, and 25% of our healthcare costs are spent on the 6% of people who die each year [1–3]. Our aging population, coupled with advances in management of acute and chronic illness, has led to a steadily increasing number of critical care beds and increasing costs associated with critical care [1,4,5]. In 2005, in the United States, critical care costs were estimated to be \$82 billion, accounting for 13% of inpatient hospital costs [4,5]. The United States spends more hospital resources on critical care medicine than any other country, as evidenced by its having among the highest ratios of ICU-bed: population (20 ICU beds per 100k) and ICU: hospital bed (nine per 100 hospital beds) in the world [4].

According to Medicare claims data, ICU use in the last 30 days of life increased between 2000 and 2009 despite public opinion surveys reporting that most patients would prefer to die at home, if diagnosed with a terminal illness [6,7]. This apparent inconsistency raises concern about the use of potentially unwanted intensive care at the end of life. Additionally, costly interventions to support critically ill patients may be ineffective and can cause significant discomfort. For example, endotracheal tubes, intravascular lines, feeding tubes, and restraints may reduce mobility, ability to communicate, and autonomy and may cause pain [8]. Importantly, this care at the end of life may not be consistent with patient preferences and values, and may place unnecessary emotional, physical, and financial burden on dying patients and their family members.

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# **KEY POINTS**

- Advance care planning and palliative care interventions may have the ability to improve the quality of dying while simultaneously reducing overall costs.
- Evidence suggests that advance care planning and palliative care interventions may reduce intensity of care at the end of life by reducing ICU LOS and ICU admissions.
- Future research is needed to better understand how reducing unwanted intensive care at the end of life impacts the financial burden placed on family members of dying patients.

Interventions, including early advance care planning, time-limited trials [9], and palliative care consultation, seek to ensure that care at the end of life remains patient-centered and is respectful of individual preferences and values [10]. There is evidence to suggest that ensuring care for patients with a high risk of death remains patient-centered can lead to a reduction in intensity of care near the end of life; for example, there is emerging evidence that advance care planning early during an acute care hospitalization can reduce ICU admissions [11–13] and that time-limited trials and proactive early palliative care consultation in the ICU can reduce the length of stay (LOS) and intensity of treatment for patients who die in the ICU [14<sup>•</sup>].

The rationale for improving palliative care for patients with, or at risk for, critical illness can be considered in three areas: first, improving quality of care and thereby improving patient and family outcomes; second, reducing the overall costs of care by reducing unwanted high intensity care at the end of life; and third, reducing the financial burden of end-of-life care on patients' families by reducing unwanted intensity of care. We believe that the first rationale above must be the primary rationale and that the latter two are only relevant if they are achieved through improving quality and ensuring that patients receive the care they would choose if truly informed about all their options. In this review, we will explore the financial implication of the latter two rationales. We will first review the current literature to better understand the impact that advance care planning, primary palliative care (by ICU clinicians), and specialty palliative care consultation (by palliative care or ethics consultants) have on ICU utilization, specifically ICU admissions and ICU LOS, as this may have important economic implications and provide insight into ways to reduce costs and the financial burden of care while simultaneously improving the quality of care at the end of life and quality of dying. We will then explore the potential financial burden of high intensity care at the end of life on patients' families and the ethical implications of considering this burden.

In the United States Institute of Medicine report on *Approaching Death: Improving Care at the End of Life*, various strategies to reduce costs at the end of life were put forth, including the following: broader use of hospice care, consumer choice strategies, futility guidelines, and expanded use of advanced directives and advance care planning [15]. Advance care planning and palliative care interventions may have the potential to improve the quality of end-oflife care and quality of dying while simultaneously reducing costs by decreasing intensive therapy at the end of life to match care with the goals and preferences of informed patients. We will review the current literature evaluating the effect of these interventions on ICU utilization.

# **STUDIES EVALUATING ICU ADMISSIONS**

Few studies in the existing literature have reported on the impact of palliative care consultation and advance care planning on ICU admissions. We found three trials, all assessing palliative care consultation, that reported on the effect of palliative care consultation on ICU admissions. All demonstrated a significant reduction in patients who received palliative care consultation for patients with life-limiting illness when compared with similar patients who did not receive palliative care consultation. Among these three trials, one was a randomized trial [11] and two were retrospective observational studies [12,13]. The randomized trial by Gade et al. [11] included adult patients hospitalized with at least one life-limiting diagnosis and whose attending physician indicated they 'would not be surprised if the patient died within 1 year', whereas the Penrod et al. [13] 2006 study included decedents only. Both of these studies reported similar relative risk reductions in ICU admission (50 and 51%, respectively). The second observational study conducted by Penrod *et al.* [12] included any veteran admitted to one out of five Veterans Affairs hospitals with at least one advanced disease. The relative risk reduction for this group was 11%, suggesting that the degree of impact from palliative care consultation is heavily influenced by the selection of the patient population. Studies selecting those at highest risk of death showed a larger relative risk reduction.

# STUDIES REPORTING ON ICU LENGTH OF STAY

We found 16 studies evaluating ICU LOS as an outcome for various types of advance care planning

and palliative care interventions. Settings and targets for interventions were diverse, as were methods and types of trials. Five of these trials reported no change in LOS in patients receiving advance care planning or a palliative care intervention compared to usual care; 11 trials reported a reduction in LOS.

# Studies reporting no change in length of stay

Five trials reported no change in ICU LOS in patients receiving advance care planning or a palliative care intervention compared to usual care. Project ENABLE II, conducted by Bakitas et al. [16], was designed to improve palliative care for patients with advanced cancer in the outpatient setting. This study randomized patients to a multicomponent palliative care intervention consisting of four weekly educational sessions: ICU LOS did not differ when compared with the control group receiving usual care [16]. Andereck et al. [17] investigated whether the proactive intervention of a clinical ethicist in patients with prolonged ICU LOS  $(\geq 5 \text{ days})$  in a mixed medical/surgical ICU setting reduced ICU LOS. Patients in both the intervention and control arms had the same number of ICU days. In a multicenter cluster randomized controlled trial conducted by Curtis *et al.* [18], a quality improvement intervention targeted at hospitals and clinicians to integrate palliative care in the ICU also did not result in a significant decrease in LOS. Shelton et al. [19] evaluated the effect of adding a full-time family support coordinator to a surgical ICU team in a pre-post study design; no differences in LOS were observed in the preimplementation versus postimplementation period. Lastly, Daly et al. [20] enrolled patients from five different ICUs and evaluated the effectiveness of an intensive communication strategy involving proactive multidisciplinary family conferences using a pre-post design; there were no significant differences in ICU LOS.

# Studies reporting a reduction in length of stay

Eleven studies reported a reduction in ICU LOS for patients who received an advance care planning or palliative care intervention (either primary palliative care by ICU clinicians or specialty consultation inclusive of palliative care and ethics consultation). One of these studies involved patient-centered interventions taking place outside of the ICU setting, enrolling medical inpatients age 80 years and older for an advance care planning intervention [21]. In this randomized trial, Detering *et al.* [21] assessed the impact of advance care planning on end-of-life care in elderly hospitalized patients. They randomized eligible patients admitted under internal medicine, cardiology, or respiratory medicine in a large university hospital. Upon request from the authors, we were able to obtain ICU LOS data as this outcome was not reported in the original manuscript; mean LOS was 10.9 days in the control arm and 5.3 days in the intervention arm [21].

The remaining 10 studies evaluated interventions that took place in the ICU setting. Two separate randomized trials conducted by Schneiderman *et al.* [22,23] examined the effect of routine ethics consultation, enrolling patients in whom value-related treatment conflicts arose. Both of these studies of routine ethics consultation in the ICU (one single-center study and one multicenter study) demonstrated significant reductions in ICU LOS for decedents in the intervention group as compared to usual care. Neither trial found a difference in ICU LOS for patients who survived to hospital discharge.

Eight of the studies reporting a decrease in ICU LOS associated with a palliative care intervention were nonrandomized studies using historical or concurrent controls. Ahrens et al. [24] evaluated the impact of a communication team consisting of a physician and clinical nurse specialist; patients in the intervention group had shorter LOS compared to the control group receiving usual care. Campbell and Guzman's [25] study of routine palliative care consults for patients with global cerebral ischemia after cardiopulmonary resuscitation using historical controls also found a decrease in LOS. In this same study, patients with multisystem organ failure did not spend a significantly longer time in the ICU when compared with historical controls receiving usual care; however, when assessed from the onset of multiple-system organ failure, there was a reduction in days in the ICU prior to death [25]. The following year, Campbell and Guzman [26] published another study of patients with advanced dementia using historical controls and found that proactive case finding facilitated by an inpatient palliative care service led to a significant reduction in ICU LOS. Using nonrandomized controls, Dowdy et al. [27] reported a reduction in LOS when the ethics service intervened proactively after patients received more than 96h of continuous mechanical ventilation. In a single-center study, Curtis et al. [28] evaluated the impact of a quality improvement intervention targeted to ICU personnel to improve palliative care in the ICU; median ICU LOS was shorter in the postimplementation period. This difference was not observed in the follow-up multicenter cluster randomized controlled trial [18]. Mosenthal et al. [29] evaluated the impact of integrating a structured palliative care intervention, consisting of assessment of patient prognosis and

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preferences, an interdisciplinary family meeting, and family bereavement support, into standard care in a trauma ICU. Among decedents, median LOS also decreased in the postimplementation period [29].

Lilly *et al.* [30] evaluated the impact of a multidisciplinary family meeting held within 72 h of admission to the medical ICU; they found a reduction in median LOS in the postimplementation phase when compared with the baseline period. However, the multicenter study using this same intervention by Daly *et al.* [20] did not show reduction in ICU LOS. Norton *et al.* [31] evaluated the impact of proactive palliative care consultation for patients admitted to the medical ICU and identified to be at high risk of death. This study, using a pre-post design, found a significant reduction in ICU LOS when compared with usual care [31].

# Summary of studies reporting on ICU utilization

All three studies reporting on ICU admissions involved an intervention targeted directly at the patient or provider, rather than on a system level. All three demonstrated a reduction in ICU admissions in patients receiving a palliative care consultation.

Although the results for studies reporting on ICU LOS were less consistent, a trend toward a reduction in the LOS for patients receiving an advance care planning or palliative care intervention seems apparent. Additionally, interventions that were targeted directly at providers and patients at the highest risk of death appeared to be more effective than interventions targeted at the ICU or hospital level.

# Financial burden of high intensity care at the end of life

Chronic and terminal illnesses have serious financial consequences for patients and their families [15]. These financial consequences stem from both out-of-pocket medical expenses and reduced patient or family income that results from decreased working hours or job loss because of illness or demands of caring for an ill family member [15]. Seriously ill patients and their families have reported several end-of-life priorities, one of which is having healthcare costs covered to avoid placing a financial burden on loved ones [32,33]. Despite this finding that minimizing the financial burden of end-of-life care is a top priority for dying patients, little is known about the costs of dying, including what aspects are most concerning to which types of patients, how informed patients are about the costs of high intensity care at the end of life, and, importantly, whether there are ways to improve the quality of dying by addressing and reducing this financial burden. Recent research has demonstrated that insurance status is an important mediator of the relationship between ICU costs and family-rated quality of dying, suggesting that financing of care influences how families perceive quality of dying and satisfaction with care [34<sup>•</sup>]. Specifically, this study found that for patients who were uninsured or underinsured, high costs of care at the end of life were associated with higher ratings of quality of dying, whereas there was no association for patients with Medicare or private insurance [34<sup>•</sup>].

Marshall *et al.* [35] reported that spending in the last year of life for decedents represents a substantial portion of liquid wealth. Although the majority of end-of-life care costs are financed by public programs, especially Medicare, there is strong evidence that out-of-pocket expenditures are growing over time [15,36]. Using data from the Health and Retirement Study, Marshall et al. [35] found that out-ofpocket expenditures near the end of life were large relative to the decedent's median nonhousing wealth. The degree to which hospital bills and reducing ICU LOS and ICU admissions can impact this financial burden is unknown and worthy of future investigation. Importantly, the primary goal must be to improve the quality of care and the quality of dying while providing care that is consistent with patient preferences and values. In addition, it is important to acknowledge and recognize that the financial burden for patients and families and the potential to reduce their costs may not align with the financial burdens and incentives of either the hospital or healthcare system.

Consideration of the financial burden on family members raises important issues of ethics and justice. Incorporating financial costs into decisions made about end-of-life care raises concern in situations in which conflicts of interest between surrogate decision makers and patients or physicians may exist. Ideally, patients with terminal or chronic illness admitted to the ICU have had previous discussions about values, goals, and preferences for end-of-life care early in the course of their disease so that well documented goals of care exist to guide surrogate decision makers and physicians. Often times, however, this is not the case. Good communication and shared decision making may help reveal situations in which potential conflicts of interest may exist. In a study investigating conflicts between physicians' practices and patients' wishes, Asch et al. [37] concluded that physicians do not reflexively limit or continue life-sustaining treatments based solely on patients or surrogates' requests. These requests are one of many factors,

including assessments of prognosis, and perceptions of other ethical and legal guidelines, that help guide decision making [37]. Additionally, one of the goals of good communication and family engagement is to try and ascertain patients' thoughts on quality-of-life values before any surrogate decisions are made on the patients' behalf [38]. This helps to evaluate the appropriateness of decisions in a larger context.

There are also important issues of justice that must be considered when considering the role of financial burden in decision making about intensity of care at the end of life. The intensity of care and the quality of care that seriously ill patients and their families receive should not be on the basis of ability to pay or ability to weather financial burden, rather it should be on the basis of patient values, goals, and preferences for what constitutes the best quality of end-of-life care and quality of dying. Discussing costs of care for critically ill and dying patients is a sensitive and controversial topic. However, patients have the right to be informed of all of their options and for patients who consider the financial burden of care a top priority, they have the right to be informed about the financial consequences of care as well. Importantly, the concept of rationing care is not what is at play here. Rationing of care is defined as denying a potentially beneficial treatment to a patient on the grounds of scarcity [39,40]. Advance care planning and palliative care interventions seek to individualize care and put decision making in the hands of informed patients. The goal here is to reduce unwanted intensive care at the end of life, not limit it for patients who desire it.

### CONCLUSION

Studies investigating the effect of advance care planning and palliative care consultation on ICU utilization suggest that these interventions have the potential to reduce intensity of care at the end of life by reducing ICU admissions and decreasing ICU LOS. Although the economic implications of this are unknown, providing care that is consistent with patient values and preferences can improve the quality of end-of-life care and the quality of dying. Future research is needed to better understand whether or not advance care planning and palliative care consultation have the ability to improve care while simultaneously decreasing overall costs. In addition, such interventions may also provide an opportunity to reduce the financial burden on the family members of these patients. Although reduction in financial burden should not be the primary rationale for palliative care interventions, it may be a useful secondary benefit provided that patients are receiving the care they would choose if fully informed and that the implementation of palliative care improves quality of care and improves patient and family outcomes. As we transition to the Accountable Care Organization environment, interventions that have the ability to improve quality of care delivered and reduce healthcare costs at the same time will be of special interest.

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# **Conflicts of interest**

The authors have no conflicts of interest to declare.

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660 www.co-criticalcare.com

Volume 20 • Number 6 • December 2014

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