

# Does Receipt of Hospice Care in Nursing Homes Improve the Management of Pain at the End of Life?

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**OBJECTIVES:** To compare analgesic management of daily pain for dying nursing home residents enrolled and not enrolled in Medicare hospice.

**DESIGN:** Retrospective, comparative cohort study.

**SETTING:** Over 800 nursing homes in Kansas, Maine, Mississippi, New York, and South Dakota.

**PARTICIPANTS:** A subset of residents with daily pain near the end of life taken from a matched cohort of hospice (2,644) and nonhospice (7,929) nursing home residents who had at least two resident assessments (Minimum Data Sets (MDSs)) completed, their last between 1992 and 1996, and who died before April 1997. The daily pain subset consisted of 709 hospice and 1,326 nonhospice residents.

**MEASUREMENTS:** Detailed drug use data contained on the last MDS before death were used to examine analgesic management of daily pain. Guidelines from the American Medical Directors Association (AMDA) were used to identify analgesics not recommended for use in managing chronic pain in long-term care settings. The study outcome, regular treatment of daily pain, examined whether patients received any analgesic, other than those not recommended by AMDA, at least twice a day for each day of documented daily pain (i.e., 7 days before date of last MDS).

**RESULTS:** Fifteen percent of hospice residents and 23% of nonhospice residents in daily pain received no analgesics (odds ratio (OR) = 0.57, 95% confidence interval (CI) = 0.45–0.74). A lower proportion of hospice residents (21%) than of nonhospice residents (29%) received analge-

sics not recommended by AMDA (OR = 0.65, 95% CI = 0.52–0.80). Overall, acetaminophen (not in combination with other drugs) was used most frequently for nonhospice residents (25% of 1,673 prescriptions), whereas morphine derivatives were used most frequently for hospice residents (30% of 1,058 prescriptions). Fifty-one percent of hospice residents and 33% of nonhospice residents received regular treatment for daily pain. Controlling for clinical confounders, hospice residents were twice as likely as nonhospice residents to receive regular treatment for daily pain (adjusted odds ratio = 2.08, 95% CI = 1.68–2.56).

**CONCLUSION:** Findings suggest that analgesic management of daily pain is better for nursing home residents enrolled in hospice than for those not enrolled in hospice. The prescribing practices portrayed by this study reveal that many dying nursing home residents in daily pain are receiving no analgesic treatment or are receiving analgesic treatment inconsistent with AMDA and other pain management guidelines. Improving the analgesic management of pain in nursing homes is essential if high-quality end-of-life care in nursing homes is to be achieved. *J Am Geriatr Soc* 50:507–515, 2002.

**Key words:** nursing homes; hospice; pain management; analgesics

The prevalence of unrelieved pain is disturbingly high in nursing homes.<sup>1–4</sup> Considering that pain intensity increases as death nears<sup>5</sup> and that more than 20% of older adults in the United States die in nursing homes,<sup>6</sup> adequate pain management for dying nursing home residents is critical to achieving high-quality end-of-life care.

Most persons with cancer pain and nonmalignant pain can have their pain effectively treated,<sup>7–10</sup> with the option of terminal sedation as the last resort.<sup>11,12</sup> Still, nursing home physicians often fail to identify pain as a problem or to prescribe adequate pharmacological treatment for nursing home residents.<sup>1–4,10,13,14</sup> Additionally, when analgesics are prescribed in nursing homes, the medications used are often inconsistent with, and contrary to, recommended pain management for older adults.<sup>13</sup> Recognizing the need for improved pain management in nursing

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homes, the American Medical Directors Association (AMDA) recently published guidelines for managing chronic pain in nursing homes, which, among other things, identify analgesic medications not recommended for use in the nursing home population.<sup>15</sup>

Hospice care in nursing homes offers a collaborative opportunity for nursing homes and hospices to provide intensive palliative services to dying residents, including high-quality pain management. Hospice care has been provided in nursing homes since 1985, when the Medicare hospice benefit was extended to Medicare beneficiaries residing in nursing homes.<sup>16,17</sup> Because of the extension of the Medicare hospice benefit to nursing home residents, 24% of all hospice beneficiaries are estimated to reside in nursing homes (in 1996).<sup>18</sup> Still, only 6% of residents dying in nursing homes use hospice.<sup>18</sup> Whether increased utilization of the Medicare benefit in nursing homes is desirable is in part dependent upon evidence of the value added of hospice care in nursing homes. Such evidence is especially important in light of a report by the Office of the Inspector General of the Department of Health and Human Services that questioned the value of offering the Medicare hospice benefit in nursing homes.<sup>19,20</sup>

Two important early studies of hospice care focused on home- and inpatient-based models of hospice care and found few differences in terms of quality of life or symptom management between hospice and nonhospice patients.<sup>21,22</sup> Although not observed in both studies, one of the early studies found that hospice patients enrolled in hospital-based hospices were less likely than patients receiving conventional nonhospice care to have “persistent severe pain” at the end-of-life.<sup>23</sup> In this study, hospice patients in hospital-based settings were more likely than patients receiving conventional nonhospice care to have analgesic prescriptions and to have consumed analgesics, and hospice patients in home-based and inpatient-based settings were less likely to have received analgesics on an as necessary basis or by invasive methods such as intramuscularly or parenterally.<sup>24</sup> In a recent study of hospice care in nursing homes, family reports of symptom management for dying relatives/significant others before and after hospice enrollment support the notion that symptom management after hospice enrollment is of higher quality.<sup>25</sup>

The above work provides some support for the hypothesis that hospice care provided in institutional-based settings (nursing homes) may positively influence pharmacological pain management for dying nursing home residents and thus add value to end-of-life care in nursing homes. Because one of the desired outcome areas for hospice care is safe and comfortable dying,<sup>26</sup> and because pain management has been notoriously poor in long-term care settings,<sup>1-4</sup> we sought to quantify the extent to which receipt of hospice care is associated with superior analgesic management of daily pain in dying nursing home residents.

## METHODS

With a data use agreement from the Health Care Financing Administration (HCFA) in place, and after Institutional Review Board approval, we derived our sample from the Systematic Assessment of Geriatric Drug Use via Epidemiology database.<sup>27,28</sup> This database links data from nursing facility resident assessments collected using the

Minimum Data Set (MDS), drug information, HCFA claims data, and organizational data on nursing home providers. We used MDS data collected from 1992 to 1996 for nursing home residents in Kansas, Maine, Mississippi, New York, and South Dakota. These states volunteered to be part of the Case-Mix Reimbursement and Quality Demonstration project conducted by HCFA between 1989 and 1995 and, as such, had all MDS assessments computerized beginning in 1992. To identify hospice enrollment and death, we linked MDS data with 1991 through 1997 HCFA claims data and with HCFA's enrollment file. In this study, the successful matching of residents across data sources was 87%.

Nursing homes conduct standardized assessments of residents, and data from these assessments make up the MDS.<sup>29</sup> The MDS includes cognitive function, communication/hearing problems, physical functioning, continence, psychosocial status, diagnoses, health conditions/symptoms, medications, and numerous other items. In the period studied, resident assessments were required at admission (by the 14th day), quarterly, and annually. Reassessments were required when a resident was readmitted after hospitalization and when significant change occurred, although not necessarily upon hospice admission.

We derived the sample for the current study from a comprehensive study of the Medicare hospice benefit and of hospice care in nursing homes. The sample criteria for this study is provided in detail elsewhere.<sup>30</sup> Briefly, we identified 2,655 nursing home decedents whose last MDS occurred between 1992 and 1996, who died before April 1997, and who had at least two MDS assessments available. (For hospice enrollees one assessment had to be completed after hospice admission. Residents with a MDS after hospice admission had longer hospice stays (mean  $\pm$  standard deviation of  $132 \pm 138.5$  days; median 90) than those without an MDS after hospice admission ( $30 \pm 55.4$  days; median 12).) We did not require continuous hospice enrollment throughout the study period, because we believed that any exposure to hospice would be likely to result in sustained change in the approach to care. Additionally, if this was not the case, and residents who did not remain on hospice represented “hospice failures,” then to remove these residents from the hospice treatment group could result in an overstatement of the hospice effect. In this subset analysis, 12% of the hospice cohort ( $n = 82$ ) classified as receiving hospice were not receiving hospice at the time of the last MDS assessment.

We were concerned about the potential for diagnosis and underlying dementia, geographic variation, and time interval from last MDS assessment to date of death to distort the effects of hospice on processes of care. We eliminated the potential for these factors to confound the associations under study by forcing comparability of the distributions of these variables in the design stage. For each hospice resident who died, we identified up to three nonhospice nursing home residents who were matched by diagnosis group (cancer without dementia/Alzheimer's disease, cancer with dementia/Alzheimer's disease, dementia/Alzheimer's disease without cancer, and diagnoses other than cancer or dementia/Alzheimer's disease), state of nursing home residence, and length of time from last MDS assessment to death.

For the current study, we included only those decedents with documented daily pain on the MDS closest to

the date of death. Conceptually, we were interested in evaluating the pharmacological management of chronic pain. Although, the MDS pain variable does not distinguish between acute and chronic pain, because patients in this study were all terminally ill, we assumed that pain documented on the MDS was more likely to be chronic in nature.

Nursing home staff are supposed to evaluate symptoms and signs of pain in accordance with the MDS manual.<sup>29</sup> Cognitively intact residents are asked whether they had experienced any type of bodily discomfort daily over the 7 days preceding the assessment. To assess pain in seriously cognitively impaired nursing home residents, staff are supposed to evaluate nonverbal cues of pain, including moaning, crying, wincing, frowning or other facial expressions, or posture such as guarding or protecting an area of the body. Therefore, pain recording could have depended exclusively on the observation of signs of pain.<sup>1,29</sup> Information contained in the MDS does not indicate whether the recording of daily pain was based on observation or on patient self-report. During the study years, pain intensity was not recorded on the MDS. The median time from the documentation of daily pain and death was about 1 month.

### Drug Information

Nursing staff documented up to 18 medications (prescription and over the counter) taken within the 7 days before the assessment using the National Drug Coding (NDC) system. In addition to the NDC code, nursing staff recorded whether the order was standing or as needed, the route of administration, and the number of times per day administered. We classified the NDC codes into therapeutic class and subclass information using the Master Drug Data Base (MediSpan™).<sup>28</sup>

We classified analgesics as opioid (generally weaker opioids such as codeine phosphate and oxycodone hydrochloride and any combination of these compounds with nonopioid analgesics, and stronger opioids such as morphine sulfate, oxymorphone hydrochloride, and methadone hydrochloride) and nonopioid (salicylates, acetaminophen, and nonsteroidal anti-inflammatory drugs (NSAIDs)) medications. Based on the AMDA guidelines, we further classified analgesics as recommended or not recommended for treatment of chronic pain in long-term care settings. Medications not recommended included the NSAIDs indomethacin, piroxicam, tolmetin, and meclufenamate and the opioids butorphanol, propoxyphene, meperidine, nalbuphine, and pentazocine.<sup>15</sup> For each drug prescription identified, we calculated the frequency of administration and route of administration.

### Pain Management Outcome

In the absence of information on pain intensity, we were unable to determine the adequacy of pain management. Instead, we considered residents receiving any analgesic (other than analgesics not recommended by AMDA) at least twice a day or via a drug patch to be recipients of "regular treatment of daily pain." These residents may or may not have received a nonrecommended analgesic in addition to the recommended analgesic twice a day. The frequency of analgesic administration was calculated from both as needed and scheduled use.

### Analytic Approach

We compared the sociodemographic and clinical characteristics of dying nursing home residents by hospice and nonhospice enrollment status. We described the analgesics used for hospice and nonhospice residents by the major categories of opioids and nonopioids and by therapeutic class and subclass information within these categories. Percentages describe the receipt of analgesics by hospice and nonhospice residents via as needed versus standing orders and by invasive methods, such as intramuscularly. With respect to the particular analgesics deemed inappropriate,<sup>15</sup> we described their prevalence, their order status (as needed vs standing order), frequency of use, and median dose and range of doses received.

We considered demographic and clinical variables as potential confounders based on a systematic literature review and previous related work performed by the authors and their colleagues.<sup>1,4</sup> These variables include gender, race/ethnicity (non-Hispanic white vs all other ethnic groups combined), marital status (married, not married), age (65–74 vs <65, and ≥75), a six-point activities of daily living (ADL) index, the seven-point Cognitive Performance Scale (CPS),<sup>31</sup> and the presence of congestive heart failure, chronic obstructive pulmonary disease (COPD), and arthritis as recorded on the MDS. We also considered the presence of do not resuscitate (DNR) orders as a potential confounder.

We estimated the effect of hospice on the regular management of daily pain adjusted for confounders using logistic regression models with generalized estimating equations (GEE) in SAS GENMOD (SAS Institute, Inc., Cary, NC). The use of GEE adjusted for the correlation occurring because patients resided in the same nursing home. Because we had no evidence to the contrary, we assumed that patient independent variables were similarly related to the outcomes across all facilities. We retained variables in the model as confounders if they altered the effect of hospice (per odds ratio (OR)) by at least .05; they were also retained when they were independently associated with regular management of daily pain. From the final models, we derived adjusted ORs and 95% confidence intervals (CIs). We interpreted the ORs as relative risks. We estimated the predicted probabilities for eight subgroups (the four diagnosis groups by hospice/nonhospice status) by substituting average values for the covariates and applying the following formula:  $P = 1 / (1 + e^{-(\alpha + \sum \beta x)})$ . Ninety five percent CIs for this value were estimated by deriving the variance estimate of the linear function.<sup>32</sup> Last, we ran multivariate analyses and report here on the hospice effect when removing from the hospice cohort those residents who were not actively enrolled in hospice at the time of the last MDS.

## RESULTS

### Descriptive Comparisons of Hospice and Non-Hospice Patients

Hospice residents were slightly younger and more often female than were nonhospice residents (Table 1). Clinically, hospice and nonhospice residents were quite similar, although the small differences observed in the ADL and CPS scores were statistically significant (Table 1). As anticipated, greater proportions of residents enrolled in hospice

had advance directives documented than did nonhospice residents (Table 1).

### Management of Pain

Fifteen percent of dying hospice residents in daily pain received no analgesics, whereas 23% of dying nonhospice residents in daily pain received no analgesics (OR = 0.57, 95% CI = 0.45–0.74). In the 7-day period before the last MDS, 43% of hospice residents used only one analgesic type and 42% used two or more analgesic types. For nonhospice residents, 42% used only one analgesic type and 35% used two or more analgesic types.

Table 2 presents the analgesics prescribed for hospice and nonhospice patients in daily pain. Of the 2,731 analgesic prescriptions, 61.8% were for opioids and 38.2% were for nonopioids. A higher proportion of hospice residents used opioids (68% of 1,058 prescriptions) than did

nonhospice residents (58% of 1,673 prescriptions) (Table 2). Opioids and nonopioids are listed in Table 2 from the most frequently to the least frequently prescribed. For hospice residents, morphine derivatives were prescribed most often (30% of all analgesic prescriptions), followed by acetaminophen (18%), codeine derivatives (13%), fentanyl (transdermal) (12%), and propoxyphene-containing drugs (11%). For nonhospice residents, acetaminophen was used most frequently (25% of all analgesic prescriptions), followed by propoxyphene-containing drugs (19%), morphine derivatives (15%), and codeine derivatives (14%).

Prescriptions for hospice residents were ordered less frequently on an as needed basis (43% of 1,058) than were prescriptions for nonhospice residents (57% of 1,673). Twenty-three percent (165) of the hospice residents and 33% (437) of the nonhospice residents received analgesics only on an as needed basis. Hospice residents more frequently received analgesics topically (through transdermal patch) than did nonhospice residents (15% vs 7% of prescriptions with identified routes of administration for hospice and nonhospice, respectively). Similar percentages of hospice and nonhospice patients received analgesic prescriptions intramuscularly (3% vs 4% of prescriptions with identified routes of administration for hospice and nonhospice, respectively).

Some analgesics listed in Table 2 are not recommended for treatment of chronic pain in long-term care settings;<sup>15</sup> details of the prescriptions for these analgesics are listed in Table 3. Twenty-one percent of hospice residents and 29% of nonhospice residents received these nonrecommended analgesics (OR = 0.65, 95% CI = 0.52–0.80). Nonrecommended analgesics were often administered irregularly, in that there were often ordered on an as needed basis and were received less than seven times a week (Table 3).

Fifty-one percent of hospice residents and 33% of nonhospice residents received regular treatment for daily pain (any analgesic, other than analgesics not recommended by AMDA, at least twice a day or via a drug patch). Multivariate analysis reveals hospice enrollment to be significantly associated with a greater likelihood that dying nursing home residents receive regular treatment of daily pain (adjusted odds ratio (AOR) = 2.08; 95% CI = 1.68–2.56) (Table 4). Independent of hospice enrollment, an increased likelihood of adequate treatment for daily pain is also associated with the diagnosis group of cancer with no dementia (AOR = 1.51; 95% CI = 1.14–2.00) and with a diagnosis of arthritis (AOR = 1.22; 95% CI = 1.00–1.57). Factors associated with a reduced probability of receiving regular treatment for daily pain include being aged 75 and older (AOR = 0.55; 95% CI = 0.42–0.73), the presence of congestive heart failure (AOR = 0.65; 95% CI = 0.54–0.79), and residence in Mississippi (AOR = .33; 95% CI = 0.12–0.89) and South Dakota (AOR = 0.71; 95% CI = 0.50–0.99). The variables of gender and race/ethnicity and the presence of COPD were not included in the final model because they were not found to alter the hospice effect and were not independently associated with the receipt of regular management of daily pain. After removing those residents who were not actively enrolled in hospice at the time of the last MDS from the hospice cohort, the AOR for the hospice effect is slightly higher (AOR = 2.18, 95% CI = 1.75–2.71).

**Table 1. Comparisons of Hospice and Nonhospice Residents in Pain Included in Analysis (N = 2,035)**

Variable	Hospice (n = 709)	Nonhospice (n = 1,326)
<b>Age</b>		
<65, %	2.3	2.2
65–74, %	15.4	12.9
≥75, %	82.4	84.9
<b>Gender</b>		
Female, %	72.9*	60.7*
<b>Race</b>		
White, %	96.0	95.5
Black, %	3.8	3.7
Other, %	0.1	0.8
<b>Marital status</b>		
Married, %	22.3	22.4
<b>Diagnosis groups</b>		
Other, %	18.9	17.5
Cancer—no dementia, %	9.5	8.5
Cancer—with dementia, %	43.2	45.6
Dementia, %	28.5	28.5
Congestive heart failure, %	31.0	32.0
Arthritis, %	25.1	31.2
<b>Activity of daily living,<sup>†</sup></b>		
mean ± SD	4.0 ± 1.0**	3.8 ± 1.2**
<b>Cognitive performance scale,<sup>‡</sup></b>		
mean ± SD	3.0 ± 2.0*	2.8 ± 2.0*
<b>Advance directives</b>		
Do not resuscitate, %	85.9**	66.8**
<b>States</b>		
Kansas, %	48.5	49.3
Maine, %	4.4	5.9
Mississippi, %	0.9	1.2
New York, %	34.8	33.2
South Dakota, %	11.4	10.4

Note: For each variable, fewer than 1% of patients had missing values.

\* $P < .05$ ; \*\* $P < .001$

<sup>†</sup>0 (minimal oversight) to 5 (highly dependent)

<sup>‡</sup>0 (intact) to 6 (very severe impairment)

SD = standard deviation.

**Table 2. Analgesics Used by Hospice and Nonhospice Patients, Grouped by Opioids and Nonopioids**

Analgesics	Total Analgesics Used, n = 2,731	Hospice, n = 1,058	Nonhospice, n = 1,673
	n (%)		
Opioids	1,689 (61.8)	719 (68.0)	970 (58.0)
Morphine derivatives			
Morphine and morphine w/ Atropin	534 (19.6)	293 (27.7)	241 (14.4)
Hydromorphone	39 (1.4)	23 (2.2)	16 (1.0)
Propoxyphene-containing drugs	435 (15.9)	118 (11.2)	317 (18.9)
Codeine derivatives			
Codeine, codeine w/ acetaminophen, codeine w/ aspirin	145 (5.3)	56 (5.3)	89 (5.3)
Hydrocodone w/ acetaminophen, hydrocodone w/ aspirin	158 (5.8)	49 (4.6)	109 (6.5)
Oxycodone, oxycodone w/ acetaminophen oxycodone w/ aspirin	63 (2.3)	30 (2.8)	33 (2.0)
Fentanyl (transdermal)	210 (7.7)	127 (12.0)	83 (5.0)
Meperidine-containing drugs	83 (3.0)	18 (1.7)	65 (3.9)
Nonopioids*	1,042 (38.2)	339 (32.0)	703 (42.0)
Acetaminophen	602 (22.0)	186 (17.6)	416 (24.9)
Aspirin	161 (5.9)	48 (4.5)	113 (6.8)
Ibuprofen	100 (3.7)	31 (2.9)	69 (4.1)
Salicylates	26 (1.0)	20 (1.9)	6 (0.4)
Naproxen	25 (0.9)	12 (1.1)	13 (0.8)

Note: Patients could have received more than one analgesic.

\*Although included in the total n for nonopioids, analgesics that represented 1% or less of the nonopioids used were not listed individually. These drugs are nabumetone, tramadol, indomethacin, sulindac, salsalate, tromethamine, etodolac, diclofenac, oxaprozin, flurbiprofen, piroxicam, diflunisal, phenyltoloxamine, and phenylbutazone.

Table 5 displays the predicted probabilities of hospice and nonhospice patients receiving regular pain management, controlling for all factors in the regression model and stratified by diagnosis groups. Across all diagnosis groups, patients in the hospice cohort have higher probabilities of

receiving regular pain management. We evaluated (and ruled out) the hypothesis that the hospice effect differed by cancer/dementia group. It is noteworthy that, regardless of hospice status, patients with cancer and no dementia are most likely to receive regular management for daily pain.

**Table 3. Details Of Analgesic Prescriptions Not Recommended By AMDA**

Analgesics	Total Number of Analgesics Used n (%)*	Order Status						
		As Needed		Scheduled		Not Specified n (%)*		
		n (%)†	Frequency of use		n (%)†		Dosage (mg)	
<7/wk	≥7/wk		Range	(Median)				
Propoxyphene								
Total	434 (15.9)	271 (62.4)	155	114	89 (20.5)	50–800	(300)	76 (17.5)
Hospice	118 (11.2)	61 (51.7)	35	25	35 (29.7)	100–600	(300)	23 (19.5)
Nonhospice	316 (18.9)	210 (66.5)	120	89	54 (17.1)	50–800	(300)	53 (16.8)
Meperidine								
Total	83 (3.0)	61 (73.5)	42	19	13 (15.7)	50–2400	(200)	9 (10.8)
Hospice	18 (1.7)	15 (83.3)	10	5	2 (11.1)	300–2400	(1350)	1 (5.6)
Nonhospice	65 (3.9)	46 (70.8)	32	14	11 (16.9)	50–2400	(200)	8 (12.3)
Nalbuphine								
Total	10 (0.4)	8 (80.0)	4	4	1 (10.0)			1 (10.0)
Hospice	2 (0.2)	2 (100.0)	2	0	0 (0.0)			0 (0.0)
Nonhospice	8 (0.5)	6 (75.0)	2	4	1 (12.5)			1 (12.5)

Note: Only the three most frequently used analgesics (n ≥ 10) are shown.

\*Percentage of total analgesics used.

†Percentages across rows.

**Table 4. Effect of Hospice Enrollment on Regular Treatment of Daily Pain (N = 2,035)**

Variable	Odds Ratio	95% CI
Hospice enrollment	2.08	1.68–2.56
Age categories*		
<65	0.84	0.42–1.69
≥75	0.55	0.42–0.73
Diagnosis group†		
Dementia	0.98	0.64–1.51
Cancer—no dementia	1.51	1.14–2.00
Cancer—with dementia	1.25	0.91–1.71
Cognitive performance scale (per unit increase)	1.00	0.94–1.06
Activities of daily living (per unit increase)	1.00	0.90–1.11
Other diagnoses:		
Congestive heart failure	0.65	0.54–0.79
Arthritis	1.22	1.00–1.50
Advance directives: do not resuscitate order	1.25	1.00–1.57
States‡		
Maine	1.42	0.92–2.19
Mississippi	0.33	0.12–0.89
New York	0.85	0.68–1.06
South Dakota	0.71	0.50–0.99

\*Reference group is age 65–74.

†Reference group is 'other'.

‡Reference state is Kansas.

CI = confidence interval.

## DISCUSSION

This study supports the hypothesis that hospice care delivered in nursing homes is associated with superior pain management via the regular administration of analgesic treatment. Additionally, analgesic prescribing patterns for hospice residents were more consistent with recommended prescribing for residents in chronic pain in long-term care settings<sup>15</sup> than were prescribing patterns for nonhospice residents. These study findings are consistent with study findings of hospital-based hospice care performed almost two decades ago<sup>21</sup> and with family reports of higher-quality symptom management in nursing homes after hospice enrollment.<sup>25</sup> Although analgesic management of daily pain appears to be superior when hospice is involved, there is still substantial room for improvement in analgesic prescribing for all dying residents. The need for such improvement has been documented in other studies of pain management in nursing homes that did not focus on hos-

pice and nonhospice comparisons or on pain management at the end of life.<sup>1–4,10,13,14</sup>

Many of the analgesic prescribing patterns observed for nonhospice residents in this study were very similar to the patterns observed by Cramer et al. when examining management of pain in nursing homes.<sup>13</sup> If we exclude acetaminophen (which was considered as adjunctive pharmacotherapy by Cramer et al.), we found, similar to Cramer et al., that nonhospice dying residents in daily pain received propoxyphene-containing drugs most frequently and that propoxyphene with acetaminophen was the most frequently received analgesic. As documented by Ferrell in studying pain management in nursing homes,<sup>2</sup> we found that acetaminophen (not in combination) was the analgesic most frequently used by nonhospice residents in pain.

As documented in previous studies of pain management, we found that, independent of hospice enrollment, older patients were significantly less likely than younger patients to receive adequate pain management.<sup>14</sup> For hospice and nonhospice residents, those with cancer and no dementia had higher predicted probabilities of receiving regular treatment for their daily pain than did dying residents in the three other diagnosis groups. The lower probability of demented residents receiving regular treatment for their daily pain is consistent with other related studies showing decreased probabilities of pain management to be associated with cognitive impairment.<sup>33–36</sup> The significant association between the presence of a DNR order and the greater likelihood of receipt of regular pain management perhaps speaks to the acknowledgment of imminent death and a resulting emphasis on symptom palliation by nursing home staffs and physicians, alone and with hospice staff.

Although analgesic prescribing patterns for hospice residents were more consistent with recommended prescribing practices,<sup>10,15</sup> a high prevalence of undesirable prescribing practices for all dying residents was observed. High proportions of hospice and nonhospice residents received analgesics not recommended for use in managing chronic pain in long-term care settings.<sup>15</sup> Of these nonrecommended drugs, propoxyphene-containing drugs were prescribed most often. Propoxyphene is felt to be overprescribed in older adults because it has not been shown to be any more effective than aspirin or acetaminophen and has undesirable central nervous system side effects and the potential for renal injury.<sup>15,37</sup> Consistent with previous research,<sup>24</sup> hospice residents were less likely than nonhospice residents to have received analgesic prescriptions on an as needed basis. Nevertheless, even though receipt of analgesics on a regular basis rather than on an as necessary basis

**Table 5. Predicted Probabilities: Regular Treatment of Daily Pain**

Hospice Enrollment	Diagnosis Groups			
	Cancer No Dementia	Cancer with Dementia	Dementia	Other
	Mean Probability (95% Confidence Interval)			
Hospice	0.54 (0.52–0.56)	0.50 (0.47–0.52)	0.44 (0.37–0.50)	0.44 (0.41–0.47)
Nonhospice	0.36 (0.35–0.38)	0.32 (0.30–0.34)	0.27 (0.21–0.33)	0.28 (0.24–0.31)

is a fundamental principle of managing chronic pain,<sup>10</sup> substantial proportions of dying residents received analgesics only on an as needed basis (23% of hospice and 33% of nonhospice residents). Opioid prescriptions were used more frequently by hospice than by nonhospice residents, and hospice residents used stronger opioids such as morphine derivatives more often than nonhospice residents. Unlike the findings of Goldberg et al.,<sup>24</sup> few hospice/nonhospice differences were observed regarding invasive routes of analgesic administration, but hospice residents received fentanyl through a transdermal patch more frequently than nonhospice residents. Although the receipt of the long-acting opioid fentanyl reflects a recommended prescribing practice for constant moderate or severe pain, its use is cautioned, especially in opiate-naïve persons because of its potency and prolonged half-life.<sup>2</sup> The overall prescribing patterns observed in this study raise concern regarding the analgesic management of pain in nursing homes.

The prescribing practices portrayed in this study reveal that many dying nursing home residents in daily pain are receiving no analgesic treatment or analgesic treatment inconsistent with AMDA and other guidelines. Improving the analgesic management of pain in nursing homes is essential if high-quality end-of-life care in nursing homes is to be achieved. This improvement requires acquisition of knowledge regarding recommended prescribing practices and internal and external oversight to ensure that nursing home care reflects recommended practice.

Study findings support the notion that analgesic prescribing practices for chronic pain are superior when hospice care is made available to dying nursing home residents. However, even though hospice residents were more likely than nonhospice residents to receive an analgesic at least twice a day and appear to receive analgesics more in accordance with recommended prescribing practices, it is clear that hospice prescribing practices were not optimal. The barriers to further improvement in pharmacological management of daily pain with hospice enrollment may include poor coordination of care planning and processes between nursing home and hospice staff and perhaps even conflict over clinical responsibility, resistance to hospice care philosophies by nursing home staffs and patient physicians,<sup>17,38</sup> and lower quality of care in the nursing home setting provided by some hospice providers. Interviews of nursing home and hospice staff and of physicians and nursing home surveyors have indicated that differences in care philosophies and practice between nursing home and hospice staff, in part originating from the divergent nursing home and hospice goals that are promulgated by regulations (restorative care vs palliative care), make collaboration more difficult.<sup>38</sup> These differing foci result in new collaborations that are often beleaguered by suspiciousness of hospice staff and uneasiness with differing care approaches such as the higher dosages of opioids recommended by hospice or the lack of intervention by hospice when a dying resident chooses not to eat. In addition to this, the quality of pain management provided by hospices in nursing homes probably varies in relation to a hospice's experience in caring for dying patients with chronic terminal illnesses such as Alzheimer's disease and other dementias. Because hospices historically have cared for large proportions of patients with cancer, differing knowledge

and skills needed for pain assessment and management in the nursing home environment may need to be acquired. From interviews, it appears that mature nursing home/hospice collaborations result in care environments where knowledge, such as differing approaches to pain assessment and management, is routinely shared by both provider types.<sup>38</sup>

Several limitations of our study need to be recognized. First, our multivariate analyses could not control for all patient or facility selection bias. Nursing homes that choose to contract with hospices probably differ from those choosing not to contract with hospice. These facilities may already have superior analgesic prescribing practices than those facilities that do not contract with hospice. Alternatively, contracting with hospice programs, through diffusion of hospice philosophies and practice,<sup>39</sup> may have positively influenced a nursing home's pain management practices and resulted in less observable hospice/nonhospice difference in pain management practices. As with facility selection bias, we could not control for all the patient characteristics that predispose them to elect hospice care. There were clear differences in the rates of DNR, signaling other unmeasured differences that might speak to preferences. Also, nursing home residents referred to hospice have been identified as having palliative care needs, and these identified residents may be more likely to receive care directed at palliation even without hospice involvement. However, the considerations of possible referral bias and of hospice patient/family selection bias are not felt to be relevant in examination of our outcome of regular management of daily pain, because this outcome reflects minimal treatment, not the adequacy of analgesic prescribing in relation to a patient's pain intensity. Nevertheless, patient/family selection bias and referral bias may have influenced some of the differential prescribing practices observed in this study, such as the use of more opioid prescriptions by hospice patients.

The accuracy of the MDS data has been questioned.<sup>40</sup> However, studies have shown most MDS data to be reliable and valid.<sup>27,28</sup> Additionally, although some inaccuracies are present, there are no data to suggest, or reasons to believe, that inaccuracies would be different depending on hospice/nonhospice status. Furthermore, the similarities in the findings presented here with findings from similar studies of pain management in nursing homes that used a different data source<sup>13</sup> serve to further validate the accuracy of the drug data used in this study.

The AMDA recommendations regarding drugs to be avoided in long-term care settings are not specific to dying residents but to residents with chronic pain. Although we feel our assumption is valid regarding the chronic nature of daily pain experienced by the dying residents in this study, it is feasible that some daily pain may not have been chronic in nature.

Study findings reflect analgesic prescribing practices for hospice and nonhospice nursing home residents in the years 1992 through 1996. The practices observed in this study may have changed since 1996, especially because many efforts directed at improving pain management have been initiated in recent years. For example, the AMDA pain management guidelines<sup>15</sup> were published in 1999 and the American Geriatrics Society guidelines in 1998. Additionally, the Joint Commission on Accreditation of Health-

care Organizations issued pain management guidelines in 2000 and has incorporated compliance with these guidelines into its accreditation process.<sup>41</sup> Although these and other efforts may have resulted in improved analgesic management of pain in nursing homes, 1999 data show a high prevalence of persistent severe pain in U.S. nursing homes,<sup>42</sup> suggesting that substantial improvement in prescribing practices had not occurred by 1999.

Last, although it is likely that hospice may have similar effects in states not included in this study, the results presented here are not necessarily generalizable to states other than the study states of Kansas, Maine, Mississippi, New York, and South Dakota. Also, because hospice residents in daily pain in this study were required to have a MDS after hospice admission, these patients had longer average lengths of hospice stay. Therefore, study findings from this study cannot necessarily be generalized to hospice patients residing in nursing homes for short periods of time.

In conclusion, the analgesic management of chronic pain for dying nursing home residents is inconsistent with recommended practice; this finding raises concern about the quality of end-of-life care for dying nursing home residents. Large proportions of residents in daily pain received no analgesics, received analgesics not recommended by AMDA, or received analgesics only on an as needed basis. The provision of Medicare hospice care in nursing homes appears to be a viable means of improving analgesic prescribing practices and thus improving the quality of end-of-life care for nursing home residents. However, a large amount of concerted work on the part of hospices and nursing homes is needed to make this option work. Although hospice enrollment was associated with an increased likelihood of higher-quality pain management, a high proportion of hospice nursing home residents did not receive regular treatment of daily pain. With a strengthening of nursing home and hospice collaborative relationships, including an increase in the mutual sharing of information and improvements in care coordination and provision, a greater hospice effect may be observed. Ideally, future work should include the observation of pain management practices in nursing homes before and after hospice collaboration so as to provide valid data on the influence of the hospice collaboration on dying hospice and nonhospice nursing home residents. Furthermore, research must continue to examine the management of chronic pain in nursing homes so as to determine the efficacy of recent efforts directed at improving pain management in nursing homes.

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