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Evaluation of a Multifaceted Educational Intervention to Improve Palliative Care in the Intensive Care Unit

Adopting the Care and Communication Bundle

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Currently, palliative care needs are inconsistently implemented in intensive care units (ICUs). To remedy this problem, a multifaceted educational intervention was delivered to interdisciplinary ICU team members to promote the adoption of the Care and Communication Bundle for patients identified as being at a high risk of death. A preintervention/postintervention evaluation design was used to determine the extent to which the nine quality measures of the Care and Communication Bundle, patient length of stay, and patient mortality were changed after this educational intervention. On the basis of statistical results, documentation of an appropriate decision maker, advance directives, resuscitation status, and social work contact significantly improved after the multifaceted educational intervention to integrate palliative care measures into the ICU.

KEY WORDS

care and communication bundle, ICU, palliative care

Almost six million patients are admitted each year to intensive care units (ICUs) in the United States, and between 10% and 29% of these patients will die there.¹ Although palliative care has been recognized as a national priority in ICU care,^{2,3} nearly 2 decades of evidence suggest that few patients receive adequate pain and symptom management on a consistent basis.⁴⁻⁷ In addition to the human costs of prolonged ICU care, financial costs that involve ICU services are approximately 2.5 times more costly than other types of hospital stays.⁸ Recently, the financial incentives of integrating palliative care services in acute care settings have been highlighted in the literature. Some of these incentives include shorter

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lengths of stay, reduced hospital costs, decreased mortality, and finally, decreased hospital readmission rates.⁹ Given the human and financial benefits of palliative care, it is important to integrate palliative care services into ICU settings.

Acting upon national mandates for improved palliative care, the Center to Advance Palliative Care (CAPC) developed the Improving Palliative Care (IPAL) Project. This online repository houses innovative, evidence-based resources essential to the advancement of palliative care.¹⁰ With a co-sponsorship from the National Institutes of Health, CAPC later launched the IPAL-ICU Project, which showcases evidence-based resources aimed at improving palliative care specifically in the ICU setting.^{3,11} One such resource housed on CAPC's IPAL-ICU Web site is the Care and Communication Bundle. The Care and Communication Bundle was initially implemented by the Voluntary Hospital Association as part of their "Transformation of the ICU" performance improvement initiative¹² and is composed of nine time-based quality measures.

The Care and Communication Bundle requires that, by day 1, documentation of the following are required: identified appropriate decision maker (either a medical power of attorney or a health care surrogate), advance directives (living will or medical orders such as a Do Not Resuscitate [DNR] card or Physician Orders for Scope of Treatment/Physician Orders for Life-Sustaining Treatment form), distribution of information leaflet to patients and/or families, regular pain assessment (pain measured at least every 4 hours), and optimal pain management (percentage of 4-hour intervals in which pain rating is <5 on a numeric pain scale, <2 on the Pain Assessment IN Advanced Dementia Scale, or <2 on the Critical-Care Pain Observation Tool).¹³⁻¹⁸ By day 3, documentation of a social work visit and spiritual support should be offered. Finally, by day 5, documentation of the occurrence of an interdisciplinary family meeting should occur.

These nine quality measures are linked to the domains of quality previously established by the National Consensus Project for Quality Palliative Care¹⁹ and National Quality Forum's Framework and Preferred Practices for Quality



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Palliative and Hospice Care.²⁰ Currently, the Care and Communication Bundle is listed by the National Quality Measures Clearinghouse Web site of the Agency for Healthcare Research and Quality as part of its databank for quality measurement, improvement, and reporting.²¹

AIM

The aim of this quality improvement project was to evaluate the effectiveness of a multifaceted educational intervention to increase the documentation of nine quality measures as defined by the Care and Communication Bundle. Mortality and length of ICU stay were also evaluated to determine whether these patient-centered outcomes were affected by this intervention. Because educating the multitude of professionals who provide care in the ICU can be challenging, a theoretical framework was adopted. Rogers' diffusion of innovation²² was selected as a theoretical guide for the implementation of this multifaceted educational intervention because of its widespread use, success in navigating new innovations, and attention to person-specific readiness for change.

BACKGROUND

Since the release of the groundbreaking SUPPORT study revealing ICU patients' pain and suffering,^{4,5} many other investigators have substantiated this study's concerning results. Patients still report uncontrolled symptoms of tiredness, thirst, anxiety, dyspnea, pain, and feeling scared or confused.²³ After surviving the ICU experience, many also report high levels of sleep disturbance, fatigue, weakness, and pain.²⁴ Depression²⁵ and the onset of posttraumatic stress disorder in both patients and families²⁶⁻²⁸ have also been commonly cited. In addition, families fail to understand the basic information about diagnosis, prognosis, or critical care treatments^{29,30} and are not satisfied with the communication they receive while their family member is in the ICU.³¹

The good news is that effective palliative care interventions in the ICU are coming into light. Proactive interventions of a family meeting have eased some of the burdens of ICU patients and their families. The use of proactive communication strategies increased the likelihood of the occurrence of family meetings within 72 hours,³² was noted to improve communication within the ICU clinical team and between ICU clinicians and families,³³ and was associated with shorter ICU length of stay.^{33,34} In addition, when the family received a brochure on bereavement with a structured, proactive family conference, the families were less likely to have anxiety, depression, and symptoms of posttraumatic stress 90 days after the patients' deaths.³⁵ Yet, in a recent systematic review, results of proactive palliative care in the ICU are mixed. Whereas there were notable decreases in hospital and ICU length of stay, mortality

was inconsistently decreased, and patient/family satisfaction was not affected.³⁶

Specific research evaluating the integration of palliative care into the ICU setting via the Care and Communication Bundle has also showed promise, although inconsistently. One study showed increased documentation of pain and increased optimal pain management despite the other seven measures of the Bundle as having no increase in documentation.³⁷ In another study using trained ICU nurse teams to improve care through multifaceted interventions of auditing, performance feedback, improvement tools, education, and monthly team meetings led to increased documentation of offering social work and spiritual support, identification of the medical decision maker, and occurrence of family meetings.³⁸

METHODS

Study Design

This quality improvement/DNP capstone project used a pre/post design to evaluate the effectiveness of a multifaceted educational intervention to improve the documentation of the nine quality measures of the Care and Communication Bundle in the ICU.

Setting

This performance improvement project took place in a closed, 18-bed medical ICU (MICU) and 12-bed surgical ICU (SICU) at a 521-bed academic medical center in the mid-Atlantic region of the United States. Patient care was managed by MICU intensivists and junior physicians in various levels of training. Medical consultee services were used at the intensivist's discretion, as the patient's treatment warranted.

Inclusion Criteria

Assistance from an informational technologist within the system's decision support department assisted in electronically identifying all adult MICU service patients by location and length of stay for the inclusion periods. Patients identified were either in the physical MICU or SICU and had a length of stay of at least 5 days. The project leader then reviewed the patient charts to determine whether they met other inclusion criteria for being at a high risk of death. These criteria included (1) ICU admission after a current hospital stay of greater than 10 days, (2) age of older than 80 in the presence of two or more life-threatening comorbidities, (3) diagnosis of an active stage IV malignancy, (4) status post cardiac arrest, (5) diagnosis of a poor prognosis after an intracerebral hemorrhage, and (6) an end-stage heart or lung disease. Because multiple prognostic guides are available, nationally recognized prognostic tools were used to further define poor prognoses.³⁹⁻⁴²



Intervention

For a period of 1 month, the multifaceted educational intervention was delivered to members of the ICU team regarding the importance of integrative palliative care and the Care and Communication Bundle. This education included academic detailing at leadership and staff meetings, presence of posters in the ICU and a bedside nursing checklist, and completion of an online learning module. After this month-long, educational drive, a 6-week waiting period was observed before further data collection to allow for diffusion of the innovation into the daily practices of the bedside nurses.

Academic Detailing

Clinical stakeholder input during academic detailing sessions was sought to increase the support for this project. These stakeholders consisted of social workers, chaplains, ICU nurse leaders, bedside ICU nurses, attending ICU physicians, and the supportive care team. The project leader provided face-to-face education and a supporting project briefed to these stakeholders at individual and departmental meetings. During these meetings, efforts were placed on building relationships with the stakeholders and providing evidence-based information regarding how the Care and Communication Bundle aligned with their departmental and overall health system goals, especially Magnet recertification and Joint Commission standards.

Posters

Strategically placed educational posters, developed by the project leader, were developed to provide a constant visual for bedside nurses regarding the importance of documenting the quality measures of the Care and Communication Bundle. The posters included key background information of the importance of palliative care in the ICU and described how the Care and Communication Bundle aligned with departmental and system goals.

Bedside Checklist

A bedside nursing checklist was placed in a folder outside each patient room in the ICU. These folders typically contained referral information for nurses to access for patient care, such as pain assessment tools, wound management strategies, and agitation and sedation scales. Providing the checklist in this bedside folder allowed nurses easy access to refer to the documentation timelines required by the Care and Communication Bundle.

Online Learning Module

An online learning module was also developed and delivered electronically to all ICU nurses through the facility's intranet. The online module was assigned to all nurses in the MICU and SICU for a period of 1 month

and obtained a 100% completion rate ($n = 90$). The module was developed by the project leader and took approximately 45 minutes for completion. Educational objectives of the module included being able to discuss the state of palliative care in the ICU, describe the Care and Communication Bundle, and identify the role of the ICU nurse in promoting palliative care within the ICU.

Sampling Plan

Power analysis was used to calculate the minimum sample size required to determine an effect of the given sample before data collection for this performance improvement project. It was determined that a sample size of 55 was needed both before and after the intervention to obtain a power of 0.80, which is the standard for adequacy.⁴³

A convenience sample of 55 chart audits was used to collect data before and after the intervention. Preintervention data collection included chart audits from a 6-month period before the intervention. Postintervention data collection began 6 weeks after the intervention to allow for diffusion of the intervention into practice and continued until the postintervention sample size of 55 was obtained.

Data Collection and Analysis

Once the project leader made the determination that the patient met the inclusion criteria, frequencies of documentation of the nine quality measures of the Care and Communication Bundle, length of stay, and patient mortality data were collected from the electronic medical record (EMR) using a chart abstraction tool provided by the IPAL-ICU Web site.¹¹ During the initial phases of the postintervention chart review, the realization was made that many high-risk patients with shorter ICU lengths of stay were benefiting from the Care and Communication Bundle. To capture these data, the requirement of an ICU length of stay of 5 or more days was removed from the screening procedures and approved by the institutional review board. Data were analyzed using χ^2 and independent t tests, by an independent statistician, and are reported in the Table.

Data were also collected from the bedside ICU nurses after the completion of the online learning module. After providing information regarding their age, years of nursing experience, years at this facility, ICU experience, nursing experience, highest degree obtained, and specialty certifications, nurses were asked about their learning and their perceptions of palliative care in the ICU.

Ethical Considerations

Permission to conduct the study was given by the institutional review board of the university and the institution where the study was implemented. The study was granted expedited review as all patient data were collected via retrospective chart review and processed

**TABLE Statistical Analysis of Quality Measures and Patient Outcomes**

χ^2 Analysis of Quality Measures/Patient Outcomes					
Quality Measure Patient Outcomes	Result	Preintervention Frequency	Postintervention Frequency	χ^2	Sig.
Advance directives	No	33 (60%)	16 (29.1%)	10.636	.001
	Yes	22 (40%)	39 (70%)		
Appropriate decision maker	No	33 (60%)	16 (29.1%)	10.636	.001
	Yes	22 (40%)	39 (70.9%)		
Resuscitation status	No	0 (0%)	0 (0%)	5.930	.015
	Full code	54 (98.2%)	47 (85.5%)		
	DNR	1 (1.8%)	8 (14.5%)		
Patient leaflet	No	0 (0%)	0 (0%)		
	Yes	0 (0%)	0 (0%)		
Care management visit	No	31 (56.4%)	24 (43.6%)	9.521	.023
	Yes	24 (43.6%)	31 (56.4%)		
Pastoral care visit offered	No	43 (78.2%)	36 (65.5%)	5.845	.119
	Yes	12 (21.8%)	19 (34.5%)		
Mortality	No	29 (52.7%)	38 (69.1%)	3.724	.155
	ICU death	12 (21.8%)	10 (18.2%)		
	On-ICU death	14 (25.5%)	7 (12.7%)		
Independent t Test Analysis of Quality Measures/Patient Outcomes					
Quality Measure Patient Outcomes	Period	Results (N = 55)	SD	t	Sig.
Percentage of who achieved regular pain assessment based on 4-hour intervals	Preintervention	84.3%	14.06466	-0.472	.158
	Postintervention	86.0%	22.48291		
Percentage of who achieved regular optimal pain management based on 4-hour intervals	Preintervention	86.2%	18.09010	2.350	<.01
	Postintervention	74.4%	32.47547		
ICU length of stay, d	Preintervention	10.69	8.322	3.859	<.01
	Postintervention	4.89	7.415		

Abbreviation: ICU, intensive care unit.
Items in bold were found to be significant.

anonymously using a chart abstraction tool.¹¹ Informed consent was provided to the nurses before electronically agreeing to participate. Nurses were informed that their involvement was strictly voluntary and that there would be no repercussions if they chose not to participate.

RESULTS

Quality Measures and Patient Outcomes

The quality measures of the Care and Communication Bundle were evaluated as the percentage of the actual times the



quality measure was documented according to the recommended time frames. Five of the nine measures showed significant differences from the preintervention to postintervention periods and included documentation of an appropriate decision maker ($P < .001$), advance directives ($P < .001$), resuscitation status ($P < .015$), and care management visits ($P = .023$), and optimal pain management was surprisingly, significantly less ($t = 2.350$, $P < .01$) in the postintervention period. Upon closer examination of resuscitation status, DNR preferences were found to be significantly increased ($P = .015$) after the implementation of the Care and Communication Bundle. Measures that were not statistically different after the intervention were the distribution of a supportive care informational leaflet, spiritual care offering ($P = .119$), an interdisciplinary family meeting ($P = .471$), and percentage of regular pain assessment ($t = -0.472$, $P = .158$) (Table). Finally, patient outcome data revealed that ICU length of stay was found to be significantly less ($P < .001$), as expected because of the removal of the 5-day minimum length of stay criterion in the postintervention period. Patient mortality was not significantly affected ($P = .155$) (Table).

Patient Demographics

Patient characteristics were captured using the chart abstraction tool.¹¹ Even with changes to postintervention length of stay criteria, patient characteristics were similar with one exception. There were significantly less patients with an end-stage heart and lung disease ($P = .022$) in the postintervention group ($n = 24$, 43.6%) versus the preintervention group ($n = 36$, 65.5%). Patients also had significantly shorter lengths of stay in the postintervention period (4.69 vs 10.69 days, $P < .01$). Data regarding age and ethnicity were not captured.

Nurse Demographics

Nurse characteristics were collected in a posttest survey after completion of the online learning module. The nurses were predominantly Caucasian women and worked interchangeably in both MICU and SICU. Data from the posttest survey revealed that more than 75% of the nurses were younger than 40 years and had obtained their BSN. Only 25% had more than 10 years of experience and/or a specialty nursing certification. Most nurses (87%) agreed that they had increased their knowledge after completion of the online learning module. Seventy percent of the nurses felt that lack of communication among the health care team and with patients and families was the biggest obstacle to quality palliative care in the ICU. Finally, 80% of the nurses believed that the largest area needed for improvement of palliative care in this setting was communication in general.

DISCUSSION

This quality improvement project evaluated the effectiveness of a multifaceted educational intervention to im-

prove the documentation of palliative care in the ICU, using the Care and Communication Bundle. After the intervention, there were successes consistent with the literature.^{37,38,44} Documentation of an appropriate decision maker, advance directives, resuscitation status (specifically DNR orders) by day 1, and social work visitation by day 3 increased. However, documentation of offering a spiritual care visit by day 3 and an interdisciplinary family meeting by day 5 did not increase, as previously demonstrated.³⁷ Inconsistent with the literature,³⁸ documentation of regular pain assessment and optimal pain management by day 1 also did not occur.

One factor that may have limited this study's success was the short ICU length of stay in the postintervention group. It may be that the ICU team did not have the time needed to maximize pain control, offer spiritual care, or conduct a family meeting by the key time frames dictated by the Care and Communication Bundle. In addition, during the time of the intervention, a new pain tool, the Critical-Care Pain Observation Tool, was being implemented in the ICUs. Consistent with the literature,¹⁶⁻¹⁸ this tool may have allowed nurses to discern pain more effectively from other symptoms, thus leading to the increased documentation of higher pain values. Finally, it was noted that there was no designated area in the EMR to document the Supportive Care leaflet distribution, leading to the inability to assess these data.

Limitations

There were limitations regarding the implementation of this quality improvement project. The data were collected retrospectively via convenience sample of chart audits. Postintervention inclusion criteria accepted patients with shorter lengths of stay than those in the preintervention group. Subsequently, patients were found to be different in the preintervention and postintervention periods, specifically regarding the presence of an end-stage heart and lung disease and length of stay.

Another limitation of this study was that not all patients at a high risk of death were captured by the inclusion criteria. It was noted that, during the chart reviews, other patients with life-limiting diagnoses may not have been included in this study. For example, patients with hematopoietic cancers are not classified as stage IV typically. This diagnosis is often limited to solid tumors. Patients with severe dementia or progressive neurological disease, particularly amyotrophic lateral sclerosis, also were not captured as being at a high risk of death. Finally, morbidly obese patients with hypoventilation syndrome and hypoxic respiratory failure were not included in this study unless they also had an underlying disease process identified by the inclusion criteria. Therefore, it is postulated that a more comprehensive definition of "high risk of death" may lead to improved identification of patients who would benefit most from palliative care.



This study used chart audits to determine whether the nine measures of the Care and Communication Bundle had been documented according to the key time frames. For this study, other measures of data inquiry may have been beneficial, especially when documenting the frequency of the distribution of the supportive care patient leaflet. Nurses' narrative notes tend to document only aberrations from normal and therefore did not address the normal process of distributing the supportive care informational leaflet to patients or families.

Recommendations

Because it is difficult to quickly identify patients at a high risk of death in the ICU, it is recommended that ICU teams examine new, electronic methods for capturing end-stage diagnoses so that they are readily visible in the patient's EMR and adding the surprise question to the delivery of care may aid in this endeavor. The surprise question has been used for patients with various life-limiting illnesses to assist in recognizing patients appropriate for palliative care and has been found to be an important prognostic indicator in identifying patients with less than 1 year to live.^{45,46} Therefore, the surprise question may be useful in identifying more patients at a high risk of death, especially in the ICU. If the physician can say "no" that he/she "would be surprised if the patient died within the next year," then the patient is recognized as having a worse prognosis. Making life-limiting illnesses more recognizable at a glance in the EMR may increase the identification of patients with poor prognoses more readily in the ICU, including those with short ICU lengths of stay. In addition, consideration to adding specific quality measures to the EMR for quick and highly visible documentation would make the quality measures of the Care and Communication Bundle more visible.

CONCLUSIONS

There are national guidelines and sufficient research to support the need for improvement of ICU palliative care for all patients. Yet, the improvement of palliative care within ICUs in the United States remains challenging. To improve the quality of palliative care in the ICU, implementation of the Care and Communication Bundle within this project's framework has added to the evidence base. Documentation of an appropriate decision maker, advance directives, resuscitation status, and social work contact significantly improved after a multifaceted educational intervention to improve the documentation of the nine quality measures of the Care and Communication Bundle in the ICU.

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