

Knowledge of Palliative and End-of-Life Care by Student Registered Nurse Anesthetists

Margaret Faut Callahan, CRNA, PhD, FAAN

Susan Breakwell, RN, DNP, APHN-BC

Rosemarie Suhayda, RN, PhD

As part of a 5-year study funded by the National Cancer Institute, all graduate nursing students, including student registered nurse anesthetists (SRNAs) participated in a 2-credit-hour course called Interdisciplinary Palliative Care. Medical and health science students also participated in the course, with more than 800 students completing the course to date. The sample consisted of 62 master's-level students enrolled in either the first or second year of the nurse anesthesia program. A pretest-posttest design was used to determine changes in palliative care knowledge and per-

ceived effectiveness in palliative care skills. There was an overall improvement in knowledge and attitudes related to course content. Students reported that, through the development of new knowledge, they felt better able to care for and advocate for their patients. Further research is needed into the appropriate roles that Certified Registered Nurse Anesthetists (CRNAs) can play in palliative and end-of-life care.

Keywords: Hospice care, pain, palliative care, symptom management

The Institute of Medicine (IOM), the National Cancer Policy Board (NCPB), National Consensus Project for Quality Palliative Care, and others have identified serious gaps in the provision of palliative or comfort care. Despite tremendous strides in increasing awareness of the need for palliative care and in palliative care education, much work remains.¹⁻⁵ Individuals requiring palliative care frequently receive inadequate or no treatment of physical and psychological symptoms such as pain, dyspnea, anxiety, or depression.^{4,5} Historically, palliative care content has been largely missing from academic curricula for physicians, nurses, and others in healthcare-related fields.⁶⁻¹⁰ Key areas of palliative care education and service delivery that have been identified for improvement include training of healthcare professionals in patient- and family-centered care and goal setting, symptom management, and effective interdisciplinary teamwork.^{6-8,11-13}

Also of importance is the need to differentiate between palliative and hospice care, often misunderstood by healthcare providers. Palliative care is defined as comfort care that can be implemented at any time after a diagnosis of a life-limiting illness is made. As described by the World Health Organization (WHO), it emphasizes a team-based, holistic approach to care of the patient and family through assessment and treatment of physical, psychosocial, or spiritual symptoms and prevention and relief of suffering.¹⁴ End-of-life and hospice care are a part, but not the whole, of palliative care. Palliative care encompasses effective management of pain and other distressing symptoms such as nausea and vomiting, anxiety, and spiritual distress and requires the expertise

of a variety of healthcare providers who are able to communicate, coordinate, and ensure continuity of palliative care.¹² The differences between palliative care and hospice care are depicted in Figure 1.

To date, SRNAs have received little training in palliative and end-of-life care, beyond the realm of management of acute pain and symptoms. A search of the literature discovered no publications addressing the importance of incorporating elements of palliative care into nursing and nurse anesthesia practice.

Although palliative care is not a customary area of practice for CRNAs, the knowledge and skills necessary to provide competent and compassionate palliative and end-of-life care are present in many nurse anesthetists. Today, our students come to nurse anesthesia with many

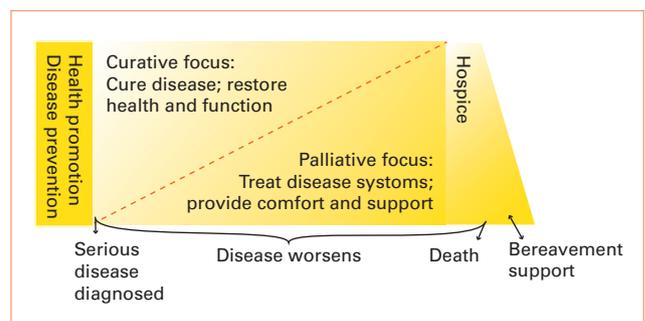


Figure 1. Differences Between Palliative Care and Hospice Care

Balancing approaches to care along the health-illness continuum means incorporating a palliative focus.

Adapted with permission from "Plenary 3: Elements and Models of End-of-Life Care," The EPEC in Palliative and End-of-life Care (EPEC) Curriculum. Chicago, IL: EPEC, 1999, 2003.

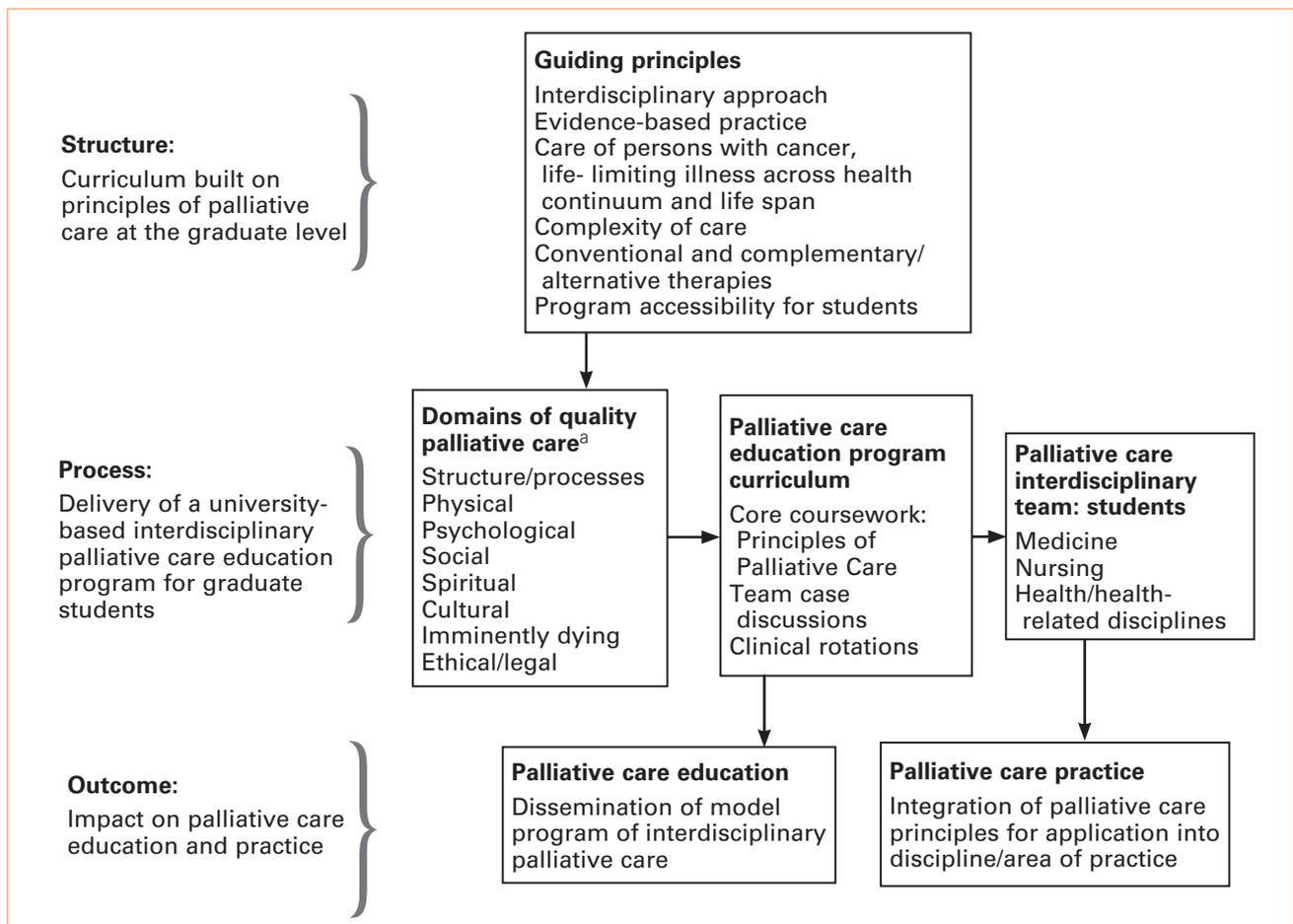


Figure 2. Framework for Interdisciplinary Palliative Care Education Program^a

^a Source: National Consensus Project for Quality Palliative Care. *Clinical Practice Guidelines for Quality Palliative Care*. 2nd ed. Brooklyn, NY; 2009. <http://www.nationalconsensusproject.org/guideline.pdf>. Accessed April 7, 2011.

(Reprinted with permission from Breakwell S. Interdisciplinary Palliative Care Education Framework. In: Faut-Callahan M, Breakwell S. *Developing a University Based Palliative Care Education Program* [unpublished nursing practice doctoral project]. Chicago, IL: Rush University College of Nursing; 2004:36.)

years of experience in acute and critical care nursing. No doubt, they have often been faced with palliative care and end-of-life issues. Additionally, CRNAs have expert skills in pain and symptom management.

As part of a 5-year study funded by the National Institutes of Health, all graduate nursing students, including student registered nurse anesthetists (SRNAs), at a single institution participated in a 2-credit-hour course titled Interdisciplinary Palliative Care. The course also included medical students and other health science students. To date, more than 800 students have completed the course. The project team sought to identify SRNAs' knowledge and attitudes regarding palliative and end-of-life care and to determine potential roles for CRNAs in this growing area of practice.

Methods

- *Program Development and Implementation.* To address the need for palliative care education of stu-

dents in an interdisciplinary way, an Interdisciplinary Palliative Care Education Program was developed. The process began by assembling a task force of stakeholders composed of both faculty and clinicians that included nurse anesthetists, other nurses, anesthesiologists, other physicians, occupational therapists, pharmacists, representatives from religious groups, and representatives of health and human values units. Using published recommendations and competencies from sources including the Institute of Medicine, National Consensus Project, End of Life Nursing Education Consortium, Educating Physicians in End of Life Care (EPEC; now renamed Education in Palliative and End-of-life Care), the task force developed a framework (Figure 2) for an interdisciplinary education program. With support for this education initiative from within the institution's academic and practice areas and with funding from the National Cancer Institute, an interdisciplinary palliative care course (Table 1) was approved by the curriculum

Web-based didactic and discussions course work

Palliative care and the interdisciplinary team
Decision making
Palliative care approach to pain and pain management
Symptoms and symptom management in palliative care
Reflective practice and suffering
Care in the final hours
Life span, ethical, and legal issues threaded throughout modules

Simulation laboratory and case discussions

Case 1: Patient with progressive lung cancer and patient's family at 4 different time points
Case 2: Family decision making about artificial feeding in patient with dementia
Case 3: Patient with late-stage ovarian cancer with young children and spouse at home

Clinical observation experience

Inpatient palliative care services (geriatric and pediatric)
Area hospices and palliative care services

Table 1. Content of Interdisciplinary Palliative Care Course

committees of Rush University College of Nursing and Medical College, Chicago, Illinois.

In 2006 an interdisciplinary palliative care course, required of all graduate nursing specialty programs and elective for all other Rush University students, was launched. The course was accessible to campus-based and distance students. To meet the varying needs of students with different schedules and programs of study, this interdisciplinary course was (and still is) offered twice each academic quarter in compressed blocks of time. It was primarily online with asynchronous discussions, and included a simulation laboratory and clinical observation experiences.

- *Evaluation.* Varied methods of evaluating student and course outcomes have been employed. Students' self-assessed palliative care effectiveness and knowledge were assessed before and after the course, as was self-reflection and feedback about their simulation laboratory experience. Students provided feedback about their impressions and experiences with the course, simulation laboratory, and clinical observation via an online survey after completion of the interdisciplinary palliative care course. Graduates of the course (alumni) were asked to complete a survey to determine how they incorporate palliative care into their area of practice well after completing the course.

- *Sample.* The sample consisted of 62 master's-level students enrolled in either the first or second year of the nurse anesthesia program at Rush University College of Nursing. Of the sample, 30% indicated that they had attended a workshop or in-service on palliative care before taking this course, 15% completed a learning module in palliative care, and 48% completed a course in pain management. Before enrolling in this course, 48% had neither formal nor informal preparation in palliative care.

- *Data Collection.* A pretest-posttest design was used

to determine students' changes in palliative care knowledge and perceived effectiveness in palliative care skills. The Palliative Care Knowledge Examination, developed by Weissman,¹⁵ is a 36-item multiple-choice test that measures knowledge of palliative care in 4 educational domains: pain assessment and management, nonpain symptoms and syndromes, communication and ethics, and terminal care. The test includes 11 case studies for which students are asked to respond to a series of questions.

The pain assessment and management domain is the largest component of the test and consists of 4 case studies that present chronic pain associated with bone metastasis, arthritis, advanced peripheral vascular disease, and sickle cell crisis. Test items focus on the differentiation between various types of pain (neuropathic, somatic, visceral, and vascular), selection of appropriate analgesics, dose conversion between analgesics and routes of administration, and management of adverse effects.

Test items for the additional 3 educational domains are distributed throughout the remainder of the test such that the series of items associated with any one case study might address multiple domains. These remaining case studies focus on end-stage situations resulting from liver and breast cancer, renal disease, and AIDS. Two symptoms of disease progression that are often less understood include drug therapies for anorexia/cachexia and malignant hyperglycemia, common complications of multisystem failure.

The Self-Assessment Survey, adapted from the End of Life Attitudes Survey distributed by the City of Hope Pain/Palliative Care Resource Center,¹⁶ is a 10-item instrument on which students rate their perceived effectiveness in pain and symptom management, communication and interdisciplinary work, cultural issues in palliative care, and overall care in the final hours. They also rate their effectiveness in differentiating between pallia-

| Knowledge domain | Transition probability score (%) | Knowledge domain | Transition probability score (%) |
|---|----------------------------------|---|----------------------------------|
| Pain assessment and management | | Nonpain symptoms and syndromes | |
| Dose conversion: oral to intravenous (IV) morphine | 94 | Drug management of retained oropharyngeal secretions | 86 |
| Identifying somatic pain | 88 | Drug treatment for terminal dyspnea | 83 |
| Management of respiratory depression | 75 | Management for terminal delirium | 80 |
| Dose conversion: IV morphine to IV hydromorphone | 75 | Diagnosis of depression at end of life | 67 |
| Dose conversion: IV morphine to subcutaneous morphine | 70 | Drug treatment for anorexia/cachexia | 50 |
| Pharmacology of oxycodone | 70 | Diagnosis of malignant hypercalcemia | 15 |
| Constipation prophylaxis | 67 | Communication and ethics | |
| Identifying neuropathic pain | 63 | Informed consent | 65 |
| Analgesic selection in poorly controlled pain | 60 | Determining and discussing prognosis in advanced cancer | 61 |
| Etiology of opioid-induced nausea | 59 | Determining and discussing prognosis in renal failure | 53 |
| Pharmacology of transdermal fentanyl | 57 | Death pronouncement | 42 |
| Pharmacology of oral morphine | 56 | Assessing decision-making capacity | 35 |
| Differential diagnosis of worsening cancer pain | 53 | Physician-assisted suicide: definition | 40 |
| Use of meperidine in sickle cell crisis | 51 | Managing request to withhold bad news | 0 ^a |
| Choice of adjuvant analgesics in bone pain | 50 | Terminal care | |
| Addiction: definition of psychological dependence | 50 | Use of artificial hydration | 73 |
| Choice of adjuvant analgesics in neuropathic pain | 34 | Prognosis factors in cancer | 59 |
| Methadone and respiratory depression | 31 | Medicare hospice benefit: covered services | 58 |
| | | Medicare hospice benefit: eligibility | 43 |
| | | Assessing grief vs depression | 42 |

Table 2. Palliative Care Knowledge Examination: Pretest-Posttest Transition Probability^a

^a All students correctly answered this item on both the pretest and posttest.

tive and hospice care. Each item is rated on a 10-point Likert-type scale (on which 10 is the highest rating).

In addition, students in this study also completed a course evaluation and alumni survey. On the course evaluation, students rated course objectives, topics, and presentation methods. The alumni survey was administered 6 months to 1 year following completion of the palliative care course. Participants rated the extent to which their participation in the course helped them integrate palliative care into their practice.

Results

- *Palliative Care Knowledge Examination.* Pretest scores on the Palliative Care Knowledge Examination ranged from 10 to 27 (mean \pm standard deviation, or SD, 20.23 \pm 3.52), and posttest scores ranged from 15 to 36 (mean \pm SD, 25.97 \pm 4.95). A paired comparison of means revealed a statistically significant improvement on the posttest ($t = -7.31$, $df = 61$, $P = .001$).

An item-by-item transition probability score was calculated to determine the proportion of students

who transitioned from an incorrect item response on the pretest to a correct response on the posttest (Table 2). Results demonstrated that students improved their knowledge on nearly all items, with an average transition score of 60% across all domains. Highest average transition scores were seen in the knowledge domains of “assessment and management of pain” and “nonpain symptoms and syndromes.” Lowest transition scores were seen in the areas of methadone-related respiratory depression and diagnosis of malignant hypercalcemia. A review of course content revealed that minimum emphasis was given to these 2 content areas, accounting for the low transition rate. Course modifications have been made in these areas, as they are important aspects of palliative and end-of-life care. All students selected the correct response on both the pretest and posttest for the item pertaining to withholding bad news; no change was seen on this item.

- *Self-Assessment Survey.* Thirty-nine students completed the Self-Assessment Survey, which reflects those students who were coded on this survey as SRNAs at

| Overall, how effective do you believe you are in: (Scale: 0 = not at all effective; 10 = very effective) | Pretest score (mean ± SD) | Posttest score (mean ± SD) | t | P |
|---|--------------------------------------|---------------------------------------|----------|----------|
| Engaging in decision making with patients, families, and healthcare team members | 5.9 ± 2.1 | 7.9 ± 1.0 | -5.84 | < .01 |
| Overall care in the final hours of life | 6.1 ± 2.2 | 8.1 ± 1.2 | -4.86 | < .01 |
| Communication with family caregivers | 6.3 ± 2.0 | 8.2 ± 1.3 | -4.73 | < .01 |
| Differentiating between palliative and hospice care | 6.0 ± 2.3 | 8.1 ± 1.4 | -4.48 | < .01 |
| Pain management | 4.7 ± 2.9 | 6.9 ± 2.0 | -3.70 | < .01 |
| Communication with palliative care patients | 5.5 ± 2.3 | 7.0 ± 1.2 | -3.32 | < .01 |
| Interdisciplinary teamwork | 6.1 ± 2.2 | 8.1 ± 1.2 | -3.09 | < .01 |
| Communication with other members of the healthcare team | 7.2 ± 2.0 | 8.0 ± 1.6 | -2.57 | < .01 |
| Cultural issues in palliative care | 6.3 ± 2.0 | 7.1 ± 1.5 | -2.13 | < .05 |
| Management of other symptoms (physical, psychosocial, spiritual) | 6.6 ± 1.7 | 7.3 ± 1.4 | -1.93 | NS |

Table 3. Paired Comparison of Means on the Precourse and Postcourse Self-Assessment Survey
Abbreviation: NS indicates not significant.

the time of data collection. Table 3 presents the paired comparison of means for each of the 10 dimensions of the survey. Results show that students believed the course helped improve their effectiveness in 9 of the 10 dimensions. The greatest change, based on *t*-value distributions, was noted in 4 areas: engaging others in decision making; overall care in the final hours; communicating with family caregivers; and differentiating between palliative and hospice care.

- *Course Evaluations and Alumni Data.* Analysis of course evaluations and alumni data revealed overall satisfaction with the course modules. Ratings across modules ranged from 5.1 to 5.4, with 6 as the highest rating possible. Overall, students believed that the module format was clear and useful, important concepts were highlighted, and content was easy to follow and understand. Students also thought that the topics were relevant to their practice and that module objectives were achieved. Several students suggested lengthening the course instead of offering it in a compressed format. Ninety-five percent indicated that their practice behavior would likely change as a result of their participation in this course.

Students also evaluated the usefulness of the simulation and case discussion experiences. Ratings averaged 5.2, with 6 as the highest rating allowed. Overall, students felt that these experiences provided them with strategies on how to apply communication concepts and techniques to palliative care-related needs of patients, families, and team members; assist patients, families, and team members with palliative and end-of-life care decisions; and apply palliative care principles to the physical, emotional, and psychosocial needs of patients with end-of-life concerns.

Course alumni reported that as a result of their par-

ticipation in the palliative care course, they were more aware of palliative care issues in clinical practice and how patients can benefit from palliative care. Many commented that, because they were now better informed about palliative care, they were better able to advocate for their patients by initiating early referrals to palliative care and hospice.

Discussion

Given the strong clinical backgrounds that SRNAs, and subsequently CRNAs, bring to the practice arena, it is important to evaluate the impact these providers could have on the growing field of palliative and end-of-life care. Although this study looked at the knowledge and attitudes of only SRNAs, it is clear that the skills CRNAs bring to patients in need of palliative and end-of-life care are substantial. Although CRNAs already possess competency in many areas, they often lack the opportunity to put these skills into practice in palliative and end-of-life care.

Practice of palliative and end-of-life care would benefit from the extensive pain and symptom management skills that CRNAs could bring to this societal issue. Encouraging nurse anesthetists to actively look for ways to engage in dialogue about their contributions to palliative and end-of-life care is needed. Given the intense nature of curricula for nurse anesthesia programs, it is important to think creatively to build this practice opportunity. Adding additional content to nurse anesthesia programs that builds on strong communication, physiology/pathophysiology, pharmacology, and symptom management might be difficult, but adding palliative and end-of-life care dimensions to case discussions and clinical simulations will enrich the student experience and expand the skills of graduates.

Student registered nurse anesthetists understand these

issues better than most because of their clinical practice backgrounds in primarily critical care units, where they daily faced questions related to palliative and end-of-life care. In the context of this course, it became apparent that the SRNAs not only had excellent skills on which to build but also saw themselves as an important part of this practice area.

For example, during the clinical simulation of the patient with progressive lung cancer, the SRNAs often remarked that they had found themselves in situations when patients and families asked their opinion related to care options or resources available to them. Because palliative and hospice care is such a fast-growing area of patient care, the nurse anesthetist must possess the skills needed to participate in meaningful discussion with patients, families, and the healthcare team.

Research done by Temel et al¹⁷ suggests that initiating palliative care strategies at the time of diagnosis actually lengthened a patient's life nearly 3 months. The patients in this study had metastatic lung cancer, and they saw improvement in quality-of-life measures as well as overall physical activity. Both of these declined in the group that did not receive palliative care. The study also revealed that patients in the palliative care group reported 50% fewer symptoms of depression. Because CRNAs often provide care to patients with advanced cancer, their ability to advocate for palliative care referrals is essential. Understanding that palliative care does not interfere with either the patient's wish to continue treatment or the plans of the treating healthcare provider is an important aspect of education in palliative and end-of-life care.

Some may argue that palliative and hospice care is beyond what CRNAs should engage in. However, what better place to use all of the skills and knowledge, from both nursing and nurse anesthesia, is there than in this practice setting? Nurse anesthetists can make meaningful contributions by assisting individuals who have life-limiting disease. Certified Registered Nurse Anesthetists can be a part of the solution for the growing national healthcare problem of gaps in provision of palliative care.

Conclusion

Through completion of a palliative care course, SRNAs improved their knowledge and attitudes about palliative and hospice care. More research is needed to clarify how CRNAs can expand their scope of practice into this practice setting.

Future research should include the impact that palliative care education has on patient care outcomes, the use of this new knowledge by SRNAs who transition into clinical practice, and the potential interest in expanding CRNA scope of practice to include this very important aspect of care.

REFERENCES

1. Emanuel LL, von Gunten CF, Ferris FD, Hauser JM, eds. *The Educa-*

tion in Palliative and End-of-life Care (EPEC) Curriculum. Chicago, IL: EPEC Project; 2003.

2. End-of-Life Nursing Education Consortium (ELNEC). *ELNEC 50: State of the Art in Palliative Nursing*. Duarte, CA: City of Hope and American Association of Colleges of Nursing; 2008.
3. End of Life/Palliative Education Resource Center (EPERC). Educational materials. (nd) <http://www.eperc.mcw.edu/EPERC/EducationalMaterials>. Accessed March 15, 2011.
4. Hospice Association of America. Hospice facts and statistics. Washington, DC: National Association for Home Care and Hospice; 2002. <http://www.nahc.org/Consumer/hpccstats.html>. Accessed March 15, 2011.
5. National Hospice and Palliative Care Organization (NHPCO). NHPCO facts and figures: hospice care in America. Alexandria, VA: National Hospice and Palliative Care Organization; October 2009. http://www.nhpco.org/files/public/Statistics_Research/NHPCO_facts_and_figures.pdf. Accessed March 15, 2011.
6. Field MJ, Behrman RE, eds. When children die: improving palliative and end-of-life care for children and their families [electronic version]. Washington DC: Institute of Medicine, National Academies Press; 2002. http://books.nap.edu/openbook.php?record_id=10390. Accessed March 15, 2011.
7. Foley KM, Gelband H, eds. *Improving Palliative Care for Cancer*. Washington, DC: National Academies Press; 2001.
8. Field MJ, Cassel CK, eds. *Approaching Death: Improving Care at the End of Life*. Washington DC: Institute of Medicine, National Academies Press; 1997.
9. National Institutes of Health. *National Institutes of Health State-of-the-Science Statement: Symptom Management in Cancer: Pain, Depression and Fatigue, July 15-17, 2002 final statement*. Washington, DC: National Institutes of Health; 2002.
10. Bickel-Swenson D. End-of-life training in U.S. medical schools: a systematic literature review. *J Palliat Med*. 2007;10(1):229-235.
11. Hewitt M, Simone J, eds. *Ensuring Quality Cancer Care*. Washington DC: National Cancer Policy Board, Institute of Medicine, National Academies Press; 1999.
12. National Consensus Project for Quality Palliative Care. *Clinical Practice Guidelines for Quality Palliative Care*. Brooklyn, NY; 2004.
13. National Quality Forum. A national framework and preferred practices for palliative and hospice care quality. Washington, DC: National Quality Forum; 2007. http://www.qualityforum.org/Publications/2006/12/A_National_Framework_and_Preferred_Practices_for_Palliative_and_Hospice_Care_Quality.aspx. Accessed March 15, 2011.
14. World Health Organization. Cancer: palliative care. 2003. <http://www.who.int/cancer/palliative/en/>. Accessed March 15, 2011.
15. Weissman D. *Palliative Care Knowledge Examination*. Milwaukee, WI: MCW Research Foundation; 2005.
16. City of Hope Beckman Research Institute. The End of Life Attitudes Survey for RNs, LVNs or HHAs. In: *Instruments Used in End of Life Care Education*. Duarte, CA: City of Hope; 1999.
17. Temel JS, Greer JA, Muzikansky A, et al. Early palliative care for patients with metastatic non-small-cell lung cancer. *N Engl J Med*. 2010;363(8):733-742. <http://www.nejm.org/doi/pdf/10.1056/NEJMoa1000678>. Accessed March 15, 2011.

AUTHORS

Margaret Faut Callahan, CRNA, PhD, FAAN, is dean and professor at Marquette University College of Nursing, Milwaukee, Wisconsin. Email: Margaret.Callahan@marquette.edu.

Susan Breakwell, RN, DNP, APHN-BC, is associate professor, Rush University College of Nursing, Chicago, Illinois.

Rosemarie Suhayda, RN, PhD, is director, University Assessment, and associate professor, Rush University College of Nursing.

ACKNOWLEDGMENT

This study was supported by research grant R25-A114084 from the National Institutes of Health, National Cancer Institute, Bethesda, Maryland.