

## A Quality Improvement Intervention to Increase Palliative Care in Nursing Homes

LAURA C. HANSON, M.D., M.P.H.,<sup>1</sup> KIMBERLY S. REYNOLDS, M.P.A.,<sup>2</sup>  
MARTHA HENDERSON, M.S.N., D.Min.,<sup>3</sup> and C. GLENN PICKARD, M.D.<sup>1</sup>

### ABSTRACT

**Context:** Death is common in nursing homes, but access to palliative care is limited.

**Objective:** To test whether a quality improvement (QI) intervention in nursing homes increases hospice, pain management, and advance care planning.

**Design and setting:** The QI intervention was tested in seven nursing homes using a pre-poststudy design. Two additional nursing homes served as control sites.

**Participants:** Nine nursing homes serving 1169 residents.

**Intervention:** The intervention included recruitment and training of Palliative Care Leadership Teams in each facility, followed by six technical assistance meetings for team members. Hospice providers delivered six educational sessions for all nursing home staff using a structured curriculum. Teams received feedback of performance data on hospice enrollment, pain management, and advance care planning at 0, 3, and 6 months.

**Main outcome measures:** Percentage of residents receiving hospice or palliative services, pain assessment, pain treatment among residents in pain, and documented advance care planning discussions.

**Results:** Intervention facilities increased hospice enrollment from 4.0% of residents at baseline to 6.8% postintervention ( $p = .01$ ) and increased pain assessments from 18% to 60% ( $p < .001$ ). Among resident in pain, orders for nonpharmacologic pain treatments increased from 15% to 35% ( $p < .001$ ), but pain medication use did not change. Residents with in-depth discussions about end-of-life care increased from 4% to 17% ( $p < .001$ ). There were no significant changes in control sites.

**Conclusions:** A quality improvement intervention was effective in increasing hospice enrollment, pain assessment, nonpharmacologic pain treatment, and advance care planning discussions.

### BACKGROUND

**N**URSING HOMES ARE an increasingly common site for end-of-life care. Over 1.75 million Americans reside in nursing homes, and 43% of individuals who reach age 65 will spend time liv-

ing in a nursing home.<sup>1</sup> In 1958, approximately 6% of U.S. deaths took place in a nursing home, but by 1997 24% of nontraumatic deaths occurred in long-term-care institutions.<sup>2-4</sup> Only a minority of nursing home residents return to hospitals for terminal care; analysis of the 1993 National Mor-

<sup>1</sup>Division of Geriatric Medicine, School of Medicine, University of North Carolina at Chapel Hill.

<sup>2</sup>Department of Health Behavior and Health Education, School of Public Health, School of Nursing, University of North Carolina at Chapel Hill.

tality Follow-back Survey indicates that 66% stay in their nursing home beds for the final days of life.<sup>5</sup>

Death is a frequent occurrence in nursing homes, yet few clinical quality standards promote excellence in palliative care for those who die in this setting.<sup>6</sup> Recently bereaved family members express greater dissatisfaction with nursing home care than with any other aspect of end-of-life care.<sup>7</sup> Nursing home residents have high rates of untreated pain and other unmet needs for emotional support, personal care assistance, and communication about treatment decision making.<sup>8-13</sup> Beginning in 1989, the Medicare program expanded reimbursement to provide for hospice care in nursing homes. Two recent studies provide evidence that hospice improves the quality of end-of-life care in nursing homes,<sup>14,15</sup> but organizational and structural barriers limit the use of hospice as the provider of all palliative care in this setting.<sup>16,17</sup> Hospice serves 5.6% of nursing home residents who die, while the remainder rely on the quality of services delivered by nursing home staff.<sup>16</sup> Interventions to improve end-of-life care in nursing homes may be most effective if they concurrently promote hospice enrollment and enhance the quality of care delivered by nursing home staff.

Quality improvement methods were first developed for application in other organizational settings, but this method has proved effective in varied health care quality initiatives. QI assumes that a leadership team takes responsibility for improvements in practice. It combines education, data-driven performance assessment and feedback, and incremental action steps to motivate and facilitate change.<sup>18</sup> Previous studies in inpatient and outpatient practices demonstrate successful practice change using quality improvement methodology.<sup>19</sup> Continuous quality improvement interventions have resulted in improved pain and symptom management, more equitable access to dialysis, shorter ICU stays, and improved quality of cardiac care.<sup>20-25</sup> QI has rarely been studied in nursing homes, although the Centers for Medicare and Medicaid Services promotes QI projects in this setting. Building on this evidence, we designed a quality improvement intervention in nursing homes using a pre-poststudy design with control sites. The intervention had three aims: (1) to increase hospice enrollment, (2) to increase pain assessment and treatment for residents with pain, and (3) to in-

crease documented advance care planning discussions.

## METHODS

### *Sites*

The study took place in nine nursing homes recruited in central North Carolina between January 2001 and December 2002. Seven nursing homes were intervention sites, and two nursing homes were randomly chosen to be control sites.

Intervention nursing homes ranged in size from 80 to 200 beds, serving an average census of 870 residents. One of the seven intervention facilities was organized for profit, and six were nonprofit. Four facilities were hospital owned, though none of these were contiguous with an acute care hospital. Two sites had >60% Medicaid residents and two sites were part of continuing care retirement communities (CCRCs). Two nursing homes from the same geographic area served as control sites.

The two control sites were a nonprofit CCRC and a for-profit facility with >60% Medicaid beds, serving an average census of 299 residents. All sites, both intervention and control, had existing contracts with hospice agencies.

### *Quality improvement intervention*

The intervention used the plan-do-study-act design for quality improvement interventions. The primary study design was a pre-post comparison of quality indicators in intervention nursing homes, with pre-post comparison in control sites to test for temporal trends.<sup>26</sup> It included a 3-month recruitment and planning phase and a 9-month intervention phase. The recruitment and planning phase began with an initial meeting with local hospice providers to seek their endorsement and collaboration. Hospice providers generated a preliminary list of all local nursing homes with hospice contracts, to which investigators sent an invitation to participate. Investigators then met with interested nursing home leaders (usually directors of nursing or other clinical leadership) and provided a detailed explanation of the project, time commitments and expectations, potential benefits, and confidentiality protections. Nursing homes with continued interest were then enrolled with administrator endorsement. Clinical leaders at 10 nursing homes initially agreed to participate, but one withdrew be-

fore the study began due to turnover in leadership staff. Two nursing homes were selected randomly as control sites, and investigators delivered the intervention in the remaining seven facilities.

Investigators asked each intervention nursing home to identify an interdisciplinary Palliative Care Leadership Team. Team members from all sites participated in a 1-day conference covering hospice enrollment and services, pain management, advance care planning communication, and quality improvement techniques. During the intervention phase, participating nursing homes received monthly on-site education and technical assistance in QI methods. Six in-service educational sessions were available to all clinical staff. Sessions were based on a structured curriculum designed for nursing homes.<sup>27</sup> Local hospice providers delivered all on-site education sessions, and most sites videotaped sessions to facilitate delivery to evening, night, and weekend staff. Palliative Care Leadership Teams also participated in monthly strategy meetings with investigators and local hospice providers to design and implement stepwise organizational changes. During these meetings, investigators assisted nursing home staff to design procedures and documentation tools to improve pain assessment, pain treatment, advance care planning, and hospice referral. The teams completed monthly action plans that defined accomplishable tasks and assigned responsibility for these tasks to team members. They also received and responded to performance data recorded at baseline, 3 months, and 6 months. Research assistants collected data in control nursing homes at baseline and 6 months, but investigators did not provide feedback data reports to these sites.

Participating nursing homes received no monetary or direct incentives. They received all educational and strategy sessions free of charge and obtained free educational materials and chart documentation tools from the research team. Hospice educators and investigators provided refreshments at meetings and offered regular encouragement and positive comments to Palliative Care Leadership Teams to boost morale and dedication to the project.

### *Measurement and analysis*

Investigators developed a structured chart abstraction instrument, and pairs of investigators piloted chart abstraction on 15 charts in each of

two different facilities. The pilot demonstrated good feasibility and excellent interrater reliability ( $\kappa \geq .80$  all items), and the instrument was not modified. Trained research assistants abstracted data on resident demographics, health status, and palliative care quality indicators in a 50% random sample of residents in small facilities and a 33% random sample of residents in large facilities at baseline, 3 months, and 6 months after the start of the intervention. Data collection occurred at the same time intervals in control sites. One investigator consistently supervised all chart abstraction procedures.

Each chart review covered a 2-month interval prior to the date of chart abstraction. Residents' age, race, sex, and primary diagnoses were abstracted from the general information in the front of each record. Chart abstractors used residents' most recent quarterly Minimum Data Set (MDS) form to obtain information on cognitive skills for daily decision making, with a range from 0 (independent) to 4 (severely impaired); Functional Ability Score, with a range from 0 (fully independent in performing all ADLs) to 28 (total dependence in all ADLs); frequency (none, less than daily, or daily) and intensity (mild, moderate, or severe) of pain in the past 7 days; and variables to calculate a previously validated index of mortality risk, the Flacker Mortality Index.<sup>28</sup>

Palliative care quality indicators were given to nursing home sites in 0 and 3- and 6-month feedback reports and are the primary evaluation measures for the intervention. The participating hospice agency provided hospice enrollment data, measured as the percent of all residents enrolled in hospice or receiving hospice palliative care consultation services during the preceding 2 months. We did not count residents who were referred to hospice but who died before enrollment. Chart abstractors reviewed all sampled charts for documented pain assessments that tracked presence or absence of pain, pain severity, pain location, and/or pain frequency. Since use of pain assessment tools was low at baseline, data on pain treatment were abstracted for residents in pain according to their most recent MDS. One facility did not use the MDS or any other baseline method of identifying a resident with pain. We therefore excluded data from this facility in our analyses of pain treatments. We included data from this facility in all other analyses. The abstractors reviewed all care plans and orders for pain medications and evidence of systematic use

of nonpharmacologic treatments for pain, such as massage, repositioning, or relaxation techniques. The latter treatments were recorded only if chart documentation explicitly mentioned use for pain. For documentation of advance care planning discussions, abstractors reviewed care plan notes, advance directives, and any documentation recorded in the advance care planning section of residents' charts for a written record of a discussion, including participants and content of discussion. Chart abstractors did not review physician or nurse progress notes for evidence of advance care planning discussions, based on the assumption that information buried in a chart in such a manner would not be readily available to guide treatment decisions. Chart abstractors collected additional data on orders limiting life-sustaining treatments, living wills, and health care powers of attorney, but simple presence of these documents did not count as evidence of an in-depth discussion of treatment preferences.

Researchers entered the quantitative data into SPSS 10.1 and used this software package to generate summary descriptive statistics. Pre- and postintervention performance measures were compared for control and intervention sites. Categorical measures were compared using chi-square tests for analysis of statistical significance.

The University of North Carolina School of Medicine's Committee for the Protection of Human Subjects reviewed and approved all study methods.

## RESULTS

### *Palliative care leadership team participation*

Each intervention nursing home created and sustained an interdisciplinary Palliative Care

Leadership Team. Membership in teams varied, but all teams had the participation of nursing leadership and nurses who provided direct care. (Table 1)

The 41 Leadership Team members who attended the 1-day training conference took a brief pretest of knowledge in palliative care and a comparison posttest with demonstrated improvement in correct responses. (Table 2) At the time of the pretest, 66% of participants felt confident in their abilities to provide good palliative care; when the posttest was administered, 85% expressed confidence in their palliative care skills.

### *Resident characteristics*

Nursing home residents in the intervention sites had an average age of 82 (Table 3). Eighty-one percent were women, and 74% were white. Seventy-six percent of residents had some degree of cognitive impairment, and 43% had a dementia diagnosis. Their median Functional Ability Score was 17, with 5% of residents reported as independent in ADLs and 13% of residents reported as entirely dependent in all ADLs. As measured by the Flacker Mortality index,<sup>28</sup> 22% of residents in the intervention sites had a 50% or greater risk of dying within the next year. The control nursing homes had a somewhat younger population, a smaller percentage of females, and a higher percentage of African Americans than did the intervention sites, but did not differ significantly on functional status, mortality risk, or major diagnoses.

### *Changes in palliative care measures pre- and postintervention*

The intervention nursing homes experienced a significant increase in hospice enrollment after in-

TABLE 1. NURSING HOME STAFF MEMBERS IN PALLIATIVE CARE LEADERSHIP TEAMS

<i>Staff positions</i>	<i>Number of participants</i>
Directors of nursing and assistant DONs	11
Other nurses	13
Certified nursing assistants	11
Social workers	9
Staff development coordinators	5
MDS coordinators	4
Administrators	3
Activities directors	3
Nurse practitioner or physician assistant	2
Other (housekeeper, admission coordinator, chaplain, dietician, therapy staff)	10

TABLE 2. PRECONFERENCE AND POSTCONFERENCE ASSESSMENT OF PARTICIPANTS' PALLIATIVE CARE KNOWLEDGE

Topic	% Correct pretest (n = 41)	% Correct posttest (n = 41)
Recognize signs of chronic pain	61	73
Know that individuals with dementia can often use a pain scale	37	73 <sup>a</sup>
Recognize value of scheduled pain medications	78	93
Know that narcotics taken to treat pain are rarely addictive	80	95 <sup>a</sup>
Know difference between power of attorney and health care power of attorney	28	63 <sup>a</sup>
Understand legal standards for choices about artificial nutrition and hydration	62	92 <sup>a</sup>
Recognize signs and symptoms of terminal illness	60	80 <sup>a</sup>
Feel confident in ability to provide excellent palliative care	66	85 <sup>a</sup>

<sup>a</sup> $p \leq .05$ , chi-square.

tervention, from 35 residents at baseline to 59 residents at the end of the intervention period (4.0% vs. 6.8%,  $p = 0.01$ ) (Table 4).

Completed pain assessments among all residents increased in intervention nursing homes from 18% at baseline to 60% after intervention ( $p < .001$ ). Pain treatments were measured among residents judged to be in pain according to their most recent MDS. At baseline, 39% of residents in intervention nursing homes and 25% of residents in control nursing homes were recorded as having pain on their most recent MDS. The prevalence of pain on MDS, which measures pain experienced despite treatment,

did not change over time: 38% of residents in intervention sites and 26% of residents in control sites were in pain on the most recent MDS at 6-month follow-up. Orders for pain medication in the subset of residents in pain on the MDS trended upward from 77% to 81%, but this difference was not statistically significant. In secondary analyses stratifying residents on pain severity (moderate or severe vs. mild) and frequency (daily vs. less than daily), pain medication use also did not change within strata. Orders for nonpharmacologic treatments for residents in pain on the MDS increased significantly from 15% to 34% ( $p < .001$ ).

TABLE 3. CHARACTERISTICS OF NURSING HOME RESIDENTS

Baseline characteristics	Intervention sites n = 345	Control sites n = 113
Sex, female	81%	71% <sup>a</sup>
Age, mean years (range)	82 (22–102)	78 (30–98) <sup>a</sup>
Race		
African American	25%	36% <sup>a</sup>
White	74%	62%
Cognitive impairment		
Mild	18%	21%
Moderate	40%	38%
Severe	18%	26%
Functional ability score, median (range)	17 (0–28)	17 (0–28)
Diagnoses		
Dementia	43%	37%
Stroke	25%	31%
CHF	21%	32%
COPD	9%	10%
Cancer	6%	5%
ESRD	3%	7%
1-Year Mortality Risk $\geq 50\%$	22%	29%

<sup>a</sup> $p \leq .05$ .

TABLE 4. QUALITY INDICATORS IN INTERVENTION NURSING HOMES

Quality indicator	Baseline (%) (n = 345)	Postintervention (%) (n = 346)
Residents with hospice or palliative care	4.0	6.8 <sup>a</sup>
Residents with pain assessment	18	60 <sup>a</sup>
Residents in pain on MDS with pain medication (n = 135)	77	81
Residents in pain on MDS with non-pharmacologic treatment (n = 135)	15	34 <sup>a</sup>
Residents with DNR order	58	65 <sup>a</sup>
Residents with DNR indicator on chart	45	60 <sup>a</sup>
Residents with documented discussion on end-of-life care preferences	4	17 <sup>a</sup>

<sup>a</sup>*p* ≤ .05, chi-square test.

Documented advance care planning discussions were rare at baseline. Intervention nursing homes had a significant increase from 4% to 17% of residents with a documented discussion (*p* < .001). Use of DNR orders increased slightly in intervention nursing homes (58% to 65%, *p* = 0.04), as did use of DNR flags or external chart indicators of the presence of a DNR order. Use of living wills (31% vs. 30%) and health care powers of attorney (27% vs. 33%) were unchanged.

*Palliative care measures in control sites*

There were no significant baseline differences between intervention and control sites for measures of hospice or palliative care use, pain assessment, pain treatment, or documented advance care planning discussions. Comparing baseline and 6-month follow-up measures in the control facilities, we found no changes in palliative care quality measures. Enrollment in hospice or palliative care, rates of pain assessment and treatment, and rates of advance care planning, including documented discussions about end-of-life care wishes, did not change.

**COMMENT**

One in four adult deaths now takes place in a nursing home. Access to hospice and other palliative care services is limited in this setting, and dying residents have unmet needs for pain and symptom management and advance care planning. A quality improvement intervention using a structured curriculum and systematic feedback of performance data was successful at increasing access to palliative care for nursing home resi-

dents. The intervention resulted in a threefold increase in the use of structured pain assessments, doubling in rates of hospice enrollment, and a fourfold increase in detailed discussions of end-of-life treatment preferences. Use of nonpharmacologic pain treatment doubled for residents in pain, but rates of pain medication for this subset of residents were high at baseline and did not change. This study is the first controlled trial to demonstrate improvement in hospice enrollment and palliative care practices for nursing home residents. Although palliative care practices at the end of the 6-month intervention could still be improved, this study demonstrates a promising approach to change end-of-life care in nursing homes.

The intervention was designed to increase access to hospice while concurrently improving palliative care practices of nursing home staff. The intervention resulted in a doubling of hospice enrollment in the intervention facilities over 6 months. The baseline enrollment prevalence (4.0%) is higher than the 1% prevalence reported in 1997 by Petrisek and Mor.<sup>16</sup> We chose to measure overall prevalence rather than percent of decedents with hospice, which averaged 5.6% in 1997. Hospice enrollees must have a prognosis of 6 months or less, if the disease follows its usual course. This condition may be difficult to meet for the majority of nursing home residents who die from diseases with less predictable terminal trajectories, such as congestive heart failure and dementia.<sup>29</sup>

Although many Americans die in nursing homes, it is not clear what percent achieve eligibility for hospice care. In 1999, over 20% of nursing home decedents in Florida had hospice, the highest rate of use in the nation.<sup>30</sup> Without

changes in hospice eligibility, it is clear that the large majority of dying nursing home residents will continue to receive all their care from on-site staff. We therefore also designed the intervention to include hospice providers as local palliative care experts, to encourage nursing home staff to regard them as a source of education in addition to direct patient care. Staff training in palliative care did not replace hospice services, but may have concurrently improved some aspects of pain management and advance care planning for additional residents.

The intervention increased pain assessment for nursing home residents. For residents said to be in pain on the MDS, the intervention resulted in increased nonpharmacologic pain treatment, but no significant change in medication orders. The nonphysician staff who participated in Palliative Care Leadership Teams controlled increases in pain assessment and nonpharmacologic treatment, but not medication orders. Medication use may have remained constant because current use was relatively high and judged clinically effective or because the intervention did not target prescribers. Physicians spend very limited time in nursing homes and may find it difficult to change pain medications based on nursing assessments alone. Direct intervention with physicians and other prescribers may be necessary to change medication use. Volicer and Ackerman and Kemle have reported innovative approaches in individual physicians' nursing home practices.<sup>31,32</sup> Keay et al. provided chart audit with education in palliative care for nursing home physicians and found significant improvements among those physicians who completed the education program.<sup>33</sup> Weissman et al. also used quality improvement methods to change pain management policies and procedures in nursing homes, but did not directly measure physician practices.<sup>34</sup>

The baseline level of advance care planning discussions was low, related to our selection of a very conservative operational definition of these discussions. Nonetheless, a fourfold increase was possible during a 6-month intervention, and reports of discussions were available in the front of patients' records, where they were very likely to be used at the time of a serious or critical illness.

Study results should be considered in light of certain limitations. As is common in quality improvement work, the intervention took place in one state among nursing homes with an existing hospice contract, which may limit generalizabil-

ity. To minimize this concern, we purposely extended the intervention to two different regions and to a diverse group of nursing homes. A second limitation is that control and intervention sites differed in some baseline measures, due to a high number of potential variations in characteristics among small numbers of sites. Despite this limitation, the absence of temporal trends in control sites strengthens our conclusion that the quality improvement intervention caused practices in palliative care to change over time. The design choice to measure pain treatments only among residents who were assessed as being in pain according to their most recent Minimum Data Set may limit the validity of this measure. Residents with effectively treated pain may have been excluded by this strategy, as were residents whose pain was present but unrecognized by the MDS coordinators. This approach allowed for study of only those residents most likely to need pain treatment, but also reduced our sample size and power to detect a difference in pain medication orders. Finally, this study used process measures as quality indicators. This approach is usual in quality improvement research because health care providers are best able to change processes of care; however, we cannot directly infer an impact on resident outcomes. Measures of outcome are particularly challenging in the nursing home population, with over 50% prevalence of dementia and limited presence of family surrogates on site. Enrollment in hospice, new discussions of treatment preferences, and added nonmedication treatments for pain are substantive changes in end-of-life care practices and are likely to have a significant impact on the experience of dying residents.

This study has several strengths that enhance its internal and external validity. We designed the intervention using all components of the plan-do-study-act model for quality improvement.<sup>18</sup> Data measures were planned and piloted in advance and used consistently throughout the study.<sup>35</sup> The traditional time series design of quality improvement studies was strengthened by the use of randomly selected concurrent controls to rule out temporal trends in nursing home populations or practices as an alternative explanation for improvements. Evaluation of the intervention was based on changes in clinical behaviors, such as hospice enrollment, treatment orders, and advance care planning discussions, rather than changes in policies or chart documentation proce-

dures. The intervention was replicated in multiple sites representative of a range of nursing home organizational characteristics.<sup>36</sup> As further evidence of its effectiveness, we have subsequently replicated the intervention using simpler data collection strategies in two additional nursing homes in a new geographic area. In these two new sites, hospice enrollment showed a nonsignificant increase from 1.9% to 3.1%, pain assessment increased from 15% to 87% of residents, and documented advance care planning discussions increased from 6% to 22% of residents.

A further strength of the intervention design is its potential for dissemination. QI interventions are often difficult to replicate due to the complexity and variability of interventions and the effect of specific charismatic change agents in an organization. This project used a published educational curriculum including clinical guides for pain assessment, treatment, and advance care planning. Its quality measures are based on a pretested and reproducible data abstraction tool. Hospice agencies were recruited as collaborators for each geographic cluster of nursing homes, and the hospice providers rather than the investigators were often given credit for project leadership by the nursing home staff. No member of the research team had clinical responsibilities or other formal affiliation with the nursing home sites. Hospice providers conducted all educational sessions and attended most quality improvement meetings. These characteristics make it plausible that other hospice organizations may use the published materials in interested nursing homes to disseminate the intervention. The hospice agencies involved in this intervention were large, well-staffed organizations with solid financial footing and staff time to commit to special projects. The ability to implement a project such as the one described in this paper may be limited to similarly positioned organizations and to nursing homes with hospice contracts.

In conclusion, we have found that a quality improvement intervention in nursing homes successfully increased access to palliative care services, including hospice, pain assessment, and nonpharmacologic pain treatment and advance care planning discussions. Numerous studies have documented poor-quality care at the end of life, and few intervention designs have changed the delivery of care to dying patients. Quality improvement is a promising methodology to improve end-of-life care in nursing homes.

## ACKNOWLEDGMENTS

Special thanks to Judi Lund Person of the National Hospice and Palliative Care Organization and Susan Balfour of the Carolinas Center for Hospice and End of Life Care for sage advice and support in the design and implementation of the study. We are grateful to collaborating hospices and nursing homes for their invaluable time and commitment. Duke Endowment and the Open Society Institute's *Project on Death in America* provided funding for this research and did not influence study design, analysis, or interpretation of research data.

## REFERENCES

1. Kemper P, Murtaugh CM: Lifetime use of nursing home care. *N Engl J Med* 1991;324:595-600.
2. Katz BP, Zdeb MS, Therriault GD: Where people die. *Public Health Rep* 1979;94:522-527.
3. Sager MA, Easterling DV, Kindig DA, Anderson, OW: Changes in the location of death after passage of Medicare's prospective payment system: A national study. *N Engl J Med* 1989;320:433-439.
4. Teno JM: Facts on dying. ([www.chcr.brown.edu/dying/factsondying.htm](http://www.chcr.brown.edu/dying/factsondying.htm)) Accessed June 2003.
5. Hanson LC: Creating excellent palliative care in nursing homes. *J Palliat Med* 2003;6:7-9.
6. Keay TJ, Taler GA, Fredman L, Levenson AS: Assessing medical care of dying residents in nursing homes. *Am J Med Quality* 1997;12:151-156.
7. Hanson LC, Danis M, Garrett J: What is wrong with end-of-life care? Opinions of bereaved family members. *J Am Geriatr Soc* 1997;45:1339-1344.
8. Bernabei R, Gambassi G, Lapane K, Landi F, Gatsosnis C, Dunlop R, Lipsitz L, Steel K, Mor V: Management of pain in elderly cancer patients. *JAMA* 1998; 279:1877-1882.
9. Hanson LC, Henderson M, Menon M: As individual as death itself: a focus group study of terminal care in nursing homes. *J Palliat Med* 2002;5:117-125.
10. Ferrell BA: Pain evaluation and management in the nursing home. *Ann Intern Med* 1995;123:681-687.
11. Reynolds K, Henderson M, Schulman A, Hanson LC: Needs of the dying in nursing homes. *J Palliat Med* 2002;5:895-901.
12. Bradley EH, Peiris V, Wetle T: Discussions about end-of-life care in nursing homes. *J Am Geriatr Soc* 1998; 46:1235-1241.
13. Levin JR, Wenger NS, Ouslander JG, Zellman G, Schnelle JF, Buchanan JL, Hirsch SH, Reuben DB: Life-sustaining treatment decisions for nursing home residents: who discusses, who decides and what is decided? *J Am Geriatr Soc* 1999;47:82-87.
14. Baer WM, Hanson LC: Families' perception of the

- added value of hospice in the nursing home. *J Am Geriatr Soc* 2000;48:879–882.
15. Miller SC, Gozalo P, Mor V: Hospice enrollment and hospitalization of dying nursing home patients. *Am J Med* 2001;111:38–44.
  16. Petrisek AC, Mor V: Hospice in nursing homes: a facility-level analysis of the distribution of hospice beneficiaries. *Gerontologist* 1999;39:279–290.
  17. Zerzan J, Stearns S, Hanson L: Access to palliative care and hospice in nursing homes. *JAMA* 2000;284:2489–2494.
  18. Berwick DM: *Escape Fire: Designs for the Future of Health Care*. San Francisco: Jossey-Bass, 2004.
  19. Lynn J, Nolan K, Kabacene A, Weissman D, Milne C, Berwick DM for the End-of-Life Care Consensus Panel: Reforming care for persons near the end of life: the promise of quality improvement. *Ann Intern Med* 2002;137:117–122.
  20. Sehgal AR: Impact of quality improvement efforts on race and sex disparities in hemodialysis. *JAMA* 2003;289:996–1000.
  21. Eagle KA, Mulley AG, Skates SJ, Reder VA, Nicholson BW, Sexton JO, Barnett GO, Thibault GE: Length of stay in the intensive care unit: effects of practice guidelines and feedback. *JAMA* 1990;264:992–997.
  22. Bradley EH, Holmboe ES, Mattera JA, Roumanis SA, Radford MJ, Krumholz HM: A qualitative study of increasing beta-blocker use after myocardial infarction: why do some hospitals succeed? *JAMA* 2001;285:2604–2611.
  23. O'Connor GT, Plume SK, Olmstead EM, Morton JR, Maloney CT, Nugent WC, Hernandez F Jr, Clough R, Leavitt BJ, Coffin LH, Marrin CA, Wennberg D, Birkmeyer JD, Charlesworth DC, Malenka DJ, Quinton HB, Kasper JF: A regional intervention to improve the hospital mortality associated with coronary artery bypass graft surgery. *JAMA* 1996;275:841–846.
  24. Ferguson TB, Peterson ED, Coombs LP, Eiken MC, Carey ML, Grover FL, DeLong ER et al: Use of continuous quality improvement to increase use of process measures in patients undergoing coronary artery bypass graft surgery: a randomized controlled trial. *JAMA* 2003;290:49–56.
  25. Greco PJ, Eisenberg JM: Changing physicians' practices. *N Engl J Med* 1993;329:1271–1273.
  26. Berwick DM: Continuous improvement as an ideal in health care. *N Engl J Med* 1989;320:53–56.
  27. Henderson ML, Hanson LC, Reynolds KS: *Improving Nursing Home Care of the Dying*. New York: Springer, 2003.
  28. Flacker JM, Kiely DK: A practical approach to identifying mortality-related factors in established long-term care residents. *J Am Geriatr Soc* 1998;46:1012–1015.
  29. Lunney JR, Lynn J, Foley DJ, Lipson S, Guralnik JM: Patterns of functional decline at the end of life. *JAMA* 2003;289:2387–2392.
  30. Miller SC, Intrator O, Gozalo P, Roy J, Barber J, Mor V: Government expenditures at the end of life for short- and long-stay nursing home residents: differences by hospice enrollment status. *J Am Geriatr Soc* 2004;52:1284–1292.
  31. Volicer L: Hospice care for dementia patients. *J Am Geriatr Soc* 1997;45:1147–1149.
  32. Ackerman RJ, Kemle KA: Death in a nursing home with active medical management. *Nurs Home Med* 1999;7:313–319.
  33. Keay TJ, Alexander C, McNally K, Crusse E, Eger RE: Nursing home physician educational intervention improves end-of-life outcomes. *J Pall Med* 2003;6:205–213.
  34. Weissman DE, Griffie J, Muchka S, Matson S: Building an institutional commitment to pain management in long-term care facilities. *J Pain Sym Manage* 2000;20:35–43.
  35. Nelson EC, Splaine ME, Plume SK, Batalden P: Good measurement for good improvement work. *Quality Manage Health Care* 2004;13:1–16.
  36. Speroff T, O'Connor GT: Study designs for PDSA quality improvement research. *Quality Manage Health Care* 2004;13:17–32.

Address reprint requests to:

Laura C. Hanson, M.D., M.P.H.

Associate Professor, Division of Geriatric Medicine  
and Program on Aging  
CB 7550, 258 MacNider  
University of North Carolina  
Chapel Hill, NC 27599

E-mail: Laura\_Hanson@med.unc.edu

Copyright of Journal of Palliative Medicine is the property of Mary Ann Liebert, Inc. and its content may not be copied or emailed to multiple sites or posted to a listserv without the copyright holder's express written permission. However, users may print, download, or email articles for individual use.