

Trend of Decreased Length of Stay in the Intensive Care Unit (ICU) and in the Hospital with Palliative Care Integration into the ICU

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ABSTRACT

Context: Is a decrease in length of stay (LOS) in the intensive care unit (ICU) and hospital possible with the implementation of a structured, palliative care, quality-improvement program in the ICU?

Objective: Incorporate palliative care into the routine ICU workflow to increase the numbers of palliative care consultations, improve end-of-life care in the ICU, and demonstrate an impact on ICU and/or hospital LOS.

Design: A program was developed that followed recommendations from the Center to Advance Palliative Care's *Improving Palliative Care in the ICU* project. This program included selecting trigger criteria and a care model, forming guidelines, and developing evaluation criteria. The early identification of multiple measures led to proactive meetings with ICU patients' families and/or palliative care consultations.

Main Outcome Measures: Early identification of advance directives, code status, goals of care, and ICU LOS and hospital LOS.

Results: A comparison between pre- and postintervention data showed positive trends in measured outcomes, including increased early identification of advance directives, code status, and goals of care along with a decrease in ICU LOS and hospital LOS. In addition, the number of ICU family meetings and palliative care consultations increased.

Conclusion: It was concluded that providing palliative care in the ICU is feasible and may decrease both ICU LOS and overall hospital LOS.

INTRODUCTION

Hospital-based palliative care services have been evolving since the late 1980s, and as of 2008, approximately 31% of all US hospitals provided some type of inpatient palliative care.^{1,2} Palliative care is medical care that enhances quality of life for patients living with serious advanced illness by helping to align their treatment choices with their values. The World Health Organization defines *palliative care* as an approach that improves the quality of life of patients and their families facing problems associated with life-threatening illness.³ This is achieved through the prevention and relief of suffering by means of early identification, assessment, and treatment of pain and other physical, psychosocial, and spiritual problems.^{3,4}

Numerous reports have examined the effects of palliative care consultations on various outcome measures in the intensive care unit (ICU). Outcomes include the length of stay (LOS) for both the hospital and ICU, but controversy surrounding the potential impact of LOS on a decrease in overall hospital cost remains. A decrease in LOS resulting in an attenuation of hospital costs without compromising quality of care is arguably beneficial because most hospital expenditures occur at the end of life and in the ICU.⁵ Evidence also suggests that early identification of goals of care and advanced care planning may reduce the intensity of unwanted care at the end of life, by reducing ICU LOS and numbers of potential ICU admissions.⁶

Our facility has used a palliative care team for the inpatient population since 2010. Like many hospitals, however, our existing palliative care team was not being used to its full potential in our ICU, and there were multiple misconceptions regarding palliative care from both the nursing and medical staff.⁷ In addition, there were limited data with regard to the impact of palliative care on the ICU or hospital LOS at the Medical Center. The purpose of this project was to improve the utilization of the palliative care team and to enhance palliative care knowledge and awareness of both the nursing and physician staff in the ICU, thereby improving quality of care for the patients and families. In addition, we studied whether the implementation of palliative care principles and increasing the number of palliative care consultations in the ICU would affect LOS for both the hospital and ICU.

METHODS

Setting

A quality-improvement program was conducted in the 15-bed adult ICU at Kaiser Permanente (KP) Moanalua Medical Center, which is a 318-bed tertiary care hospital in Honolulu, HI. This unit is a closed ICU, run by a team of board-certified intensivists following The Leapfrog Group recommendations.⁸ The ICU is a mixed unit that admits patients with medical, surgical, cardiac, and/or neurologic instability, who have the need for close monitoring. The ICU admits approximately 850 patients per year, has an average LOS of 4 to 5 days, and has an average mortality rate of 12%.⁹

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Patient Sample

The target population was all patients admitted to or transferred into the adult ICU. The accessible sample included patients who met daily screening/trigger criteria for a potential palliative care consultation. Although this was an adult ICU, there were times in which pediatric patients (younger than 18 years old) were admitted to the unit. These patients were not included in the sample because of their age.

Most patients were admitted with a variety of general medical ICU conditions, including cardiac and neurologic issues. The surgical patients were represented by all the surgical subspecialties, with the exception of

open-heart surgical patients in the immediate postoperative period. Several patients were necessarily readmitted for treatment to the ICU in the same month. When this occurred, for the purposes of this study, they were counted only once, and their resultant ICU days were totaled together.

Procedures

To identify patients who might best benefit from a more timely palliative care consultation, a project team consisting of palliative care physicians, ICU nurses, and ICU physicians developed procedures that followed the suggestions from the *Improving Palliative Care in the ICU* recommendations

by the Center to Advance Palliative Care.¹⁰ The center’s clinical practice guidelines resulted from standards adopted by the National Quality Forum in its Framework and Preferred Practices for Palliative and Hospice Care, and the National Consensus Project for Quality Palliative Care.¹¹⁻¹⁷ These recommendations included information on the types of inpatient palliative care models, screening and trigger criteria, guidelines and standards, and methods for the evaluation of a program.

Using a literature review and ICU clinical expertise to identify those with a high risk of dying, we created final trigger criteria that were believed to represent the majority of high-risk patients admitted to the ICU. The trigger criteria were:

1. advanced cancer
2. chronic and severe cognitive dysfunction
3. consistency with or lack of goals of care
4. conflict with goals of care
5. multiorgan system failure
6. LOS in ICU longer than seven days.

The general model was, for the most part, a consultative one, using the existing palliative care team. This team included a board-certified physician, registered nurse, chaplain, and social worker. After patients met at least one of the trigger criteria, the nursing staff was taught to direct patients and families to informational videos on goals of care that exist on the KP Education on Demand Webinar.¹⁸⁻²⁰ The intent of the videos was to initiate a conversation regarding goals of care and designation of a surrogate, advance directives, and code status. This led to a social worker consultation for finalization of surrogate designation and advance directives, and then to the ICU physician for code status or resuscitation preferences between Days 1 and 3. The range of days was necessary because of the lack of a designated social worker on the weekends and nights. An ICU family meeting was proactively initiated by Day 3 for those patients meeting the trigger criteria, and if further need was identified, a palliative care family meeting with the multidisciplinary palliative care team was proactively initiated by Day 5. This process is demonstrated in Figure 1.

Once the guidelines and flowcharts were formed, an application to the KP institutional review board was submitted for approval, to ensure completeness of

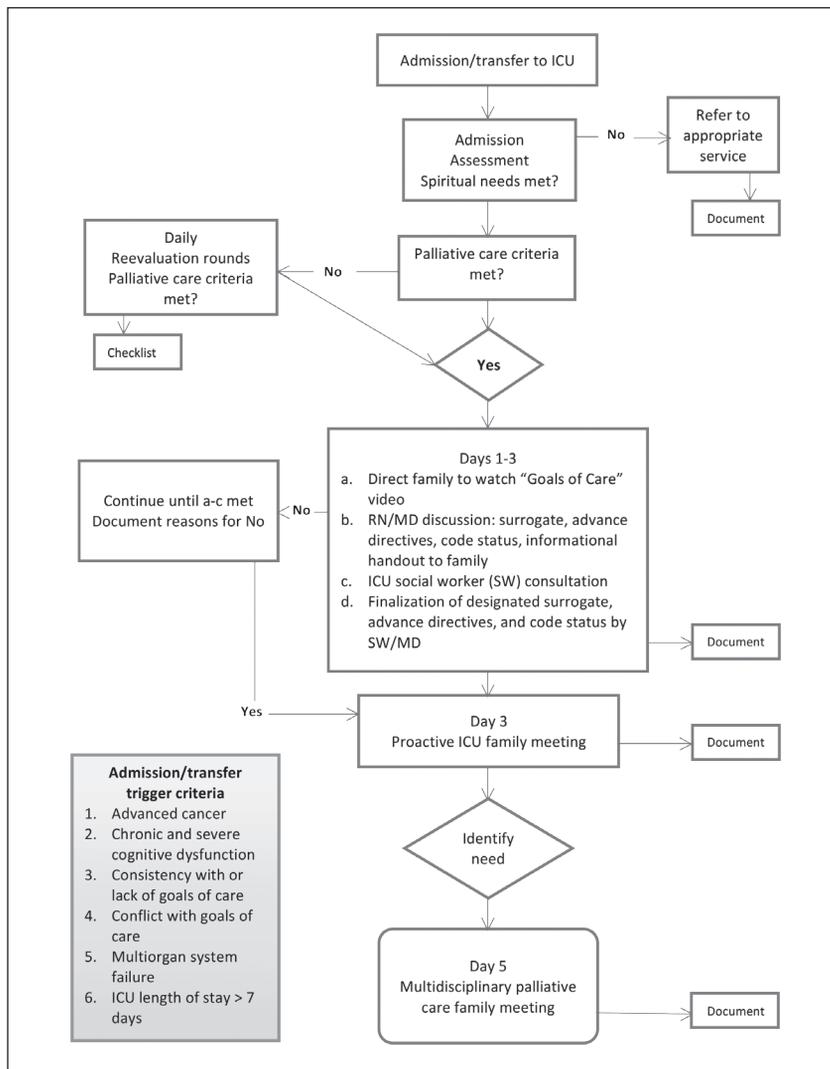


Figure 1. Final workflow, which incorporated guidelines from *Improving Palliative Care in the Intensive Care Unit*¹⁰ recommendations.

ICU = intensive care unit; MD = physician; RN = registered nurse.

the process in implementing this project. Because the implementation of this program would only provide for more timely intervention, without a change of routine practice, and because the study involved only collection of retrospective data without compromising patient confidentiality, the requirement for informed consent was waived by the institutional review board. It was also necessary to notify the KP Quality-Improvement Committee of pending plans, and approval to proceed with implementation was received.

Preintervention patient data were obtained by chart review for a 3-month period from November 1, 2013, through January 30, 2014, for a total of 194 patients. The project commenced on April 1, 2014, and the postintervention data were collected from April 1, 2014, through June 30, 2014. This dataset consisted of 198 patients.

Outcome Measures

The metrics and benchmarks were predetermined and approved by the Quality-Improvement Committee before the implementation of the project. Financial metrics involved the LOS in the ICU and the hospital. Process and outcome measures looked at the early identification of multiple aspects of palliative care practice. These included 1) numbers of patients who met the trigger criteria; 2) goals of care, advance directives, surrogate, code status, and numbers of ICU family meetings by Day 3 of meeting the trigger criteria; 3) use of the "Goals-of-Care" video; 4) numbers of palliative care brochures offered to families; and 5) numbers of palliative care consults.

The pre- and postintervention samples of data were designed to measure the process progression over time. This progression was reported as an aggregate dataset with the intent to show trends before and after intervention.

Data Analysis

This project was an analysis of quality-improvement data. Therefore, experimental design and randomization were not used. Frequencies, means, and standard deviations were used to examine the distribution of measures. An independent *t*-test was used to compare mean scores of the samples that comprised different groups.

Terminology, as defined by Field,²¹ was used for the reporting of the *t*-test results. The following equation was used²¹:

$$t(df) = (t \text{ value}), (p \text{ value}), (r \text{ value})$$

where *df* = degrees of freedom, *t* value = *t*-test result, *p* value = probability, and *r* value = effect size. A Pearson χ^2 test was used for comparisons of various frequencies. The χ^2 results were reported as the value of the test statistic with its associated degrees of freedom and the significant value. The test statistic is denoted by χ^2 .²¹ All descriptive statistics were calculated using Microsoft Excel 2013 (Microsoft Corp, Redmond, WA) along with the Statistical Package for the Social Sciences (IBM SPSS, Armonk, NY). The independent *t*-tests and χ^2 tests were calculated using Excel 2013.

RESULTS

The patients' demographics are presented in Table 1. Results of the outcome measures are reported in Table 2. The outcome measures were reported as a total numeric

value for the three months, with the exception of the LOS in both the ICU and hospital, which were computed as means.

The numbers of individuals and the numbers of patients who met the trigger criteria in both samples were approximately the same. With use of an independent *t*-test, there was a slight decrease in the mean length of ICU days from the preintervention sample (mean = 5.76, standard error [SE] = 0.97) to the postintervention sample (mean = 4.92, SE = 0.50), both of which included decedents. However, this difference was not significant: $t(289) = 0.78, p > 0.05$. There was also a decrease in the mean length of hospital days from the preintervention sample (mean = 17.43, SE = 1.99) to the postintervention sample (mean = 12.88, SE = 1.26). This difference was significant at $t(327) = 1.93, p = 0.05$, but it represented a small effect size ($r = 0.11$).

Despite similar numbers of patients between the 2 populations that met the trigger criteria, the numbers of patients in

Table 1. Description of patient sample in Intensive Care Unit palliative care integration study

Measure	Preintervention (n = 194)	Postintervention (n = 198)
Age group, years		
19-30	7	2
31-40	7	7
41-50	17	22
51-60	42	34
61-70	46	57
71-80	39	50
81-90	29	19
> 91	7	7
Sex, no. (%)		
Men	107 (55.2)	120 (60.6)
Women	87 (44.8)	78 (39.4)
Race/ethnicity, no. (%)		
Asian	72 (37.1)	78 (39.4)
White	71 (36.6)	62 (31.3)
Pacific Islander	46 (23.7)	51 (25.8)
Other	5 (2.6)	7 (3.5)
Admitting diagnosis, no. (%)		
Myocardial infarction	19 (9.8)	28 (14.1)
Cerebrovascular accident	16 (8.2)	20 (10.1)
Sepsis	19 (9.8)	20 (10.1)
Respiratory failure	17 (8.8)	14 (7.1)
Surgery	50 (25.8)	53 (26.8)
Other	73 (37.6)	63 (31.8)
Comorbidities, mean no.	4.47	4.0

Measure	Preintervention (n = 194)	Postintervention (n = 198)	p value
Mean length of stay, days			
ICU	5.76	4.92	0.44
Hospital	17.42	12.88	0.05
Mean APACHE III score	56.54	57.08	0.86
No. of patients who met trigger criteria	41	47	
Outcome measure identified by Day 3, no. of patients of meeting trigger criteria ^a			
Goals of care	10	33	0.01
Advance directives	39	43	0.90
Surrogate	23	20	0.46
Code status	16	37	0.05
Video viewed	2	2	0.90
Receipt of palliative care brochure	0	10	0.005
Family meeting	12	37	0.01
Total no. of palliative care consultations	8	14	0.39

^a The 6 trigger criteria are defined in the text and in Figure 1.

APACHE = Acute Physiology and Chronic Health Evaluation; ICU = intensive care unit.

which the goals of care were identified by Day 3 increased significantly: $\chi^2(1) = 6.62$, $p = 0.01$. Patients in which advance directives were identified by Day 3 of meeting the trigger criteria decreased slightly from 95% to 91%. Those in which a surrogate was identified by Day 3 of meeting the trigger also decreased from 56% to 43%. Neither difference was significant. The numbers of patients who had their code status identified by Day 3 of meeting the trigger criteria increased significantly: $\chi^2(1) = 3.70$, $p = 0.05$. The use of the video remained unchanged, but the use of the palliative care brochure increased from 0% to 21%, reaching significance: $\chi^2(1) = 8.01$, $p < 0.01$. There was a significant increase in the numbers of proactive ICU family meetings by Day 3, from 29% in the preintervention sample, to 79% in the postintervention sample $\chi^2(1) = 6.48$, $p = 0.01$. In addition, there was an increased trend in the numbers of palliative care meetings, which rose slightly, from 20% in the preintervention sample to 30% in the postintervention sample.

DISCUSSION

Limitations

This quality-improvement project had several limitations. The results from this project encompassed a single facility, and it is entirely possible that the resultant trends were an isolated finding. In addition, the

data sample size from both the pre- and postintervention periods were limited to 3 months only. As a result, the timing of the data collected, along with the duration of the collection, may have precluded a true representation of the population. The KP Hawaii (KPHI) membership represents less than 20% of the state's population,²² with approximately 5% of the state inhabitants that remain uninsured.²³ Therefore, it is also feasible that the patient population that makes up the KPHI membership does not accurately represent the total number of inhabitants in the state.

The measures used for this study mostly relied on medical record abstraction from an electronic medical record. Studies have shown that chart abstraction underestimates quality of care by at most 10%, compared with direct observation, and may even overestimate quality in some instances. Because data are lacking on performance of medical record abstraction in palliative care, poor documentation may limit the utility of some of these candidate measures.²⁴ In an effort to reinforce the charting of pertinent outcome measures, a template devised for easy insertion into the electronic progress notes was designed with key phrases. Despite this, it was noted during chart reviews that documentation was inconsistent. These inconsistencies were apparent, with not only the nursing staff but also the physician staff, and it was

sometimes difficult to find specific information. The chart reviews and data collection were performed by the team leader, which resulted in a large time allotment because every progress note was reviewed to search for appropriate documentation. This review did, however, allow for overall consistency in the data collection.

Most of the process and outcome measures were reported as changes in trends. Those measures that were reported as a mean score, however, had an independent *t* test applied. A χ^2 test also was used for the outcomes reported as frequencies, but because this program was a quality-improvement project without experimental design and randomization, the robustness of the inferential statistical results was uncertain.

Potential Cost Savings

The literature shows that most health care expenditures occur at the end of life and in the ICU. Among the nearly 2.5 million annual deaths in the US, one-third occurs in the hospital, and a substantial percentage occurs in the ICU. The ICU can account for up to 80% of the total inpatient costs spent on terminal hospitalizations.^{5,25} Approximately 20% of people who die in the US are admitted to an ICU within the last 6 months of life. In addition, patients with life-threatening diseases frequently receive medical care that conflicts with their end-of-life preferences.²⁶ A reduction in unwanted treatments in the ICU can have an impact on ICU LOS, and interventions that clarify patient's goals of care and whether ICU care is consistent with these goals may reduce the intensity of end-of-life care.²⁷

The results from this project saw a decrease in ICU LOS, but the difference between pre- and postintervention samples was not significant. This may, in part, be because of the sample size. There was, however, a significant difference in the hospital LOS between the pre- and postintervention samples, but with a small effect size. Consequently, a larger sample size might have provided greater evidence of effect. It is uncertain how much of an impact this reduction in ICU LOS or hospital LOS would have had on total hospital costs, but the potential for cost savings from the implementation of palliative care in the ICU is a tempting conclusion. In 2006,

a retrospective observational cost analysis by Penrod et al²⁸ found that palliative care was associated with a significantly lower likelihood of ICU use and lower inpatient costs compared with those of patients who received the usual care. Since then, numerous benefits from the provision of palliative care in the ICU have been demonstrated. Patients who receive advance care planning or palliative care interventions consistently showed trends toward decreased ICU admission and reduced ICU LOS.^{6,29} Starks et al³⁰ suggested that savings could be achieved by earlier involvement of palliative care, and they supported screening efforts to identify patients who could benefit from palliative care services early in admission.

Any number of factors has the potential for affecting not only quality of care but also LOS. There is a general agreement that early identification of the various aspects of goals of care, including code status and the availability of advance directives, influence ultimate care decisions. All these factors have an effect on reducing ICU admission, LOS, and the intensity of treatment of patients who die in the ICU.⁶

This project showed an increase in the percentage of the early identification of goals of care from 24% to 70%, and code status from 39% to 79%, which demonstrated that the effects of the process were positive and significant. The nursing staff also used the palliative care brochure in increased numbers. As demonstrated by Scheunemann et al,³¹ printed information can improve family comprehension and emotional outcomes, and there is supporting evidence for the offering of this printed information by the ICU team to improve end-of-life care and family satisfaction.

The use of the videos was, unfortunately, neglected. These informational videos are evidence-based, culturally appropriate communication tools that were designed as an instrument for physicians to use in their discussions of medical conditions and advance care planning.¹⁸⁻²⁰

These videos exist on the KP Education on Demand Webinar. The intent of this project was to use the videos to initiate a conversation regarding goals of care and designation of a surrogate, advance directives, and code status. Traditionally, it falls to the physician to inform families

about a pending palliative consultation. Once the family is aware of the need for a consultation, the registered nurse supplements the information and any questions with printed material. This project was designed so that the nurse, and not the physician, was to offer the video. The lack of results in this area could underscore the continued staff discomfort with the initiation of sensitive discussions regarding advance directives, code status, and end-of-life issues.

Changing a culture in the ICU affords multiple challenges, but this project demonstrated that early identification of key palliative care interventions, which included a proactive ICU and palliative care meeting, were possible once processes were in place to ensure prompt documentation of code status, advance directives, and goals of care. Celso and Meenrajan³² found that the relationships between days until a family conference, do-not-resuscitate order, number of invasive procedures, and ICU LOS were significant. In addition, the days until the do-not-resuscitate order was found to be a significant predictor variable for total hospital LOS.

CONCLUSION

As the numbers of ICU treatments during the last months of life increase, LOS in both the ICU and in the hospital will continue to be addressed.³³ Inappropriate aggressive treatments in the ICU at the end of life have the potential to result in futile care and an excessive use of hospital resources. In addition, the potential for symptoms from psycho-emotional trauma on family members after an ICU death has proved to be substantial.²⁷ In an effort to reduce expenditures for end-of-life care in the ICU, it is possible that early clarification of advance directives, code status, and goals of care can ensure that palliative care needs are met, leading to improved quality of care for both patients and families, while reducing cost. ❖

Disclosure Statement

The author(s) have no conflicts of interest to disclose.

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The Negative Decisions

There are times when compassion should prompt us to forgo prolonged and costly treatment. If a man must die, he has the right to die in peace, as he would prefer to do if asked. ... But the negative decisions that ease and shorten suffering have always been ours to make.

— Wilder Penfield, 1891-1976, pioneering Canadian neurosurgeon