Improving Processes of Hospital Care During the Last Hours of Life

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**Background:** Known for excellence in care in the last days and hours of life, hospice programs can help individuals have a “good death” and lead to higher family satisfaction with quality of care. Our objective was to evaluate the effectiveness of a multicomponent palliative care intervention based on the best practices of home hospice and designed to improve the quality of care provided for patients dying in an acute care inpatient setting.

**Methods:** This study was a before-after intervention trial conducted between 2001 and 2003. Participants included physician, nursing, and ancillary staff on inpatient services of an urban, tertiary care Veterans Affairs medical center. The palliative care intervention included staff education and support to identify patients who were actively dying and implement care plans guided by a comfort care order set template for the last days or hours of life. Data abstracted from computerized medical records of 203 veterans who died during a 6-month period before (n = 108) and after (n = 95) intervention were used to determine the impact of intervention on symptom documentation and 5 process of care indicators.

**Results:** There was a significant increase in the mean (SD) number of symptoms documented from 1.7 (2.1) to 4.4 (2.7) (P < .001), and the number of care plans increased from 0.4 (0.9) to 2.7 (2.3) (P < .001). Opioid medication availability increased from 57.1% to 83.2% (P < .001), and do-not-resuscitate orders increased from 61.9% to 85.1% (P < .001). There were nonsignificant changes in the proportion of deaths that occurred in intensive care units (P = .17) and in the use of nasogastric tubes (P = .40), and there was a significant increase in the use of restraints (P < .001).

**Conclusion:** Our results indicate that end-of-life care improved after the introduction of the palliative care program.

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**IT IS WELL DOCUMENTED THAT PATIENTS AT LIFE’S END HAVE UNRELIEVED PHYSICAL SUFFERING, AS WELL AS SIGNIFICANT EMOTIONAL, SPIRITUAL, AND SOCIAL DISTRESS.**

Patients who are near the end of life are frequently not recognized.\(^{1,7}\) As a result, their suffering may not be properly appreciated or managed and may even be exacerbated by standard medical care, in which aggressive, futile, or even iatrogenically harmful treatments are often continued.\(^{2,3,9}\)

The modern hospice movement developed partly in response to these difficult and painful situations.\(^{10}\) A traditional, home-based, holistic approach to end-of-life care, hospice care focuses on the management of pain and nonpain symptoms while addressing other forms of distress such as psychosocial stressors and existential angst. Known for excellence in care in the last days and hours of life, hospice programs can help individuals have a “good death”\(^{11,12}\) and lead to higher family satisfaction with the quality of care.\(^{13}\)

Despite the benefits of hospice care, it is likely that most patients die in settings where they do not receive care designed to address their suffering in the last days of life.\(^{14-16}\) Even among hospice patients, statistics indicate that 10% to more than 30% die in a hospital.\(^{17,18}\) These findings underscore the need to address the processes of care for the actively dying patient in the inpatient setting.

The goal of this study was to implement the best practices of hospice care in the inpatient setting where most end-of-life care actually takes place. This can be challenging because in the acute care setting, where the focus is on “cure,” transition away from disease-modifying treatments to a symptom-managing palliative care model can seem counterintuitive. A
previous study used specially trained nurses to improve end-of-life care for seriously ill hospitalized patients but was unsuccessful and suggested that such programs may need physician leaders to implement the program. The purpose of the present study was to evaluate a physician-led Inpatient Comfort Care Program (ICCP) to improve the quality of end-of-life care provided in a Veterans Affairs (VA) medical center.

METHODS

SAMPLES AND SETTINGS

The sample for this study consisted of the staff and patients at the Birmingham VA Medical Center (Birmingham, Ala), a 135-bed urban medical center with a tertiary medical and surgical inpatient service. Prior to this intervention, no organized program existed to care for patients at the end of life. In 2001, a broad-based Palliative Medicine Program was established to improve the quality of end-of-life care for patients in all settings served by the VA medical center. Services include inpatient and outpatient consultation, physician/nurse case management of inpatients, and referral to community-based (home) hospice. Under the broad umbrella of the Palliative Medicine Program, the ICCP was established to improve the care of patients who would most likely die in the inpatient setting. The ICCP included 3 primary components: staff education, case identification, and implementation of a comfort care order set. This study assessed the impact of the ICCP on care provided to the subgroup of patients who died in the acute care inpatient settings of the hospital. The study was approved by the VA institutional review board.

DESIGN AND MEASURES

The study was a before-after intervention trial, designed to evaluate the impact of the ICCP on the processes of care provided at the end of life. Patient cases were identified after death, and outcomes were evaluated from the institutional perspective. Data on inpatient deaths that occurred during the 6 months prior to initiation of the ICCP in 2001 (January 1–June 30, 2001) were compared with data from deaths that occurred after the ICCP was fully established (January 1–June 30, 2003). Data were derived from the Computerized Patient Record System medical records of veterans who died as inpatients during these periods. Records were reviewed using a structured chart abstraction tool designed to quantify the processes of care at the end of life. The chart reviews included information from the last 7 days of life and focused on the processes of care in place at the time of death.

The primary process of care outcome identified was (1) presence of an order for opioid medication at the time of death, (2) presence of a do-not-resuscitate order in place at the time of death, (3) location of death (intensive care unit vs other), (4) presence of a nasogastric tube at the time of death, and (5) whether the patient was in restraints at or near the time of death. The hypothesis was that each of these 5 measures would show significant change after implementation of the ICCP. Other process of care variables were resuscitation attempt at time of death, whether hospice care was offered, palliative care consultation, presence of family at the time of death, and documentation of pastoral care services.

As an indication of whether staff were attending to symptoms that are common at the end of life, data were also obtained on whether documentation existed for 13 such symptoms (ie, pain, dyspnea, cough/secretions, asthenia, anorexia, nausea/vomiting, constipation, skin integrity, continence, delirium/agitation, depression, anxiety, insomnia) and whether a care plan had been documented.

THE INPATIENT COMFORT CARE PROGRAM

The ICCP included 3 primary components: staff education, case identification, and implementation of a Comfort Care Order Set.

Staff Education

Hospital staff education was provided through the American Medical Association's Education for Physicians on End-Of-Life Care (EPEC) training course and teaching rounds conducted by the first author (F.A.B.). Physicians, nurses, and other staff received comprehensive training in how to identify patients who were at the end of life and in how to implement a number of care plans appropriate for this population. So that staff on all shifts and floors of the acute care units could receive training, the training program was conducted in 1-hour sessions at noon or 3:00 PM, in 3 cycles of 16 weeks each. Staff also received training to improve communication skills to help elicit patient and family preferences for care. Because of the monthly turnover in physician staff (interns and residents), physician education was continuous. After the initial training course, ongoing education was more informal with case-based teaching around the care of actual patients who were dying in the hospital.

Case Identification

A major focus of the education initiative was on developing skills to identify patients who were entering the dying process. Indicators of patients at high risk of entering the actively dying phase of their illness are listed below.19-21

- Pre-existing do-not-resuscitate order
- Length of stay exceeding 7 days
- Bed confinement
- Semicomatose state
- Minimal fluid intake
- Inability to take oral medications
- Decline in function with no identifiable reversible precipitant
- Optimum disease modifying therapy already received
- Declining renal function
- Failure to improve within 2 to 3 days of admission
- Diagnosis of cancer (hospital admission is a poor prognostic sign because most cancer treatment is now provided in the outpatient setting).

To promote case identification, a tool was designed to remind and assist staff to identify patients who were near the end of life. “Consider Palliative Care” included a list of simple screening criteria and was developed into a laminated pocket card that was widely distributed to physicians and other staff. The tool was adapted from guidelines published by the National Hospice Organization.21 It has been adopted by VA medical centers in the Southeast as a screening tool for end-of-life care finding and is now published as a pocket card.22 When appropriate, patients were referred to community-based home hospice or residential care.

On a regular basis, a member of the palliative care team asked residents whether they had patients appropriate for comfort care, but cases were not identified for them. The team was available for consultation, but health care providers were not required to request consults.
Comfort Care Order Set

A set of comfort care plans was developed based on the best practices for care in the last days or hours of life as practiced in the home hospice setting and modified for use in the acute care inpatient setting.11,23-27 Interventions included management of pain and nonpain symptoms (dyspnea, anorexia, asthenia, nausea, depression, delirium, anxiety, and seizures); elimination of instrumentation (restraints, feeding tubes, intravenous lines, and other instrumentation); psychosocial interventions (social work notified and family present); pastoral support for patients and family; environmental modifications; skin, mouth, and eye care; diet modifications; changing location of care; discontinuing unnecessary medications; management of secretions and rattling respirations; and referrals to hospice.

To ensure consistency, all of these symptom management techniques and processes of care were developed into a formal comfort care order set, which included both a nursing order set and a physician order set. The order sets could be customized for individual patients, with all or some of the orders selected as appropriate and integrated into the existing care plan. To overcome the barrier of physician reluctance to abandon disease-modifying therapies, implementation of the comfort care order set did not necessarily mean that other treatments had to be discontinued. In this way the successful symptom management and each research hypothesis was formulated as a 2-sided hypothesis. Owing to the before-after design of this study nested within 1 hospital, deaths in the different intervention periods cannot be considered statistically independent. Because almost all statistical tests including chi² test of proportions assume independence, the nonindependence between observations and the two 6-month periods preclude the use of common statistical methods.

To overcome this issue, randomization tests were used to test the research hypotheses.28 Specifically, the statistic of interest, typically difference of proportions in the two 6-month periods, was first calculated. Then, through a process of 1000 simulations, the distribution of this statistic was estimated assuming that the null hypothesis was true. Assuming that the null hypothesis is true implies that there is no association between outcome and time period that allows the permutation or shuffling of observations between the two 6-month periods. Keeping the number of observations in each period constant, the data were randomly permuted 1000 times, and the observed value of the statistic of interest was recorded for each permutation. After the 1000 permutations, the true observed test statistic was compared against the simulated null distribution of the randomly permuted observations, and a P value was estimated by counting the number of simulations that produced a statistic more extreme than the one observed in our data. Because we have only 1 hospital and concern of confounding exists, we built more complex models adjusting for covariates and evaluated those models by randomization tests as well.

For the 5 primary outcomes of processes of care, a Bonferroni correction for multiple comparisons was used. Therefore, to ensure an experiment-wise error rate of P<.05, the comparison was not declared statistically significant unless an estimated P value of less than .01 was observed. Corrections for multiple comparisons were not used for the secondary process of care outcomes. All analyses were conducted using SAS 9.0 (SAS Institute, Cary, NC) statistical software.

RESULTS

A total of 203 veterans who died in the hospital were identified (199 men and 4 women). Patients ranged in age from 37 to 93 years (mean, 68 years). Average length of stay was 11.2 days (range, 1-141 days). Characteristics of patients are presented in Table 1. The preintervention and postintervention groups were not significantly different on any of these variables.1

There were 108 deaths in the 2001 sample and 95 deaths in the 2003 sample. Despite a large increase in the number of veterans seen (from 36 885 in FY2000 to 43 339 in FY2003), this represents a 12.0% decrease in inpatient deaths. Of the 95 postintervention deaths, 8 (8.4%) were deemed truly sudden and unexpected (eg, death in the perioperative period).

DATA ANALYSIS

Prior to data abstraction, a priori hypotheses were formulated for each of the process of care variables under investigation, and each research hypothesis was formulated as a 2-sided hypothesis. To ensure consistency, all of these symptom management techniques and processes of care were developed into a formal comfort care order set, which included both a nursing order set and a physician order set. The order sets could be customized for individual patients, with all or some of the orders selected as appropriate and integrated into the existing care plan. To overcome the barrier of physician reluctance to abandon disease-modifying therapies, implementation of the comfort care order set did not necessarily mean that other treatments had to be discontinued. In this way the successful symptom management and each research hypothesis was formulated as a 2-sided hypothesis. Owing to the before-after design of this study nested within 1 hospital, deaths in the different intervention periods cannot be considered statistically independent. Because almost all statistical tests including chi² test of proportions assume independence, the nonindependence between observations and the two 6-month periods preclude the use of common statistical methods.

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Health care providers increased documentation for 12 of the 13 end-of-life symptoms (P = .01) and increased care plans for 12 of 13 symptoms (P = .046). Although the palliative care consult team wrote notes contributing to these changes, the majority of the documentation was done by nonpalliative care providers, indicating an increase in symptom documentation and care plans by the broader team of providers.

**PROCESS OF CARE OUTCOMES**

The availability of opioid pain medication at the time of death, as documented in the patients’ records, increased significantly from 57.1% to 83.2% (P < .001). Similarly, do-not-resuscitate orders increased from 61.9% to 85.1% (P < .001). Accompanying this was a significant decrease, from 34.4% to 15.4%, in the proportion of patients who had a resuscitation attempt at the time of death (P = .002). The percentage of deaths that occurred in intensive care settings declined from 42.6% to 32.6% but was not statistically significant (P = .17). There was also a nonsignificant reduction in the use of nasogastric tubes (27.8% to 21.3%; P = .40). There was an unexpected increase in the documented use of restraints from 6.0% to 22.6% (P < .001).

In addition to these primary outcomes, there was a nonsignificant increase, from 46.4% to 57.8%, in the proportion of patients who had a family member present at the time of death (P = .09). The proportion of patients who had a note for pastoral care services did not change significantly (53.5% to 42.4%; P = .17). However, a concurrent reduction in the number of pastoral staff may preclude a valid assessment of this variable. Hospice care offerings increased from 25% to 31.5% as anticipated, although the increase was not statistically significant (P = .26). However, this analysis did not include patients who accepted referrals to hospice and subsequently died outside the hospital.

Because we had only 1 hospital and concern of confounding exists, we built more complex models adjusting for covariates. A careful review of all the observed covariates (including race, cancer, heart disease, other demographic variables, and other medical conditions) indicated that the largest changes between the two 6-month periods were a decrease in proportion of African Americans, an increase in the number of cancer deaths, and a decrease in heart disease deaths within the hospital. Regression models, adjusting for these factors, were constructed for all outcomes and randomization tests were conducted for these models. Adjustment for these covariates did not alter the significance of the intervention effect for any of the outcomes.

The results of this study show changes in processes of care at life's end following implementation of the ICCP. Increased documentation of symptoms indicates that the intervention was successful in stimulating staff to recognize symptoms and better identify patients who are dying. Changes in processes of care indicate that staff responded to symptoms by ordering care plans appropriate at the end of life, including making pain medication more available and increasing do-not-resuscitate orders.

The primary process of care, presence of an order for opioid medication at the time of death showed a highly significant change from 57.1% to 83.2%. If the 8 truly sudden, unexpected deaths are eliminated, this figure rises to 90.8%. This change is important because pain and dyspnea are perhaps the most distressing symptoms experienced by dying patients, and opioids are the most reliable and effective medications for control of these symptoms at life’s end.

The second process of care, presence of a do-not-resuscitate order at the time of death, increased from 61.9% to 85.1%, indicating that most of the dying patients were recognized and their preferences for end-of-life care documented. This was accompanied by few efforts to resuscitate, indicating that the orders were honored in most cases. Most patients who did not have a do-not-resuscitate order sustained unexpected sudden death. The do-not-resuscitate order is an important clinical process that reflects a level of physician-patient and physician-

Table 2. Documentation of Symptoms and Care Plans

<table>
<thead>
<tr>
<th>Symptom</th>
<th>Preintervention Documented</th>
<th>Postintervention Documented</th>
<th>Preintervention Plan Documented</th>
<th>Postintervention Plan Documented</th>
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<td>5.6</td>
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<td>0.0</td>
<td>38.9</td>
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<td>49.5</td>
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<td>18.9</td>
<td>2.8</td>
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</table>
family communication needed to understand and honor preferences and to exchange information about prognosis and interventions. These discussions are also significant because they represent a potential turning point in the trajectory of care away from a strictly disease-modifying, curative path to a more symptom-focused palliative care path.

Another goal of the intervention was to transfer patients from intensive care settings to medical units, to reduce the use of uncomfortable or painful interventions and optimize the family’s ability to spend time with the patient. Deaths in intensive care settings declined from 42.6% to 32.6%; however, this was not statistically significant. The impact of the ICCP on location of death may have been attenuated by efforts of the overall Palliative Care Program to offer patients referral to hospice care at home. As more patients accepted referral to home-based hospice, the sample of patients dying in the hospital may have become enriched with those who were more critically ill and more likely to have illnesses for which aggressive treatment in an intensive care unit was appropriate. Previous research in the VA Health System has demonstrated increased rates of hospice enrollment and decreased overall use of intensive care units after implementing a palliative care program.31

In the present study, the reduction in the use of nasogastric tubes (from 27.8% to 21.3%) proved more modest than expected. Apparently, it was more difficult to remove an existing intervention than to add new interventions such as pain medication. The nasogastric tube, as a form of feeding, is a potent symbol of nurturance, and for this reason, may have met with a certain measure of resistance to change. Similar to altering the location of death, removing nasogastric tubes might also have been affected by more patients choosing home hospice care, leaving this sample enriched with patients for whom aggressive treatments such as nasogastric tubes were appropriate.

Although it was a goal of the intervention to reduce restraints, documented use of restraints increased. This is most likely explained by the concurrent implementation of new safety policies to improve documentation and monitoring of patients in restraints. Nevertheless, only 16.3% of patients were in restraints at time of death, most of whom experienced a sudden death.

This inpatient palliative care intervention involved an integrated 3-pronged approach to changing staff practices. Staff education, case identification, and the comfort care order set are interdependent components, each of which is needed for the others to be optimally effective. Previous research has demonstrated that education alone is inadequate to change behavior.32,33 This intervention went beyond ordinary education to facilitate change in physician and nurse practice patterns by providing tools such as pocket card reminders, supportive policy changes, and a structured order set to reinforce and guide care plans. However, to appropriately choose those care plans, the symptoms must first be recognized and documented. The present study found increases in documentation of symptoms, which presumably paved the way for the corresponding increases in care plans for these symptoms. In turn, having learned the skills to manage symptoms seems to reinforce staff motivation to look for and document those symptoms. As one nurse told us, “Before, I didn’t know what to do to help with these problems. What was the point of writing about symptoms I couldn’t do anything about?”

It is a limitation of this study that the intervention was tested in a single site using a time-series approach without controlling for the potential effects of secular trends. It is therefore possible that the improvements could be due at least in part to factors other than the intervention. However, no other programmatic changes at the hospital were concurrent with the development of the ICCP that could account for the changes documented. While in our medical center, the proportion of deaths occurring in the intensive care unit setting declined by 23.5%, pooled data from 5 other VA medical centers in the region showed that deaths in the intensive care unit actually increased by 31.2%. If we regard these other centers in our region as representative of secular trends, then the data suggest that these trends were actually reversed after the intervention was initiated at our medical center. Future research can overcome this limitation by replicating the intervention in other inpatient settings and using appropriate control groups. Some comprehensive programs have established palliative care consult teams as a mechanism for providing end-of-life care in the inpatient setting.34,35 The Veterans Health Administration recently launched an initiative mandating that all VA medical center facilities have palliative care consult teams.36 Others have explored creating specialized inpatient units and shown that it is possible to carry out hospice care plans in these units.35,36,37,38 Palliative care does not have to increase costs and may actually decrease the costs of caring for patients at the end of life.39,40

The palliative care intervention evaluated in the present study is a unique approach to the care of patients who are dying in the hospital. Results show that even in the absence of a specialized inpatient unit it is possible to alter the culture of the inpatient setting to incorporate palliative care plans appropriate for patients at the end of life. In this model, inpatient palliative care is part of a broader integrated system of care, in which the location of care does not preclude palliative care. Without the inherent limitations of being unit based, palliative care can be delivered regardless of the location in the hospital. Thus, this palliative care program represents an important approach to the paradigm shift in hospital culture that must take place to assure quality care for the patient who is dying in the hospital.

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