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Rehabilitation Therapy for Nursing Home Residents at the End-of-Life

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Abstract

Objective: Ultrahigh therapy use has increased in SNFs without concomitant increases in residents' characteristics. It has been suggested that this trend may also have influenced the provision of high-intensity rehabilitation therapies to residents who are at the end of life (EOL). Motivated by lack of evidence, we examined therapy use and intensity among long-stay EOL residents.

Design: An observational study covering a time period 2012–2016.

Setting and participants: New York State nursing homes (N = 647) and their long-stay decedent residents (N = 55,691).

Methods: Data sources included Minimum Data Set assessments, vital statistics, Nursing Home Compare website, LTCfocus, and Area Health Resource File.

Therapy intensity in the last month of life was the outcome measure. Individual-level covariates were used to adjust for health conditions. Facility-level covariates were the key independent variables of interest. Multinomial logistic regression models with facility random effects were estimated.

Results: Overall, 13.6% (n = 7600) of long-stay decedent residents had some therapy in the last month of life, 0% to 45% across facilities. Of those, almost 16% had very high/ultrahigh therapy intensity (>500 minutes) prior to death. Adjusting for individual-level covariates, decedents in the for-profit facilities had 18% higher risk of low/medium therapy [relative risk ratio (RRR) = 1.182, $P < .001$], and more than double the risk of high/ultrahigh therapy (RRR = 2.126, $P < .001$), compared to those with no therapy use in the last month of life. In facilities with higher physical therapy staffing, decedents had higher risk (RRR = 16.180, $P = .002$) of high/ultrahigh therapy, but not of low/medium therapy intensity. The use of high/ultrahigh therapy in this population has increased over time.

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Conclusions and Relevance: This is a first study to empirically demonstrate that facility characteristics are associated with the provision of therapy intensity to EOL residents. Findings suggest that facilities with a for-profit mission, and with higher staffing of therapists, may be more incentivized to maximize therapy use, even among the sickest of the residents.

Keywords

Rehabilitation therapy; nursing home; end-of-life

Nursing home payments are case-mix adjusted using the resource utilization groups (RUGs-IV), which classify patients into one of 66 categories reflecting clinical complexity and resource intensity. RUGs-IV is driven largely by the amount of rehabilitation therapy provided to a skilled nursing facility (SNF) resident. According to CMS, more than 90% of Medicare Part A-covered SNF days are paid based on RUGs-IV therapy categories.¹

Recent reports from the Office of the Inspector General (OIG), the Centers for Medicare and Medicaid Services, and from popular press suggest that the volume and the intensity of rehabilitation therapy provided to residents in US SNFs may be more extensive than is warranted by the residents' care needs. The OIG report from 2010 found that the proportion of RUGs for ultrahigh therapy (>720 minutes/wk) increased from 17% to 28% during 2006–2008 while the recipients' age, admitting diagnoses, and RUGs with high functional impairment scores remained largely unchanged. The report also noted that for-profit SNFs were more likely to bill for high-intensity therapy compared to not-for-profits—32% versus 18%, respectively.² The 2015 OIG report showed that SNF billings for higher levels of therapy have continued to increase. Between 2011 and 2013, the percentage of ultrahigh therapy days grew from 49% to 57%, whereas residents' characteristics stayed the same.³ In 2015, SNFs were reported to make a 6 times higher average daily profit margin from providing ultrahigh compared to low therapy intensity.¹

At least as concerning as the evidence suggesting some nursing homes may have exploited the prospective payment system to “optimize their revenues” is the claim by the OIG investigators that SNFs billed for therapy levels that were higher than reasonable or necessary, even among the most vulnerable residents. The OIG cited an example of a hospice patient who “received physical therapy 5 days a week for 5 weeks, even though her medical records indicated that she asked that the therapy be discontinued.”⁴ A 2016 report appearing in the Wall Street Journal quoted interviews with more than 2 dozen former SNF therapists and rehabilitation directors asserting that “managers often pressure caregivers to reach the 720-minute threshold” (required for ultrahigh therapy billing).⁵ Although the benefits of rehabilitative therapy in nursing homes are well established,⁶ pressures to maximize therapy may be inappropriate or even potentially injurious to some patients and may create obstacles to the provision of palliative and end-of-life (EOL) care in nursing homes.

Adding to already well-documented concern that nursing home residents at EOL often receive burdensome treatments inconsistent with their preferences or the optimum quality of care is the possibility that excessive and inappropriate rehabilitation provided to these residents may not be just sporadic, but rather represents a systemic problem as the overall

use and intensity of therapy “spill over.” Studies have shown that despite preferences many residents are hospitalized in the final weeks of life^{7–9} and receive burdensome treatments that may have few benefits.¹⁰ Research has suggested that nursing homes may be reluctant to refer their dying residents to hospice so as not to lose the opportunity to maximize a higher Medicare rate by providing rehabilitative therapy.^{11,12} Aragon and colleagues reported that nearly one-third of Medicare beneficiaries who were hospitalized received SNF-level care in the last 6 months of life and 9.2% died while on a SNF benefit.¹³ They argued that although such care may be appropriate for some, the receipt of SNF services at EOL is likely to prevent many patients from receiving hospice and/or palliative care that may be more consistent with their wishes and care needs. A recent study reporting on staff experiences with palliative care in nursing homes noted that staff’s desire to develop and provide quality palliative care services may conflict with the nursing homes’ need to maximize the provision of rehabilitative therapies. In the words of a staff member, “The goal is to get comfort measure people in therapy. They [residents] get the therapy; they [facility] get higher payment [reimbursement].”¹⁴

Despite studies suggesting that maximizing rehabilitative therapy may not be compatible with appropriate EOL care, we have not been able to identify a single empirical study focusing on this issue. Motivated by this lack of information, and by the reports suggesting possible overuse of therapy services in nursing homes, our objectives were twofold. First, we examined the longitudinal trend in the provision of rehabilitative therapy to long-stay decedent residents in their last month of life. Second, we identified variations in facility-level characteristics associated with high-intensity rehabilitative therapy use at the EOL.

Methods

Data Sources and Study Sample

We used the Minimum Data Set (MDS) for all New York nursing homes and their residents for October 2012–April 2016. The MDS contains data on patients’ assessments conducted by staff at admission, quarterly, annually, and whenever there is a significant change in health status. For residents covered by the Medicare Part A (ie, post-acute care), assessments are also conducted in specified windows near the 5th, 14th, 30th, 60th, and 90th days of stay. The MDS contains information on residents’ sociodemographics and on their functional, cognitive, diagnostic, and therapeutic status. Prior studies have demonstrated the MDS to be generally reliable and accurate, particularly on items included in the reimbursement model (eg, rehabilitative therapy).^{15–17} Although the MDS data are available nationally for all residents admitted to Medicaid- and/or Medicare-certified facilities, we used data that were available to us from another study, which covered all facilities and residents in New York State.

To identify decedent residents, we used Vital Statistics files for 2012–2016, merging them with the MDS data using the Medicare beneficiary identification number. Nursing home facility characteristics were obtained from the Nursing Home Compare website database maintained by the Centers for Medicare and Medicaid Services. Additional facility-level information was obtained from the Brown University LTCFocus data website (ltcfocus.org). We used the Area Health Resource File to identify rural/urban location.

The study population included Medicare beneficiaries aged 65 or older who were long-stay nursing home residents and died at the nursing home or within 3 days of discharge. Following prior studies and based on the algorithm used by the Centers for Medicare and Medicaid Services,¹⁸ we defined long-stay residents as those who were in a nursing home continuously for at least 90 days before death. Any rehabilitation therapy newly admitted residents may have had during their initial post-acute period would have been excluded from the analysis. Rehabilitation therapy obtained by residents who were deemed custodial or long-stay was included in the analysis, regardless of whether Medicare Part A (following a subsequent hospital stay) or Part B was the payer.

To examine the trend of therapy utilization over time, we separated the total time period into 4 intervals: year 1 (October 1, 2012–September 30, 2013), year 2 (October 1, 2013–September 30, 2014), year 3 (October 1, 2014–September 30, 2015) and partial year 4 (October 1, 2015–April 30, 2016). In each time interval, and for each decedent, we identified the last month as 30 days prior to the date of death. All therapy minutes occurring during this time interval, provided to long-stay residents, were summed.

We identified 55,691 decedent long-stay residents in 647 nursing homes for the entire study period, of whom 7600 received some therapy during the month preceding death.

The Institutional Review Board of the University of Rochester has approved this study.

Outcome Measure

In nursing homes, rehabilitative therapy can be provided individually to each resident, concurrently with another resident, and/or in a group setting. For each MDS assessment, receipt of therapy is documented for the past 7 days, and more than 1 type of therapy may be covered in each record—physical therapy, occupational therapy, and speech therapy. First, for each therapy type, we summed individual minutes of therapy provided as well as concurrent and group therapy minutes (which count as one-half and one-fourth, respectively).¹⁹ Total therapy time was constructed as the sum of all therapy minutes. Based on the RUG-IV system, therapy levels were defined as low (45–149 minutes), medium (150–324 minutes), high (325–499 minutes), very high (500–719 minutes), and ultrahigh (720 + minutes).

Covariates

Based on prior research and clinical experience, we identified individual-level factors that may be associated with rehabilitation use at the end of life.^{9,13,20} Sociodemographic characteristics included age at death, gender, race, and marital status. Clinical and diagnostic covariates included activities of daily living (ADL) impairment score (scale 0–28), cognitive function score (scale 0–3),²¹ presence/absence (1/0) of diagnoses (cancer, cardiovascular, diabetes, gastrointestinal, infections, malnutrition, musculoskeletal, other endocrine, psychiatric, pulmonary, and vision impairment), and an indicator for presence/absence (1/0) of hospitalization in the last 2 months of life. For clinical and diagnostic covariates, the most recent comprehensive assessment closest to the date of death (median within 26 days) was used.

The following facility-level factors were also included: profit status, chain membership, urban or rural location, occupancy rate, percentage of Medicare and Medicaid residents, staffing hours per resident per day for certified nurse assistants, licensed practical nurses, registered nurses, and physical therapists.

Statistical Analysis

Descriptive, longitudinal analyses of rehabilitative therapy use during the last month of life were performed. We assessed the proportion of decedents who received any therapy in the last 30 days of life, and the therapy intensity, based on their MDS assessment date and the date of death. We also performed bivariate analysis comparing decedents receiving and not receiving therapy prior to death on sociodemographic factors, clinical and diagnostic conditions, and with respect to the characteristics of facilities in which they resided. We fitted multinomial logistic regression models with facility random effects to estimate the probability of receiving low-to-medium, high-to-ultrahigh or no therapy in the last month of life. To account for possible time trend, year dummies were included.

Because speech therapy is sometimes indicated at the end of life to assist with swallowing difficulties, we conducted sensitivity analyses excluding speech therapy from the models and focusing only on the receipt of physical and/or occupational therapy. The results with and without speech therapy were not substantially different; therefore, we present findings for all therapy types combined.

Results

The proportion of decedent residents receiving therapy in the last 30 days of life increased annually from 11.6% to 12.4% and 14% in years 1 through 3, and 13.3% in the partial year 4.

During this time period, therapy intensity noticeably increased. In the earliest year, 4.4% of decedent residents received ultrahigh therapy, but by the end of the study period 7.3% obtained ultrahigh therapy (Figure 1). This was accompanied by a decline in low and medium therapy intensity and increases in high-to-ultrahigh levels. Most of the rehabilitative therapy that decedents received in the last month of life was concentrated in the last 7 days (48%), with almost 70% occurring during the 14 days prior to death (Figure 2).

Compared with residents who did not receive any therapy prior to death, therapy recipients were statistically, but not measurably, younger (86.55 vs 87.37) and less likely to be female (64.00% vs 69.87%). Therapy at the EOL was somewhat more common among minorities compared to whites (Table 1). Residents who were severely cognitively impaired were less likely to receive therapy (28.84% vs 34.24%). As expected, those hospitalized in the last 2 months of life were significantly more likely to be therapy recipients (60.01% vs 24.57%).

Several facility characteristics appear to influence therapy receipt. For example, residents receiving any therapy at the EOL were more likely to stay in for-profit nursing homes (57.12%) compared to those who did not receive any therapy (44.13%).

Using multinomial logistic regression models with facility random effects, we examined how therapy intensity at the EOL varied depending on facility characteristics (Table 2), while controlling for individual-level factors (Supplemental Table 1). Residents of for-profit facilities (as opposed to not-for-profits) had a 18% higher risk of receiving low-to-medium therapy intensity [relative risk ratio (RRR) = 1.182, $P < .001$], and more than 2-fold-higher risk of receiving high-to-ultrahigh therapy intensity (RRR = 2.126, $P < .001$), than of not receiving such therapy prior to death. Residents of chain nursing homes were also significantly more likely to receive low-to-medium therapy (RRR = 1.224, $P = .003$), but not the highest therapy intensity. Furthermore, greater availability of physical therapists in a facility was significantly associated with a substantially increased relative risk (RRR = 16.180, $P = .002$) of highest therapy intensity (compared to no therapy) being received at EOL. Higher registered nurse and licensed practical nurse staffing levels were associated with lower relative risk of receiving highest intensity of therapy. At the same time, higher levels of licensed practical nurse staffing were associated with increased relative risk of low-to-medium therapy (rather than no therapy) (RRR = 1.292, $P = .004$). Residents in facilities located in urban areas also had increased relative risk of receiving low-to-medium (RRR = 1.559, $P = .043$), but not the highest therapy intensity. Although higher proportions of Medicare and Medicaid residents were significantly associated with the receipt of highest therapy levels, the effect sizes were negligible.

For each therapy intensity grouping we also included the time trend. Over time, nursing home decedents faced higher risk of high-to-ultrahigh therapy. By year 4, decedent residents had 35% higher risk of high/ultrahigh therapy (RRR = 1.356, $P < .001$) than in the reference year (2012–2013).

Discussion

To our knowledge, this is a first study demonstrating rehabilitation therapy use among long-stay nursing home decedent residents. Consistent with existing reports of increase in therapy use in nursing homes, our findings show a similar trend occurring at the end of life. During the study period, rehabilitative therapy use in the last month of life increased by at least 20%, and the use of ultrahigh therapy intensity increased by 65%. Therapy use varied substantially across nursing homes, ranging from none to 45% of all decedent residents. This suggests there are substantial differences in both practice and policy with regard to the use of rehabilitation therapy across nursing homes. Indeed, we found that decedent residents in for-profit facilities had a greatly increased risk of receiving any therapy, and in particular high-to-ultrahigh therapy intensity, in the last 30 days of life. We also found that residents in chain facilities had a significantly higher probability of receiving low-to-medium therapy at the EOL. Furthermore, nursing homes with higher availability of physical therapists were substantially more likely to provide high-to-ultrahigh therapy levels to their long-stay decedent residents.

Our findings suggest that financial considerations may contribute to, if not directly drive, the receipt of EOL rehabilitation therapy. It is worth noting that among decedents receiving therapy in the last month of life, 60% were hospitalized within prior 2 months, compared with 24% among those who did not receive therapy prior to death. Numerous studies have

shown that nursing homes have an incentive to hospitalize their patients, particularly those on Medicaid, as would be the case with most long-stay residents.^{22,23} When these residents return to their nursing home, rehabilitation becomes a focal point for their care, as staff may be unable to recognize the futility of continuing curative/restorative treatment. Indeed, our finding that in facilities with lower nurse staffing, the probability of high-to-ultrahigh therapy intensity was higher may be consistent with the general lack of clinical knowledge and experience in recognizing that a resident is nearing EOL. However, as Travis and colleagues pointed out in their study of obstacles to palliation in nursing homes, only 17% of the cases they reviewed could be attributed to inability to recognize treatment futility.²⁴ By far a more prevalent obstacle appeared to be staff inability to agree on the most appropriate “real time” course of care and its implementation.

When nearing the end of life, residents may experience a decline in overall health status, which may be amplified following a hospitalization. In some cases, therapy may be an appropriate intervention to address such changes. For instance, assessing mobility status or swallowing function and implementing the use of an assistive device for ambulation or of adaptive equipment to facilitate self-feeding may be reasonable interventions for residents with a declining clinical status. However the precise “dose” of therapy needed to accomplish these goals may be at low or intermediate intensity rather than high or ultrahigh. Staff need to carefully consider at what level therapy may be helpful to residents as they approach the end of life versus when the burden of such an intervention outweighs any perceived benefits and may actually contribute to suffering prior to death. It is important to identify the threshold at which therapy interventions are unlikely to enhance quality of life or reverse the natural course of decline associated with terminal illness. This may be difficult to accomplish when financial pressures introduce the risk of shifting the care team’s focus from one of high-quality palliative care at the end of life to one of escalating billable interventions with potentially uncertain benefit.

Several limitations are noted. First this study was based on experience in one, albeit very large, state. As state regulations, Medicaid nursing home reimbursement, staffing requirement, and regional practice patterns may affect the use of rehabilitation benefits, a national study to understand the potential impact of and variations in EOL therapy use would be an important contribution to future research. Second, because our study was based on administrative data, we were unable to determine the extent to which rehabilitative therapy provided at the EOL may have been beneficial or harmful to patients. Further research in this regard is needed.

In conclusion, this study raises concerns and questions regarding the scope and intensity of therapy provided to residents prior to death. If this is due to a failure of recognition that a resident is approaching EOL, then attention needs to be paid to enhancing the assessment skills of nursing home care teams, cross-discipline communication, and identification of residents with a high probability of dying, so as to allow care teams to align their practices with palliative care goals. If financial drivers are contributing to both the high utilization and observed variation in practice across facilities, then regulatory and policy interventions may become necessary. Much more needs to be learned regarding the optimal “dose” of therapy services in nursing homes when a resident is on a trajectory of functional loss,

taking into context the individual prognosis, symptom burden, endurance, and a realistic anticipated benefit from therapy in the relatively short time prior to death. It is possible that for this population “less may be more” with regard to rehabilitation therapy use. The current focus on maximizing the use of restorative therapies may inappropriately and inadvertently prevent or delay the provision of palliative care, including the opportunity for early referral to hospice care for EOL residents.

Supplementary Material

Refer to Web version on PubMed Central for supplementary material.

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Fig. 1.
Distribution of therapy intensity by study year: received by long stay residents in the last month of life.

Fig. 2.
Percentage of long-stay residents receiving therapy in the last month of life: by day to death.

Table 1

Characteristics of Long-Stay Decedents by Receipt of Rehabilitative Therapy in the Last Month of Life: All Data Years Combined (10/1/2012–4/30/2016)

	No Therapy, % or M (SD) N = 48,091 (86.35%)	Therapy, % or M (SD) N = 7600 (13.65%)	P Value
Patient characteristics			
Marital status			
Married	19.59	19.17	.3874
Gender			
Female	69.87	64.00	<.0001
Race			
White	81.80	79.07	<.0001
Black	10.00	11.39	
Other	8.20	9.54	
Patient clinical characteristics			
Cancer	9.77	11.28	<.0001
Cardiovascular	93.19	96.04	<.0001
Diabetes	32.49	36.84	<.0001
Gastrointestinal	31.05	36.13	<.0001
Genitourinary	22.02	28.16	<.0001
Infections	38.29	56.80	<.0001
Malnutrition	4.63	4.47	.5544
Musculoskeletal	42.36	47.05	<.0001
Neurologic	85.82	83.47	<.0010
Other endocrine	55.38	62.86	<.0001
Psychiatric	67.77	70.59	<.0010
Pulmonary	30.16	36.75	<.0001
Vision	24.31	26.91	<.0001
Cognitive function			
Intact	11.49	12.3	<.0001
Mildly impaired	14.13	16.11	
Moderately impaired	36.06	36.91	
Severely impaired	34.24	28.84	
Hospitalized in the last 2 mo	24.57	60.01	<.0001
ADL score	22.25 (4.72)	22.21 (4.34)	.4618
Age at death	87.37 (9.41)	86.55 (9.23)	<.0001
Facility characteristics			
For profit	44.13	57.12	<.0001
Chain	12.86	12.14	.0266
Urban	96.49	97.46	<.0001
CNA hours/resident/d	2.41 (0.40)	2.37 (0.40)	<.0001
LPN hours/resident/d	0.85 (0.30)	0.85 (0.29)	.1793

	No Therapy, % or M (SD)	Therapy, % or M (SD)	P Value
	N = 48,091 (86.35%)	N = 7600 (13.65%)	
RN hours/resident/d	0.65 (0.22)	0.63 (0.22)	<.0001
PT hours/resident/d	0.09 (0.05)	0.09 (0.05)	.0004
Occupancy rate (1–100%)	92.10 (7.07)	92.00 (6.54)	.2685
% Medicaid residents	66.30 (14.28)	67.46 (13.41)	<.0001
% Medicare residents	11.68 (8.13)	12.50 (8.12)	<.0001

CNA, certified nurse assistant; LPN, licensed practical nurse; M, mean; PT, physical therapy; RN, registered nurse; SD, standard deviation.

Table 2

The Probability of Receiving Rehabilitation Therapy in the Last Month of Life: Facility Characteristics by Therapy Intensity

Facility and Trend Characteristics	No Therapy in the Last Month of Life (Reference Group)					
	Low/Medium Therapy			High/Ultrahigh Therapy		
	RRR	SE	P Value	RRR	SE	P Value
Profit	1.182	0.048	<.001	2.126 **	0.091	<.001
Chain	1.224	0.067	.003	1.045	0.132	.740
RN hours/resident/d	0.855	0.122	.206	0.525 **	0.222	.004
LPN hours/resident/d	1.292	0.089	.004	0.570 **	0.169	.001
CNA hours/resident/d	0.896	0.067	.100	1.175 *	0.125	.109
Physical therapy hours/resident/d	1.388	0.511	.521	16.180 **	0.908	.002
Occupancy rate	1.001	0.003	.764	0.995	0.006	.355
% Medicaid residents	1.001	0.002	.563	1.014 **	0.004	<.001
% Medicare residents	1.000	0.003	.985	1.030 **	0.006	<.001
Urban location	1.559	0.219	.042	1.843	0.423	.149
Year 2	0.862	0.044	.001	0.879	0.062	.040
Year 3	1.018	0.044	.688	1.101	0.061	.118
Year 4	0.995	0.052	.925	1.356 **	0.069	<.001

CNA, certified nurse assistant; LPN, licensed practical nurse; RN, registered nurse; SE, standard error.

**
P < .0001 and

*
P < .01 indicate significance levels in comparing RRRs between low/medium and high/ultrahigh therapy.