Feature Articles

Identifying potential long-stay residents in veterans health administration nursing homes

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ABSTRACT

Veterans Affairs nursing homes (Community Living Centers; CLCs) have largely shifted focus to providing short-term rehabilitative care, preferring longer-term care to be provided in contract nursing homes or at home. The goal of this retrospective cohort study is to identify resident characteristics associated with longer length of stay using the CLC Minimum Data Set ($n = 35,114$). Length of stay was defined as three groups: short (<90 days), moderate (91−365 days), and long (beyond 365 days). Residents who remained beyond 90 days were more likely to be black and to have a diagnosis of Alzheimer's disease, dementia, or schizophrenia, lived in another facility prior to admission, had a financial power of attorney, and had greater dependence in activities of daily living. Unique predictors of those who remained beyond 365 days were older age, cancer diagnosis, cognitive impairment, and admission from assisted living. Our findings can help CLC staff with admission decisions.

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Introduction

More than 45% of current Veterans Health Administration (VHA) users are over the age of 65 and the number of users over age 85 is expected to grow to more than 1.2 million by 2034.[1,2] With the growing number of older Veterans, the demand for long-term care services also will rise. Community Living Centers (CLCs; VHA nursing homes) provide care to more than 13,000 Veterans at a cost of more than $8 billion per year.[3] As VHA continues working to provide accessible Veteran-centered care, it is critical to maximize resource allocation. CLCs have been directed to rebalance the provision of long-term care by changing the focus from long-term nursing home care to short-stays devoted to rehabilitating and discharging the Veteran to the community within 90 days.[4] This directive mirrors the national trend towards reducing nursing home length of stay in favor of providing long-term services and supports in the community.

However, if an older adult experiences declines in function, living in the community is not always possible or appropriate.[5] According to the ecological theory of aging[6], older adults may be at risk for poor outcomes when the demands and resources available in the living environment are no longer in balance with the individual's needs and abilities ("everyday competence"[7]). The match between the living environment and an individual's everyday competence is known as person-environment fit. Poor person-environment fit resulting from low everyday competence and a lack of environmental support can put an older adult at risk for long-term care placement or other negative outcomes.[6] Often, a crisis (e.g., acute hospital stay or loss of a caregiver) precipitates transitions into long-term care settings. The focus on identifying an immediate solution to the crisis situation can preclude considerations of how the individual's everyday competence may change in the future, thus not exploring all available options for receiving long-term care services and supports. Consequently, these individuals may be placed in settings that do not maximize person-environment fit.

Several studies have examined characteristics of nursing home residents who should be targeted for community discharge in the general population, but this currently is not well known in the CLC population. However, the focus should not be on targeting residents for discharge once they are in a nursing home setting. Instead, more effort should be made to ensure that these older adults are in the most appropriate care setting from the start. Characteristics of residents who are more likely to become long-stayers in community nursing homes are: unmarried[8–10], older age[8,10,11]; admitted with cancer[8], hip fracture[11], diabetes[8], or end-stage disease[8]; Medicaid pay source[8]; cognitive impairment[8–11]; ADL dependence[8,10,11]; and low-care requirements[8].

Although VHA does not face the same disincentives as community nursing homes to discharging residents, the allocation of scarce

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resources (i.e., CLC beds) is a challenge in VHA. Despite considerable demographic, economic, and policy changes, no studies have examined the characteristics of long-stay residents in CLCs. Identifying residents before admission that could be diverted to a more appropriate environment, whether that is the CLC, a long-stay nursing home, assisted living, or home with the right mix of services and supports, should be a top priority. In an effort to identify these characteristics that predict long-stay, we examined resident factors associated with different CLC lengths of stay.

Methods

Study sample

For this retrospective cohort study, a MDS 2.0 analysis file was created that included all admissions ($n = 45,192$) to VA CLCs from January 1, 2009 to June 30, 2012. The CLCs began the migration to MDS version 3.0 in June of 2012 and this is the most recent data available for analysis at the time of this study. Residents with no assessments beyond an admission assessment were excluded ($n = 58$). We also excluded residents who died within one year of admission to the CLC ($n = 10,020$). The resulting analysis file contained records for 35,113 CLC residents. The cohort was followed from admission to the point of discharge to another residential setting or for a maximum of 365 days after admission.

Variables

Study variables were obtained from MDS Resident Assessment Instrument (RAI) admission, quarterly, significant change, and annual assessments, with data taken from the most recent assessment prior to discharge or the end of the study period for those who were not discharged. Variables of interest were chosen based on our examination of relevant literature[8−11] and the clinical judgment of our team. Discharge was categorized into three groups: short stay (discharged within 90 days of admission), moderate stay (discharged between 91 and 365 days of admission), and long-stay (not discharged within 365 days). The primary goal for this study was to determine characteristics of residents who became long-stay residents compared to those who had short and moderate lengths of stay.

From the MDS, we also determined discharge destination, which was collapsed into three categories: community (private home or apartment with no home health services, private home or apartment with home health services, or board and care/assisted living), community nursing home (nursing facility), other (acute care hospital, psychiatric hospital, MR/DD facility, rehabilitation hospital, other facility, or other), and not discharged (no discharge destination identified within 365 days of admission to CLC). To ensure that short-term discharges (e.g., a hospital stay) did not preclude the identification of community discharges later during the one-year examination period, we first chose community discharges, then community nursing home discharges, and finally discharges to other settings.

Resident demographic and characteristic variables of interest included age, sex, race (American Indian/Alaskan Native, Asian/Pacific Islander, Black, not of Hispanic origin, Hispanic, White, not of Hispanic origin, or unknown), marital status (never married, married, widowed, separated, divorced, or unknown), education, history of mental health or developmental disorders, legal guardianship or oversight, cognitive impairment, and diagnoses of renal failure, cancer, Alzheimer's disease, dementia, schizophrenia, bipolar disorder, depression, and/or anxiety. Cognitive impairment was measured using the Cognitive Performance scale (CPS), which indicates a range of scores from 0 (intact) to 6 (very seriously impaired).[12] Variables related to discharge preferences included resident lived alone before admission, lived in a facility previously, prefers community discharge, and has support for community

discharge. Place of residence at the time of admission to the CLC was also examined (e.g., private home, acute care hospital, assisted living). The Activities of Daily Living (ADL) long-form index was used to measure dependency in ADLs with a range of 0 (independent) to 28 (totally dependent).[13] To measure acuity, residents were group into RUG-III categories based on health conditions and/or service use: Extensive Services, Rehabilitation, Special Care, and Clinically Complex.[14] Using these RUG-III classifications, we identified residents with low-care requirements using the "broad" definition described by Mor et al. [15] Residents were considered to have low-care requirements if they did not fall into the Special Care or Clinically Complex RUG-III classifications and did not require assistance with mobility, transfer, toileting, and eating. The Changes in Health, End-stage disease, and Symptoms and Signs (CHESS)[16] scale measures health stability and risk for significant decline. CHESS is calculated based on presence of specific symptoms, end-stage disease, cognitive decline, or ADL impairment with scores ranging from 0 (no health instability) to 5 (very high health instability).

Analysis

Descriptive statistics, including frequency distribution, mean, and standard deviation for the variables of interest, were calculated for the overall sample and by each discharge group. Univariate analyses were performed using Chi-square test for categorical variables and t-test for continuous variables to evaluate the association between characteristics of residents and the timeframe of their discharge from the CLC: (1) short vs. moderate and long stay and (2) moderate vs. long stay. Variables significantly associated to discharge timeframe with $p < .001$ for either comparison were included in multivariable analyses. Generalized linear mixed model analyses were performed using these variables to identify characteristics that contribute to time of discharge to the community during our study period. Considering the difference among facilities, facility was modeled as a random effect. Two models were constructed to identify (1) characteristics associated with residents who were categorized as short-stay vs. those with moderate-and long-stay, and (2) moderate-stay vs. long-stay. Stepwise procedures were applied during variable selection. Variables with $p < .05$ in at least one of the two multivariate models were included in the final models.

Results

Resident characteristics

Out of the overall sample of 35,113 CLC residents, 77.6% ($n = 27,230$) were in the short-stay group, 15.9% ($n = 5574$) were in the moderate-stay group, and 6.6% ($n = 2309$) were in the long-stay group. CLC residents included in the analyses tended to be male, not married, white, educated at a high school level, and had an average age of 69 years (Table 1). The vast majority (90.4%) preferred to be discharged to the community and 80.3% had support for this type of discharge, resulting in 78% of residents both preferring and having support for discharge to the community. Among residents who were discharged from the CLC, most (77%) were discharged to the community (Table 2). Nearly 43% of CLC residents fell into the RUG Rehabilitation category. Residents had an average of 9 ADL impairments and a CHESS score of 2.23, which indicates relatively stable health. We found that 17.8% of the residents in this study had low care requirements based on the "broad" definition described above (Table 3).

Risk factors for becoming a long-stay CLC resident

The results of the generalized linear mixed model to examine factors associated with residents discharged within 90 days of admission (short-stay group) versus those who were not discharged within

Table 1
CLC resident demographics and characteristics by discharge status group.

	Overall n = 35,113	<90 days n = 27,230	91−365 days n = 5574	Not discharged n = 2309	<90 days vs. >90 days p	91−365 days vs. not discharged p
Age (mean and SD)	68.89 (12.6)	68.59 (12.6)	68.09 (12.1)	74.22 (12.1)	<.0001	<.0001
Female	1229 (3.5%)	993 (3.6%)	167 (3.0%)	69 (3.0%)	.005	.985
White, non-Hispanic	26,841 (76.4%)	21,105 (77.5%)	4009 (71.9%)	1728 (74.8%)	<.0001	.005
Married	12,937 (36.8%)	10,256 (37.7%)	1746 (31.3%)	389 (16.8%)	<.0001	<.0001
Education					<.0001	<.0001
Less than high school	5613 (16.0%)	4339 (15.9%)	879 (15.8%)	395 (17.1%)		
High school	15,966 (45.5%)	12,295 (45.2%)	2645 (47.5%)	1026 (44.4%)		
Technical/trade school	1886 (5.4%)	1518 (5.6%)	253 (4.5%)	115 (5.0%)		
Some college	7330 (20.9%)	5739 (21.1%)	1153 (20.7%)	438 (19.0%)		
Bachelor's degree	2654 (7.6%)	2053 (7.5%)	416 (7.5%)	185 (8.0%)		
Graduate school	1026 (2.9%)	763 (2.8%)	153 (2.7%)	110 (4.8%)		
History of mental health or developmental disorder	9425 (26.8%)	7021 (25.8%)	1606 (28.8%)	50 (2.2%)	<.0001	<.0001
Legal guardian, oversight	804 (2.3%)	486 (1.8%)	179 (3.2%)	139 (6.0%)	<.0001	<.0001
Financial power of Attorney	1495 (4.3%)	899 (3.3%)	266 (4.8%)	330 (14.3%)	<.0001	<.0001
Cognitive Performance Scale (moderate to severe)	5572 (15.9%)	3603 (13.2%)	1126 (20.2%)	843 (36.5%)	<.0001	<.0001
Renal failure	2989 (8.5%)	2,2236 (8.2%)	539 (9.7%)	214 (9.3%)	.0002	.5807
Cancer	6195 (17.6%)	4907 (18.0%)	879 (15.8%)	409 (17.7%)	.0006	.0337
Alzheimer's, dementia	5317 (15.1%)	3377 (12.4%)	966 (17.3%)	974 (42.2%)	<.0001	<.0001
Schizophrenia, bipolar	3377 (9.6%)	2397 (8.8%)	608 (10.9%)	372 (16.1%)	<.0001	<.0001
Depression, anxiety	14,603 (41.6%)	11,153 (41.0%)	2373 (42.6%)	1077 (46.6%)	.0010	.0020

SD=standard deviation

Table 2
Characteristics of discharge preferences and outcomes by discharge status group.

Discharge characteristics, n (%)	Overall n = 35,113	< 90 days n = 27,230	91−365 days n = 5574	Not discharged n = 2309	<90 days vs. >90 days p	91−365 days vs. not discharged p
Lived alone before admission	12,265 (34.9%)	9553 (35.1%)	2133 (38.3%)	579 (25.1%)	<.0001	<.0001
Has lived in "other" facility before admission	1750 (5.0%)	1103 (4.1%)	368 (6.6%)	279 (12.1%)	<.0001	<.0001
Admitted from hospital	25,273 (72.0%)	19,973 (73.4%)	4087 (73.3%)	1213 (52.5%)	<.0001	<.0001
Admitted from assisted living	1659 (4.7%)	358 (1.3%)	104 (1.9%)	120 (5.2%)	<.0001	<.0001
Admitted from private home	7141 (20.3%)	4177 (15.3%)	625 (11.2%)	306 (13.3%)	<.0001	<.0001
Prefers community discharge	31,749 (90.4%)	25,840 (94.9%)	4719 (84.7%)	1190 (51.5%)	<.0001	<.0001
Has support for community discharge	28,190 (80.3%)	23,329 (85.7%)	3934 (70.6%)	927 (40.1%)	<.0001	<.0001
Prefers and has support for community discharge	27,380 (78.0%)	22,811 (83.8%)	3762 (67.5%)	807 (35.0%)	<.0001	<.0001
Discharge disposition					<.0001	<.0001
Community	27,028 (77.0%)	23,296 (85.6%)	3671 (65.9%)			
Community nursing home	3200 (9.1%)	2168 (8.0%)	1007 (18.1%)			
Other setting	2751 (7.8%)	1767 (6.5%)	896 (16.1%)			

Table 3
CLC resident acuity and complexity by discharge status group.

Resident characteristics, n (%)	Overall n = 35,113	< 90 days n = 27,230	91−365 days n = 5574	Not discharged n = 2309	<90 days vs. >90 days p	91−365 days vs. not discharged p
ADL scale-long (mean and SD)	9.03 (7.7)	8.35 (7.4)	10.71 (8.2)	12.93 (8.5)	<.0001	<.0001
RUG extensive	2953 (8.4%)	2187 (8.0%)	588 (10.5%)	178 (7.7%)	<.0001	<.0001
RUG rehabilitation	15,009 (42.7%)	12,586 (46.2%)	1928 (34.6%)	495 (21.4%)	<.0001	<.0001
RUG special	5809 (16.50%)	4547 (16.7%)	975 (17.5%)	287 (12.4%)	<.0001	<.0001
RUG clinically complex	8341 (23.80%)	5896 (21.7%)	1531 (27.5%)	914 (39.6%)	<.0001	<.0001
RUG impaired cognition	742 (2.10%)	451 (1.7%)	130 (2.3%)	161 (7.0%)	<.0001	<.0001
RUG behavioral	111 (0.30%)	71 (0.3%)	20 (0.4%)	20 (0.9%)	<.0001	<.0001
RUG physical	2148 (6.10%)	1492 (5.5%)	402 (7.2%)	254 (11.0%)	<.0001	<.0001
Low care requirements- broad	6265 (17.8%)	5328 (19.6%)	692 (12.4%)	245 (10.6%)	<.0001	.0243
CHESS score (mean and SD)	2.23 (1.23)	2.21 (1.23)	2.23 (1.25)	2.42 (1.27)	.0001	<.0001

ADL=activities of daily living; SD=standard deviation; RUG=Resource Utilization Group; CHESS= Changes in Health, End-stage disease, and Symptoms and Signs

Table 4
Multivariate mixed model examining characteristics of residents who stayed beyond 90 days and residents who stayed beyond one year in the CLC.

	<90 days vs. >90 days			91–365 days vs. >365 days		
	O.R.	95% C.I.	P value	O.R.	95% C.I.	P value
Age	1.00	0.99–1.00	.009	1.03	1.02–1.03	<.001
Race (reference= white, non-Hispanic)						
Black	1.10	1.01–1.19	.011	1.14	0.97–1.33	.048
Hispanic	1.24	1.04–1.47		0.79	0.56–1.11	
Other race	1.12	0.94–1.33		0.74	0.51–1.06	
Marital status (reference = married)	0.88	0.82–0.94	<.001	1.11	0.97–1.27	.134
Mental health history	1.02	0.95–1.10	.696	1.17	1.01–1.35	.042
Power of attorney (financial)	1.37	1.20–1.56	<.001	1.48	1.20–1.82	<.001
Cognitive impairment (CPS)	1.02	1.00–1.05	.110	1.07	1.02–1.11	.004
Renal failure	1.28	1.16–1.42	<.001	1.08	0.89–1.32	.442
Cancer	0.97	0.90–1.05	.424	1.24	1.07–1.45	.006
Alzheimer's or dementia diagnosis	1.27	1.16–1.39	<.001	1.43	1.22–1.67	<.001
Schizophrenia	1.13	1.00–1.28	.045	1.79	1.46–2.21	<.001
Depression	1.11	1.04–1.18	.002	1.10	0.97–1.25	.138
Activities of daily living (long)	1.06	1.05–1.10	<.001	1.03	1.02–1.03	<.001
Lived alone before admission (reference= yes)	1.15	1.08–1.24	<.001	0.91	0.79–1.05	.001
Has lived in "other" facility before admission	1.26	1.15–1.38	<.001	1.17	1.00–1.37	.052
Prefers and has support for community discharge	0.38	0.36–0.41	<.001	0.49	0.43–0.56	<.001
Admitted from hospital	0.67	0.57–0.77	<.001	0.86	0.67–1.10	.230
Admitted from assisted living	1.04	0.87–1.25	.64	1.48	1.12–1.97	.007
Admitted from private home	0.45	0.38–0.53	<.001	1.04	0.79–1.36	.776
RUG rehabilitation	0.63	0.58–0.68	<.001	0.71	0.60–0.82	<.001
RUG extensive	0.79	0.70–0.88	<.001	0.74	0.59–0.93	.011
RUG special	0.87	0.80–0.95	.003	0.76	0.63–0.91	.003

RUG=Resource Utilization Group

90 days of admission (moderate- and long-stay groups) are presented in Table 4. Taking variation among facilities into consideration, Veterans were more likely to become moderate- or long-stay residents if they were of Black, Hispanic, or other race, had a financial power of attorney in place, and had diagnoses of renal failure, Alzheimer's disease or dementia, schizophrenia, and depression. These residents were more likely to have lived alone or in "other" facility prior to admission and had greater ADL impairments. Residents who were married, had support for and preferred community discharge, were admitted from a hospital or private home, and were designated as RUG Rehabilitation, Extensive, or Special (i.e., relatively less clinically complex) were less likely to remain in the CLC beyond 90 days.

A hierarchical logistic regression of factors associated with patients discharged between 91–365 days of admission (moderate-stay) vs. those who were not discharged within 365 days of admission (long-stay) revealed additional factors associated with remaining in the CLC beyond one year (Table 4). Similar to the residents who stayed beyond 90 days, those who remained in the CLC for longer than 365 days were more likely to be older, have a financial power of attorney in place, have greater cognitive impairment, and to have a diagnosis of cancer, Alzheimer's disease or dementia, and schizophrenia. Beyond those variables, long-stay residents were also more likely to have lived in assisted living prior to admission and had higher ADL impairment. Residents who lived with others prior to admission, had support for and preferred community discharge, and fell into the RUG classifications of Rehabilitation, Extensive, or Special (i.e., relatively less clinically complex) were less likely to remain in the CLC for more than 365 days.

Discussion

Similar studies in community nursing homes have typically focused on identifying residents to target for community discharge. These findings were largely comparable to those identified in our VHA sample. Although the populations are different, the similarities in these findings among the studies are not surprising given that, ultimately, the factors identified in both studies are essentially markers of poor person-environment fit. Thomas et al.[17] recently found that,

although the proportion of CLC residents transitioning to the community has improved over time, there was not a reduction in length of stay for both long- and short-stays. With these mixed findings, it is clear there is still room for improvement in meeting VHA's objective of rebalancing long-term care. In this study, characteristics associated with becoming a moderate- to long-stay resident were related to demographics, psychosocial issues, and clinical complexity. Although not all of these factors are ameliorable within the CLC or elsewhere, additional steps maybe taken in many cases to improve the likelihood and success of transitions to the community or to divert the individual to a more appropriate care setting. VHA has invested significant effort in creating a variety of long-term services and supports for Veterans, including the Medical Foster Home program, contract nursing homes, telemedicine and telehealth programs, and community-based care options.

The factors identified in this study are important for identifying residents who are at-risk for poor person-environment fit in the CLC, but not sufficient for determining a more appropriate care environment. Everyday competence (i.e., an individual's needs and abilities) is an essential component of maximizing person-environment fit, but it is not included in studies on transitioning residents from nursing homes to the community and is not part of standard assessments conducted in nursing homes. Traditional nursing home assessments tend to focus solely on cognitive function and exclude assessment of executive function (e.g., the problem-solving and decision-making), which is a critical component of everyday competence. Everyday competence should be considered when deciding whether to accept a resident into the CLC and during care planning for transitions to the community to maximize person-environment fit and resident outcomes.[18] In previous work, our team has developed a brief tool for evaluating everyday competence that can be used by any nursing home staff member.[19]

The findings from this study are limited by our reliance on VHA MDS data. In addition to everyday competence, there are many non-medical factors that may contribute to long-stay status that are not included in the variables assessed by the MDS. For instance, sex offender registration, felony conviction, and lack of community long-term services and supports options may leave the CLC as the only

option for residents. Furthermore, Veterans who have experienced chronic homelessness, instability, and loneliness may become resistant to leaving the CLC because it provides a home-like environment and the opportunity for camaraderie with other Veterans. When considering our findings in the context of person-environment fit, the VHA MDS data also limits what we know about the environments involved. Including additional data on the characteristics of the built environment (e.g., measurements and locations of structures, services and resources available within walking distance, etc.) would benefit future examinations of whether an older adult is in an environment that matches well with their capabilities. A large sample was used for our analyses. Given the large number of variables used (both for calculating composite scores and in the multivariate analyses) and the variation in size among the groups (the smallest only having 2309 residents), we felt the large sample size was necessary. It is possible that, with high power to detect differences, some findings may be statistically significant, but are not clinically meaningful. The next steps for this work should include the incorporation of additional VHA administrative data sets and primary data to develop and test a more comprehensive and clinically relevant screening tool of Veterans at risk for long-stay in the CLC.

Conclusion

Compared with community nursing homes, VHA CLCs serve residents that are different in many ways. However, the findings from this study indicate that the factors associated with becoming a long-stay resident in CLCs are very similar to those in community nursing homes. Thus, it is likely that CLC residents could benefit from transition programs similar to those employed in the community, such as Money Follows the Person.[20] Future work in this area should also focus on the development of brief screening tools to identify potential residents with poor CLC person-environment fit and divert those individuals to more appropriate care environments. As VHA faces an increasing number of Veterans who may require CLC-based care, it is critical that older Veterans have the opportunity to receive care in the least-restrictive environment that matches their needs and preferences.

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Competing interests statement

The authors have no competing interests to declare.

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