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Palliative Care Consultations in Nursing Homes and End-of-Life Hospitalizations

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Abstract

Context—While specialty palliative care in hospital and outpatient settings is associated with lower acute care use, its impact in U.S. nursing homes (NHs) is unknown.

Objectives—To understand how NH use of palliative care consults is associated with end-of-life hospitalizations.

Methods—Seven consult providers in four states and 24 counties shared data on the number of consult visits and residents served (per NH) in study years 2000–2010. All NHs in the 24 counties were studied ($n=286$). A NH-level longitudinal file included consult data, aggregated Medicare resident assessment and claims data, and NH characteristics. Consult introduction was “yes” when 1% of residents received consults. Volume was the number of consult visits per 100 residents, annually. Panel multivariate regression with NH fixed-effects examined whether rates of hospital deaths and hospitalizations in the last 30 days of life differentially changed for NHs introducing consults, or increasing consult volume.

Results—One hundred seventy (59%) of the 286 NHs introduced consults by 2010. NHs with consults, compared to others, had residents with higher acuity and functional impairment, and lower nurse but higher nursing assistant staffing. Controlling for covariate differences and compared to NHs without consults, NHs introducing consults had a 1% (95% CI; $-0.021, 0.002$) greater reduction in hospital death rates and a 1.6% (95% CI; $-0.031, -0.002$) greater reduction in

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Disclosures

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hospitalizations in the last 30 days of life. No statistically significant associations between volume and study outcomes were observed.

Conclusion—The introduction of specialty palliative care consults in NHs is associated with overall reductions in end-of-life hospitalizations.

Keywords

palliative care; nursing homes; consults; Medicare; hospice

Introduction

Older adults in nursing homes (NHs) often have advanced serious illness, but access to specialty (skilled) palliative care in NHs is inadequate (1–4). Palliative care improves quality of life for persons with advanced serious illness by effectively managing pain and other symptoms and by incorporating psychosocial and spiritual care according to patient/family needs, values, and culture(s) (5). The Institute of Medicine (IOM) recommends palliative care be available for all persons with advanced serious illness, regardless of care setting (6). Hospice provides this access near the end of life and its use in NHs has grown (7). Still, the need for specialty palliative care often precedes the hospice eligibility criterion of a six-month terminal prognosis or a patient’s /family’s decision to choose hospice. Also, palliative care needs are often present during receipt of Medicare Part-A Skilled Nursing Facility (SNF) care, but concurrent Medicare hospice and SNF care is disallowed.

Research shows specialty palliative care delivered in hospital settings decreases care costs and intensity (8–10), and in outpatient settings lowers hospital and emergency room use, and hospital deaths (11, 12). Randomized controlled trials show improvements in patient/family quality of life accompany receipt of palliative care (12, 13). Our recent research in NHs shows NH decedents who receive specialty palliative care consults (i.e., consults primarily by nurse practitioners with palliative care expertise), compared to propensity-score matched controls, have lower end-of-life hospitalization rates and lower rates of (potentially) burdensome transitions near the end of life (14, 15). In related research, NH hospitalization rates for dying residents with *and* without hospice are observed to be lower when a NH’s hospice use is higher. (16, 17)

The research presented here aims to examine how consult introduction and use affects a NH’s overall hospitalization rates. It uses a prospective panel analysis (years 2000 to 2010) to examine how NH consult introduction and increases in consult volume may differentially change end-of-life hospitalization rates, compared to changes in NHs without consult introduction or increases in their use.

Methods

Study Population and Data

Since the receipt of palliative care consults (i.e., visits) in NHs could not be validly identified using claims data, we collaborated with seven providers of NH palliative care to quantify NH use of (externally provided) palliative care consults. Palliative care consults are

primarily provided by nurse practitioners with extensive palliative care training, under the supervision of certified palliative care physicians. Consult visits address symptom management needs, and diagnoses and prognoses are discussed. Unlike hospice, however, interdisciplinary team member visits are not routine (14).

The hospice-affiliated palliative care providers resided in four hospice certificate of need states and exclusively provided consults to NHs in 24 counties in years 2000 through 2010. A total of 317 NHs resided in the 24 study counties. Of these, we excluded NHs that operated for less than three years ($n=15$) and others with less than three years of data ($n=16$) because of missing outcomes data or fewer than five deaths in a given year. The final sample included 286 NHs in 24 counties that did or did not introduce specialty palliative care consults in study years 2000 through 2010.

The seven consult providers shared with us NH-level data for years 2000 through 2010 for NHs in which palliative care consults were provided. For each study year, data reported included each NH's name, address, provider ID, the number of unduplicated residents who received at least one palliative care consult visit, and the total number of palliative care visits made to residents at that NH. For NHs with no reported consult activity, we recorded a zero each year for total palliative care residents and visits. We created a NH-level longitudinal file by merging the yearly palliative care consult data with annual NH-level data from the Online Survey, Certification and Reporting (OSCAR) dataset, aggregated resident-level data derived from Medicare resident assessments (MDS) and claims data, and NH market data (i.e., county level data) obtained from the Area Resource File.

Variables of Interest

For each NH, we calculated the proportion of residents with palliative care consults in each study year by dividing the total number of (unduplicated) residents with consults by the total (unduplicated) number of residents. We considered the NH to have *introduced palliative care consults* (yes [1] or no [0]) when this proportion reached 1%. For each study year, we defined the annual *palliative care visit volume* as the number of palliative care NH visits per 100 (unduplicated) NH residents in the given year. Volume was specified as a continuous variable in our multivariate model, and recorded as 0 prior to consult introduction.

Only covariates that change over time were included in multivariate models. Resident aggregated MDS data linked to Medicare denominator and claims data were used to determine a NH index of activities of daily living, ranging from 4 to 18 (all NH residents ambulatory and independent in eating, toileting and transferring [4] to all NH residents bedfast and totally dependent in eating, toileting and transferring [18]) and a NH's mean case-mix index at admission. We used the resource utilization group (RUG III) system, which classifies residents into categories based on their estimated resource utilization. The higher the case-mix score, the more severe the average acuity profile of the residents in a NH. Using merged data we also determined the number of a NH's decedents each year, the percent of residents with dementia and the percent non-Hispanic White. A county-level Herfindahl index (0 to 1.0 [no competition]) derived from OSCAR NH bed data was included to control for the competitiveness of the NH's market. Also, using OSCAR data we calculated staffing variables including the presence of any nurse practitioner or physician

assistant, ratio of registered nurses to total nurses, total nursing hours per resident day, and nursing assistant hours per resident day. Additionally, we included the proportions of residents whose NH payer source was Medicare, Medicaid, or other (primarily reflects private pay). Using the OSCAR, we also controlled for occupancy rate, calculated as the total number of residents on the day of the OSCAR survey divided by the total number of beds. Last, we included a set of dummy variables to represent calendar year to control for time trends in the outcome variables.

Using our merged file, we created two outcomes variables. The first reflected annually the proportion of a NH's decedents who were hospitalized in the last 30 days of life, and the second the proportion who died in the hospital (within seven days of NH transfer).

Statistical Analysis

Means (with standard deviations [SDs]) were used to describe NH and market characteristics for NHs that introduced consults, compared to those that did not. Descriptive statistics also were used to describe palliative care visit volume over time.

We conducted panel multivariate regression analyses with NH fixed-effects. To do this, outcomes, covariate and palliative care values for each study year (2000–2010) were entered into the model. For example, the introduction of palliative care consults was coded 0 for all years when its introduction had not occurred and 1 for the year of introduction and subsequent years. Volume was coded 0 prior to introduction and as continuous variable subsequently. The panel fixed-effect model creates a unique intercept for each NH and thus allows for within facility comparisons and controls for all time-invariant unobserved NH characteristics, such as a NH's culture or prevailing attitudes that might impact hospitalizations or consult use. The model compares the outcome from a NH in a given year to outcomes from the same NH in other years. Therefore, using fixed effects modeling allows us to draw causal inferences from model estimates—to conclude how the introduction of palliative care consults, or their change in volume, differentially impacts changes in rates of hospitalizations. Without the use of NH fixed effects the estimates of the effects of palliative care consults could be biased (18). Analyses were conducted in Stata v. 13 (StataCorp LP, College Station, TX) with XTREGAR with FE (fixed effects) (19).

Results

Descriptive Findings

Among the 286 study NHs, 170 (59%) introduced palliative care consults. There were differences in NH characteristics between NHs with or without consult introduction (Table 1). In 2009/10, residents in NHs introducing consults had higher acuity (per RUGS case mix index) and higher functional impairment (per the ADL index; Table 1). NHs with consults had greater nursing assistant staffing, but lower nursing staffing; they also had a lower ratio of RNs to total nurses (0.35 versus 0.43, respectively; Table 1).

The mean number of residents receiving consults annually and the mean visit volume per NH (i.e., the number of consult visits annually per 100 unduplicated NH residents) doubled between the year of consult introduction and four years post (for the 102 NHs with four

years of data post introduction; Table 2). Fig. 1 shows the change over time by categories of NHs' annual visit volume. While in 2005, 30 NHs had at least five visits per 100 unduplicated residents, by 2010 approximately 65 NHs reached this volume. In 2005, there is a dramatic decrease in visits, but this discontinuity is a result of service reduction by one large consult provider.

Study Outcomes

Comparisons of end-of-life hospitalizations pre and post NH introduction of palliative care consults (weighted by number of deaths in facilities each year and including 148 NHs with pre and post data available) show that pre introduction, 29% (SD 0.109) of NH decedents were hospitalized in the last 30 days of life compared to 26% (SD 0.106) post introduction. Also, 16% (SD 0.086) of NH decedents died in hospitals pre introduction, compared to 14% (SD 0.079) post.

In panel multivariate analyses, the above differences were smaller (Table 3). After adjustment, those NHs introducing consults had an approximate one percentage point (coef -0.009 ; 95% confidence interval [CI] $-0.021, 0.002$) greater rate reduction in hospital deaths in the years post introduction, compared to NHs not introducing consults ($P=0.12$). For hospitalizations in the last 30 days of life, there was a 1.6 percentage point (coef 0.016; 95% CI $-0.031, -0.002$) statistically significant greater rate reduction after NHs introduced consults, compared to NHs who did not (Table 3).

There was no observed greater reduction in hospitalization rates when NHs increased, versus did not increase, their palliative care visit volume. Considering the other model covariates, a NH's annual number of decedents was consistently and significantly associated with both outcomes. With a one unit increase in a NH's number of decedents there was an approximate 0.05% rate decrease for both outcomes.

Discussion

To our knowledge this is the first study to examine how introduction of specialty palliative care consults affect NH hospitalization rates. We found U.S. NHs introducing specialty palliative care consults experienced greater overall reductions in end-of-life hospitalization rates, compared to NHs not introducing consults. While we did not observe greater reductions in hospitalization rates as consult visit volume increased, visit volumes, even with increases, were low. This study's finding of lower hospitalization rates with specialty palliative care introduction, together with previous study findings of palliative care in hospital and outpatient settings (8–13) and NH resident-level findings of lower acute care use with consult receipt (14,15), support the importance of including specialty palliative care in NHs to reduce (perhaps discretionary or undesired) end-of-life hospitalizations, and to thus potentially improve dying NH residents' quality of life.

In the years after NHs introduced specialty palliative care consults, their hospitalization rates in the last 30 days of life were 1.6 percentage points lower than in NHs without consults. While modest, this rate reduction also reflects a modest volume of palliative care consults. Introduction of consults likely reflects a greater NH emphasis on palliative care, and an

increased resident and staff exposure to palliative care expertise. However, unlike Zheng and colleagues (17), we did not observe an increase in exposure (i.e., a greater visit volume) to be associated with reduced hospitalizations even when in sensitivity analysis we tested the visit volume using a categorical variable with differing cutoffs. Our finding of no effect is probably related to the relatively small volume of NH palliative care consult recipients/visits compared to the volume of hospice care (17). Resident-level analyses (in NHs offering specialty consults), has shown 10% of decedents received consults in their last six months of life (14, 15); in contrast, 28% of Medicare beneficiaries dying in NHs received hospice (in 2005–2007) (17). Unlike hospice, however, a designated Medicare payment stream for palliative care consults does not exist. Consults are billed as NH visits under Medicare Part B and this payment is thought to be inadequate and thus a barrier to greater consult provision. (2) With creation of a designated payment stream, it is possible we could observe greater provision of specialty palliative care consults in NHs and resulting enhancement of primary palliative care skills of NH providers, just as greater hospice use appears to have affected the quality of palliative care in NHs (17).

NHs that introduced consults had lower nurse staffing and a lower RN to nurse ratio, yet their residents had higher (admission) acuity and functional dependence. Therefore, in addition to a greater emphasis on palliative care, these descriptive findings suggest that NHs introducing consults may have recognized that the specialty expertise offered through palliative care consults was particularly needed. Additionally, given the higher resident acuity (measured by a NH's admission RUGs score), NHs introducing consults may have had a greater proportion of Medicare Part-A SNF residents with palliative care needs. However, this portrayal of NHs with and without consults does not address the temporal sequencing of events. Further study is needed to better understand whether these NH characteristics drive consult use, or result from it.

There are limitations to this study that deserve comment. We did not have resident-level data. Therefore, while we observe overall rate reductions we could not examine the effect of consult introduction or volume increases for residents who did or did not receive consults. Consequently, overall rate reductions could be solely an effect of consult receipt with no “spill over” effect to non-consult residents. However, the small annual average number of NH residents receiving consults makes this scenario less likely. Also, while our site selection (to the extent possible) ensured consult providers exclusively provided consults in the counties studied, a study NH may have provided specialty palliative care consults internally and this would bias our findings towards the null. However, given the years studied and considering that even by 2015 very few NHs were providing specialty palliative care consults internally (1), any internal provision of specialty consults is likely to be very infrequent.

In this era of accountable care organizations and bundled payments, this study and others support the inclusion of specialty palliative care into the continuum care to reduce potentially inappropriate acute care use and to ensure care of persons with advanced serious illness is person/family-centered. Government, insurer and provider policies supporting this inclusion are needed to promote the value of the healthcare received in NHs and other settings.

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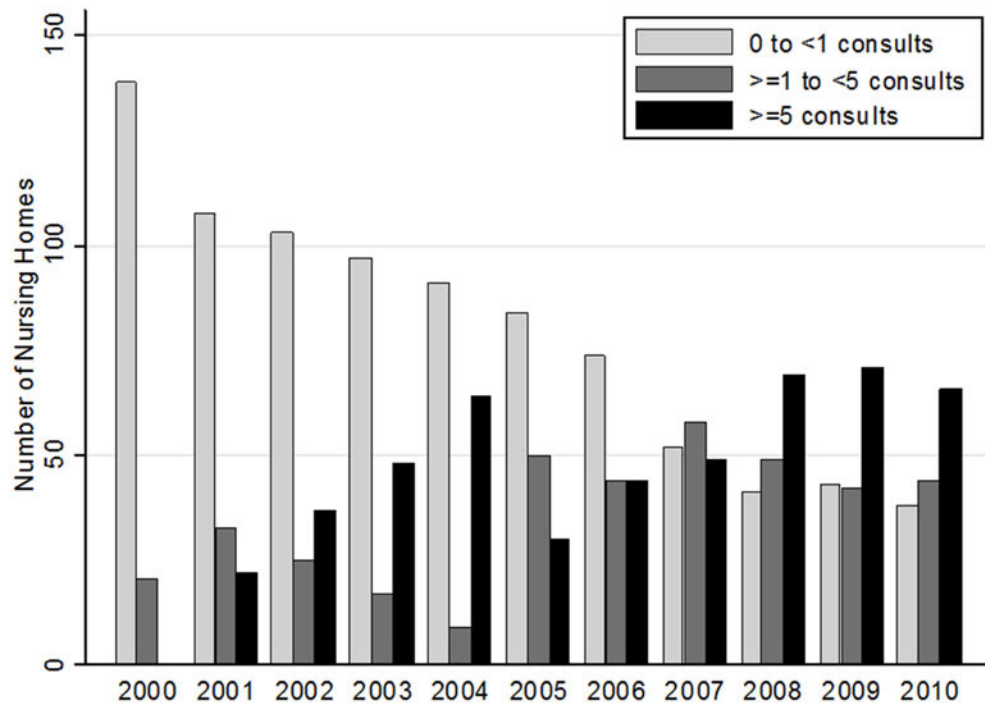


Figure 1. The Changing Palliative Care Visit Volume^a: Nursing Homes That Introduced Consults At Some Point during Study Years 2000–2010^b

^aNumber of palliative care visits annually per 100 unduplicated nursing home residents

^bIncludes 1,835 nursing home study years. Many nursing homes did not have (external) palliative care consults available in the early years and some facilities introducing consults reduced their use in the later years.

Table 1

Characteristics in 2010 of Nursing Homes Introducing and Not Introducing Palliative Care (PC) Consults

	NHs <u>without</u> PC Consults	NHs <u>with</u> PC Consults ^a
	2010 (n=92) ^b mean (SD)	2010 (n=159) ^c mean (SD)
Nursing Home Characteristics		
Occupancy rate	0.89 (0.09)	0.88 (0.08)
Total Beds	104.9 (43.01)	115.9 (48.0)
Total decedents in 2010	31.4 (15.1)	35.9 (19.7) *
Case Mix Index (RUGS) at admission	1.04 (0.08)	1.07 (0.07) **
Activity of Daily Living Index ^d	10.9 (1.12)	11.2 (0.95) *
Ratio of RN/RN+LPN	0.43 (0.22)	0.35 (0.21) **
Total RN hours/day/resident	0.54 (0.49)	0.42 (0.26) *
Total NA hours/day/resident	2.44 (0.59)	2.75 (0.69) ***
Nurse Practitioner/Physician Extenders	0.47 (0.50)	0.58 (0.50)
Percent of residents with Medicare	19.7 (19.7)	20.0 (17.3)
Percent of residents with Medicaid	57.2 (23.8)	57.5 (21.6)
Percent of residents with other payer	23.2 (16.1)	22.5 (12.8)
Percent of residents with dementia	45.8 (17.9)	50.7 (16.4) *
Percent of residents who are white	83.5 (19.4)	85.4 (14.8)
Market Characteristics		
Herfindahl Index for NH beds in county	0.13 (0.09)	0.10 (0.16)
Percent Urban	0.79 (0.41)	0.97 (0.18) ***

*
p<0.05,**
p<0.01,***
p<0.001

^a *PC consult use* is defined as the proportion of unduplicated NH residents receiving consults. When PC consult use reached 1%, a NH is considered exposed.

^b A total of 116 NHs were not exposed to PC consults. Some NHs closed. Data are reported for remaining 92 NHs. Of these, 86 NHs had 2010 data and 6 only had data through 2009.

^c A total of 170 NHs eventually adopted PC consults by 2010. In a given year, there were no more than 165 unique NHs with consults. Some NHs closed. Data are reported for remaining 159 NHs that had data in 2009/10 (148 NHs had 2010 data and 11 NHs had data through 2009).

^d Activity of Daily Living index ranges from 0–28, where 0=independent and 28=total dependence

RN, register nurse; LPN, licensed practical nurse; NA, nursing assistant; RUGS, resource utilization groups

Table 2

Changes in Mean Consult Patients and Visits after Consult Introduction

Introduction of Consults	Number of NHs	Mean PC Visit Volume (SD)^a	Mean NH Patients (SD)	Mean Visits per Patient (SD)
Year Introduced ^b	170	9.7 (12.67)	6.7 (5.65)	2.8 (1.74)
1 Year Post	155	13.3 (22.56)	10.2 (9.98)	2.8 (2.00)
2 Years Post	141	16.4 (22.35)	12.3 (13.99)	2.9 (1.85)
3 Years Post	117	19.1 (32.13)	13.7 (19.36)	2.6 (1.41)
4 Years Post	102	21.2 (48.74)	9.6 (17.11)	3.2 (2.02)

^aVisits per 100 unduplicated nursing home residents

^bMany nursing homes introduced consults in later study years, and thus data are not available to show consult use in one or more post years.

NH, nursing home; PC, palliative care; SD, standard deviation

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Table 3

Change in Nursing Homes' End-of-Life Hospitalization Rates after Introduction and Increase in Use of Palliative Care Consults: Panel Regression Models with Nursing Home Fixed Effects (n=2,550 NH years and 286 NHs)

Variables of Interest ^a	Outcomes	
	Hospital Death (Coefficient; 95% CI)	Hospitalization in the last 30 days of life (Coefficient; 95% CI)
Introduction of PC consults	-0.009 (-0.0207, 0.0022) ^b	-0.016 (-0.0314, -0.0016) ^{**}
Increased in Volume of PC Visits ^c	0.001 (-0.0004, 0.0024)	0.0003 (-0.0015, 0.0021)
Nursing-Home Level Covariates		
Ratio of RN/RN+LPN	0.013 (-0.0173, 0.0436)	0.001 (-0.0385, 0.0395)
Total RN hours/day/resident	-0.003 (-0.0111, 0.0051)	-0.002 (-0.0123, 0.0089)
Total NA hours/day/resident	0.006 (0.0018, 0.0106) ^{**}	0.002 (-0.0035, 0.0078)
Occupancy rate	-0.002 (-0.0454, 0.0405)	-0.064 (-0.1190, -0.0085) ^{**}
Any physician extender	-0.005 (-0.0119, 0.0017)	-0.003 (-0.0119, 0.0055)
Percent of residents with dementia	-0.0002 (-0.0005, -0.0000) [*]	-0.0001 (-0.0004, 0.0001)
Percent of non – Hispanic White residents	0.0001 (-0.0006, 0.0007)	-0.0001 (-0.0009, 0.0007)
Case Mix Index(RUGS) at admission	-0.006 (-0.0622, 0.0505)	0.046 (-0.0271, 0.1190)
ADL Index at admission	-0.001 (-0.0053, 0.0036)	-0.003 (-0.0092, 0.0022)
Number of decedents	-0.001 (-0.0009, -0.0004) ^{***}	-0.001 (-0.0009, -0.0002) ^{***}
Percent of residents with Medicaid	0.003 (-0.0011, 0.0070)	0.005 (-0.0001, 0.0103) ^{MS}
Percent of residents with Medicare	0.004 (-0.0003, 0.0092) ^{MS}	0.005 (-0.0016, 0.0106)
Herfindahl Index (county-level)	0.025 (-0.0622, 0.1132)	-0.072 (-0.1829, 0.0384)

^a Also controlled for calendars years 2001–2010 (reference year 2000)

^b p=0.12

^c Visits per 100 residents, by 5 visit increase

^{MS} p<0.10,

^{*} p<0.05,

^{**} p<0.01,

^{***} p<0.001

CI, confidence interval; PC, palliative care; RN, register nurse; LPN, licensed practical nurse; NA, nursing assistant; RUGS, resource utilization groups; ADL, activities of daily living