

ORIGINAL ARTICLE

Antipsychotic initiation and new diagnoses excluded from quality-measure reporting among Veterans in community nursing homes contracted by the Veterans Health Administration in the United States

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Abstract

Objectives: To assess whether prevailing antipsychotic use rates in community nursing homes (CNH) influence new initiation of antipsychotics and diagnosis with antipsychotic indications among Veterans.

Methods: We used linked 2013–2016 Veterans Administration (VA) data, Medicare claims, Nursing Home Compare, and Minimum Data Set (MDS) assessments. The exposure was the proportion (in quintiles) of all CNH residents prescribed antipsychotics in the quarter preceding a Veteran's admission date. Using adjusted logistic regression, we analyzed two outcomes measured using MDS: antipsychotic initiation, and new diagnosis of an antipsychotic quality-measure exclusionary condition (i.e., schizophrenia, Tourette's syndrome, or Huntington's disease).

Results: Among 8201 Veterans without an indication for antipsychotics at baseline, 21.1% initiated antipsychotics and 3.5% were newly diagnosed with any exclusionary diagnosis after CNH admission. Schizophrenia accounted for almost all (96.8%) the new diagnoses. Antipsychotic initiation increased with higher CNH antipsychotic use rates: OR = 2.55, 95% CI: 2.08--3.12, quintile 5 versus 1. CNHs with the highest prevalent use of antipsychotics were associated with increased odds of Veterans acquiring an exclusionary diagnosis (OR = 2.09, 95% CI: 1.32--3.32, quintile 5 vs. 1).

Conclusions: Incident antipsychotic use is common among Veterans admitted to CNHs. CNH antipsychotic prescribing practices are associated with Veterans being newly diagnosed with antipsychotic prescription indications, primarily schizophrenia.

KEYWORDS

antipsychotic prescribing, nursing home, VA purchased care, veteran

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1 | INTRODUCTION

In the United States, the Veterans Health Administration (VA) faces a growing demand for long-term care among Veterans (Kinosian et al., 2007; Thomas et al., 2018). To help meet this need, VA contracts with non-VA providers allowing eligible Veterans to receive VA-financed care in privately owned community nursing homes hereafter referred to as CNHs (Intrator et al., 2020; Miller et al., 2015). VA purchasing of long-term care could expand amid reforms intended to increase Veterans' access to community providers (Kupfer et al., 2018; Veterans Access, Choice, and Accountability Act, 2014) creating a need to better understand the quality of VA-purchased nursing home care.

Despite antipsychotic medications being associated with serious adverse effects, including stroke and mortality (Maust et al., 2015; Randle et al., 2019; Schneider et al., 2005; Weintraub et al., 2016, 2017), their off-label prescribing (use for which there is no clinical indication) is common (Jeste et al., 2008; Kolanowski et al., 2006). A 2011 report estimated that 83% of Medicare antipsychotic drug claims for older adults in nursing homes were off-label (Levinson, 2011). There have been major quality improvement initiatives to reduce antipsychotic prescribing in nursing homes, including the 2012 launch of the National Partnership to Improve Dementia Care by Centers for Medicare and Medicaid Services (CMS) (Carnahan et al., 2017; Crystal et al., 2020; Lucas & Bowblis, 2017). From 2011Q4 to 2018Q4, antipsychotic use decreased from a national average of 23.9%–14.6% among long-stay nursing home residents, excluding those diagnosed with schizophrenia, Huntington's disease or Tourette's syndrome (Partnership, 2019).

Prior studies suggest that characteristics often associated with higher antipsychotic use in nursing homes are related to fewer resources and limited funding. Having a greater proportion of Medicaid-insured residents, for instance, has been associated with increased nursing home antipsychotic use (Fashaw et al., 2020). Given that Medicaid reimbursement rates are lower than private-pay, Medicaid-reliant facilities may have less resources. Therefore, antipsychotics could be serving as a cost-saving alternative to investing in specialized training and more highly trained nursing staff. Meanwhile, other studies reported that NHs with mental health staff are more likely to prescribe antipsychotics (Bonner et al., 2015; Hughes et al., 2000; Lucas et al., 2014). This could be explained by a greater share of residents with behavioral problems in facilities where mental health staff are more available or to the practices of mental health professionals (Cioltan et al., 2017). Although extensive literature has evaluated antipsychotic use in nursing homes, there is both limited information and a lack of contemporary data about the use of antipsychotics by Veterans (Gellad et al., 2012; Leslie et al., 2009). Antipsychotic use among Veterans who reside in CNHs has not been systematically evaluated. As the use of VA-financed care from privately owned nursing homes is expected to increase, it is unknown whether community rates of antipsychotic prescribing are associated with antipsychotic use when Veterans are admitted to CNHs.

CNHs are typically subject to CMS quality performance monitoring and reimbursement incentives (Lucas & Bowblis, 2017) that could influence antipsychotic prescribing practices. Since the incentives are designed to penalize only off-label antipsychotic use, an unintended consequence of these programs may be that residents receive diagnoses of psychiatric conditions such as schizophrenia for which antipsychotics are indicated—conditions that, under usual circumstances, are rarely diagnosed in older adults (Statement, 2017). Our objectives are to assess the influence of prevalent rates of antipsychotic use in CNHs on the likelihood of individual-level antipsychotic initiation and receipt of a new diagnosis excluded from nursing home antipsychotic reporting to CMS. We hypothesize that antipsychotic-naïve Veterans admitted to CNHs with higher rates of prevalent antipsychotic use are significantly more likely to initiate antipsychotic therapy and be diagnosed with antipsychotic indications than Veterans at CNHs with lower prevalent rates of antipsychotic use.

2 | METHODS

2.1 | Study design and data sources

We conducted a retrospective study of VA-enrolled Veterans admitted to CNHs between 2013 and 2016. We used data from VA's Corporate Data Warehouse, including enrollment files, inpatient and outpatient encounters, and non-VA care in the community financed by VA. We used Medicare enrollment and claims to obtain additional data on Veterans' healthcare utilization. Assessments from CMS' Resident Assessment Instrument/Minimum Data Set (MDS) were linked to Veterans' CNH stays. All Veterans included in this analysis had MDS data. To identify measures of quality and nursing home characteristics we linked Medicare's Nursing Home Compare quarterly reports. Linkages of VA and Medicare healthcare databases were developed by the Veteran's Affairs Information Resource Center (VIREC), a resource center of the VA Health Services Research & Development. VIREC maintains a crosswalk file with at least one unique patient identifier (e.g., Social Security Number [SSN]) included in both datasets to facilitate exact linkages (Hynes et al., 2018; Zhu et al., 2009). Additionally, VIREC receives all MDS assessment data for VA enrolled Veterans and links the assessments to VA data using scrambled SSNs. VIREC makes linked VA, Medicare, and MDS data available to VA researchers with approved research protocols.

2.2 | Study sample

We analyzed data from Veterans with long stays at CNHs. We identified long-stay residents by the presence of an MDS assessment conducted around 100 days after the admission date. Stays were excluded if the Veteran had previously resided in a nursing home financed by Medicare or the VA in the prior 180 days, lacked a valid

residential zip code, lived outside the 50 states, or filled prescriptions for antipsychotic medications 6 months prior to CNH admission. Prescription fills were determined using VA pharmacy data and Medicare Part D drug claims where available. Similarly, we relied on a combination of VA and Medicare claims to identify clinical diagnoses at baseline. We deemed the lack of pharmacy fills or diagnostic codes of interest to indicate non-use of those medications and absence of those conditions over a specified look-back period. At baseline, defined as the 12 months before admission, we classified Veterans by whether they had been diagnosed with an indication for receipt of antipsychotics. We regarded schizophrenia, Tourette's syndrome, and Huntington's disease as indications because these conditions are excluded from antipsychotic quality measure reporting based on CMS Surveyor Guidance ("CMS"). Our main analysis focuses on Veterans without CMS indications for antipsychotic use at admission.

2.3 | Measures

2.3.1 | Exposure variable

We ensured that the antipsychotic exposure measure was determined in the period before a Veteran entered a CNH. The study exposure was the prevalent antipsychotic prescribing rate, which we obtained from Nursing Home Compare, measured at the nursing home level and during the quarter preceding an individual Veteran's admission date. We assigned each CNH to a quintile, with quintile 1 as the lowest level of antipsychotic prescribing and quintile 5 the highest.

2.3.2 | Outcome variables

We measured two outcomes using nursing home MDS clinical assessment data collected approximately 100 days after CNH admission: (1) new antipsychotic medication use, and (2) new diagnosis of schizophrenia, Tourette's syndrome, or Huntington's disease among those without an indication at baseline. The MDS items used in these outcome definitions were N0450A (antipsychotic medication review), I6000 (schizophrenia), I5250 (Huntington's disease), and I5350 (Tourette's syndrome).

2.3.3 | Covariates

Demographic characteristics of Veterans included age, sex, race, and ethnicity, marital status, and a service-connected disability that entitles the Veteran to VA-financed long-term care (i.e., priority level 1). A Veteran's home residence was determined to be rural if it was in a rural-urban commuting area with codes 8, 9, or 10. To control for Veteran access to a VA-operated community living center (CLC), we included an indicator if there was one located within 30 miles of their home. Medicare and Medicaid insurance coverage were derived from the Medicare enrollment file. Clinical characteristics included

hospitalization in the prior year, hospitalization immediately before CNH admission, and various physical and psychiatric comorbidities. All comorbidities were identified using ICD9/10 diagnosis codes in VA, community care financed by VA, and Medicare claims from the year prior to admission. We adjusted for hospice care during the CNH stay to account for potential antipsychotic use to treat terminal delirium. To avoid model overspecification we adjusted for limited nursing home characteristics including the overall star rating during the admission month and the number of other Veterans residing in the CNH at time admission.

2.3.4 | Antipsychotic prescribing ratio

We compared prevalent rates of antipsychotic prescribing among VA-contracted CNHs relative to all other community nursing homes in a VA Medical Center's (VAMC) local market. We first defined a set of potential CNHs in a Veteran's community based on the distance from the Veteran's home address. For non-rural Veterans, a nursing home was included if it was within 25 and 35 miles for rural Veterans. If there were fewer than 15 nursing homes within that radius, we added the nearest nursing home in terms of distance until the Veteran's choice set included at least 15 facilities. To be included in the Veteran's local market, the nursing home needed to be operating in the month of admission. We included the CNH where the Veteran was admitted in the choice set. After assignment at the Veteran level, the local market was aggregated to the VAMC level. There was no adjustment done for the size of VAMCs. The antipsychotic prescribing ratio for each VAMC market was calculated as the mean prevalent antipsychotic use rate in contracted nursing homes divided by the mean prevalent antipsychotic use among non-contracted nursing homes.

2.4 | Statistical analysis

We used a logit model to estimate a resident's probability of new antipsychotic prescription around 100 days after admission. We adjusted for the aforementioned covariates in the model with VAMC and year fixed effects. We estimated a separate model of the probability of being newly diagnosed with schizophrenia, Tourette's syndrome, or Huntington's disease after admission to the CNH.

2.5 | Secondary analysis

We additionally analyzed a sample of Veterans with an indication for antipsychotic use at baseline in order to contrast the extent of the association with incident antipsychotic use against that observed among Veterans without an indication at baseline. Because there were too few Veterans who were antipsychotic-naïve who were diagnosed with schizophrenia, Tourette's syndrome, and Huntington's disease at baseline ($n = 375$), we additionally included FDA-approved adult indications (bipolar disorder, bipolar depression,

TABLE 1 Characteristics of Veterans without exclusionary diagnoses (schizophrenia, Tourette's syndrome, and Huntington's disease) at admission to VA-contracted community nursing homes—overall and by quintile of prevalent rates of antipsychotic use

Characteristic, n (%)	Quintile 1	Quintile 2	Quintile 3	Quintile 4	Quintile 5	Total	p-value
CNH prevalent antipsychotic use rate	0%–10.9%	11.0%–14.7%	14.8%–19.2%	19.3%–25.6%	25.7%–91.4%	18.6% (SD 9.8%)	
Number of Veterans, N	1654	1654	1664	1638	1591	8201	
Age, years							
<55	27 (1.6)	31 (1.9)	32 (1.9)	32 (2.0)	40 (2.5)	162 (2.0)	<0.001
56–64	129 (7.8)	137 (8.3)	117 (7.0)	123 (7.5)	165 (10.4)	671 (8.2)	
65–74	558 (33.7)	503 (30.4)	518 (31.1)	539 (32.9)	551 (34.6)	2669 (32.5)	
75–84	310 (18.7)	336 (20.3)	351 (21.1)	320 (19.5)	323 (20.3)	1640 (20.0)	
85+	630 (38.1)	647 (39.1)	646 (38.8)	624 (38.1)	512 (32.2)	3059 (37.3)	
Male	1601 (96.8)	1607 (97.2)	1626 (97.7)	1593 (97.3)	1538 (96.7)	7965 (97.1)	0.40
Race and ethnicity							
White non-Hispanic	1185 (71.6)	1254 (75.8)	1281 (77.0)	1233 (75.3)	1156 (72.7)	6109 (74.5)	<0.001
Black	303 (18.3)	251 (15.2)	238 (14.3)	252 (15.4)	243 (15.3)	1287 (15.7)	
Hispanic	46 (2.8)	49 (3.0)	46 (2.8)	52 (3.2)	68 (4.3)	261 (3.2)	
Other	61 (3.7)	38 (2.3)	29 (1.7)	24 (1.5)	20 (1.3)	172 (2.1)	
Unknown	59 (3.6)	62 (3.7)	70 (4.2)	77 (4.7)	104 (6.5)	372 (4.5)	
Married	859 (51.9)	891 (53.9)	852 (51.2)	850 (51.9)	734 (46.1)	4186 (51.0)	<0.001
Priority group							
1 (service-connected disability > 50%)	1313 (79.4)	1322 (79.9)	1352 (81.3)	1355 (82.7)	1363 (85.7)	6705 (81.8)	<0.001
2–4 (other disabled)	131 (7.9)	131 (7.9)	139 (8.4)	120 (7.3)	111 (7.0)	632 (7.7)	
5–8 (no disability)	210 (12.7)	201 (12.2)	173 (10.4)	163 (10.0)	117 (7.4)	864 (10.5)	
Medicaid	49 (3.0)	47 (2.8)	58 (3.5)	56 (3.4)	52 (3.3)	262 (3.2)	0.79
Medicare	1046 (63.2)	1073 (64.9)	1166 (70.1)	1178 (71.9)	1231 (77.4)	5694 (69.4)	<0.001
Hospitalized in year prior to admission	1123 (67.9)	1130 (68.3)	1137 (68.3)	1118 (68.3)	1124 (70.6)	5632 (68.7)	0.45
Admitted from a hospital stay	1035 (62.6)	1050 (63.5)	1050 (63.1)	1050 (64.1)	1075 (67.6)	5260 (64.1)	0.027
CLC at home VAMC	441 (26.7)	413 (25.0)	388 (23.3)	288 (17.6)	284 (17.9)	1814 (22.1)	<0.001
Comorbidities							
Myocardial infarction	241 (14.6)	261 (15.8)	290 (17.4)	285 (17.4)	205 (12.9)	1282 (15.6)	<0.001
Peripheral vascular disease	627 (37.9)	638 (38.6)	620 (37.3)	639 (39.0)	567 (35.6)	3091 (37.7)	0.31
Dementia	602 (36.4)	620 (37.5)	624 (37.5)	683 (41.7)	661 (41.5)	3190 (38.9)	0.002
Chronic pulmonary disease	679 (41.1)	737 (44.6)	759 (45.6)	785 (47.9)	702 (44.1)	3662 (44.7)	0.002
Diabetes without complications	764 (46.2)	746 (45.1)	780 (46.9)	840 (51.3)	783 (49.2)	3913 (47.7)	0.003
Diabetes with complications	341 (20.6)	297 (18.0)	297 (17.8)	304 (18.6)	267 (16.8)	1506 (18.4)	0.067
Cancer	392 (23.7)	375 (22.7)	356 (21.4)	376 (23.0)	311 (19.5)	1810 (22.1)	0.041
Metastatic carcinoma	118 (7.1)	98 (5.9)	98 (5.9)	102 (6.2)	78 (4.9)	494 (6.0)	0.12
Post-traumatic stress disorder	223 (13.5)	208 (12.6)	221 (13.3)	218 (13.3)	203 (12.8)	1073 (13.1)	0.93
Substance use disorder	125 (7.6)	119 (7.2)	124 (7.5)	153 (9.3)	118 (7.4)	639 (7.8)	0.14
Major depressive disorder	755 (45.6)	770 (46.6)	795 (47.8)	815 (49.8)	790 (49.7)	3925 (47.9)	0.066
Bipolar disorder	82 (5.0%)	77 (4.7%)	109 (6.6%)	89 (5.4%)	150 (9.4%)	507 (6.2%)	<0.001
Hospice care during CNH stay	60 (3.6)	77 (4.7)	87 (5.2)	108 (6.6)	131 (8.2)	463 (5.7)	<0.001

TABLE 1 (Continued)

Characteristic, n (%)	Quintile 1	Quintile 2	Quintile 3	Quintile 4	Quintile 5	Total	p-value
Outcome measures							
Initiating antipsychotics	226 (12.7)	269 (15.3)	324 (18.5)	385 (22.2)	526 (31.8)	1730 (21.1)	<0.001
Acquiring indication ^a	40 (2.3)	28 (1.6)	51 (2.9)	51 (2.9)	113 (6.8)	283 (3.5)	<0.001

Abbreviations: CLC, community living center; CNH, community nursing home; SD, standard deviation; VAMC, VA medical center.

^aThe total diagnosed with schizophrenia was 274 and less than 10 were diagnosed with each of Tourette's syndrome and Huntington's disease.

TABLE 2 Characteristics of VA-contracted community nursing homes by quintiles of prevalent rates of antipsychotic use

Characteristic	Quintile 1	Quintile 2	Quintile 3	Quintile 4	Quintile 5	p-value
CNH prevalent antipsychotic use rate	0%–10.9%	11%–14.7%	14.8%–19.2%	19.3%–25.6%	25.7%–91.4%	
Maximum number of veterans, mean (SD)	10.3 (7.1)	9.9 (7.2)	9.5 (6.7)	9.9 (7.3)	11.1 (8.1)	<0.001
Distance to CNH from home residence (miles), mean (SD)	41.0 (228.7)	48.8 (327.7)	92.6 (328.1)	50.7 (315.8)	42.6 (340.8)	<0.001
Distance to CNH from VAMC, mean (SD)	39.7 (52.3)	37.5 (52.2)	40.4 (57.6)	37.9 (44.8)	39.8 (60.2)	0.50
Total beds, mean (SD)	128.2 (48.1)	140.7 (59.4)	137.8 (56.9)	148.7 (66.5)	147.0 (58.8)	<0.001
Part of a chain	930 (70.6%)	994 (69.4%)	1006 (70.0%)	959 (66.0%)	979 (61.6%)	<0.001
For profit	1119 (85.0%)	1125 (78.5%)	1130 (78.6%)	1174 (80.9%)	1413 (89.0%)	<0.001
Hospital based	14 (1.1%)	22 (1.5%)	25 (1.7%)	11 (0.8%)	4 (0.3%)	<0.001
% Medicaid residents, mean (SD)	55.9 (17.2)	59.4 (14.6)	60.4 (14.6)	62.4 (14.4)	66.6 (13.5)	<0.001
RN hours/Patient day, mean (SD)	0.5 (0.4)	0.5 (0.3)	0.5 (0.3)	0.5 (0.2)	0.4 (0.2)	<0.001
LPN hours/Patient day, mean (SD)	0.9 (0.4)	0.8 (0.3)	0.8 (0.3)	0.8 (0.3)	0.8 (0.3)	<0.001
CNA hours/Patient day, mean (SD)	2.4 (0.6)	2.3 (0.6)	2.3 (0.6)	2.2 (0.6)	2.2 (0.6)	<0.001
Share of RNs to all nurses, mean (SD)	0.4 (0.2)	0.4 (0.2)	0.4 (0.2)	0.4 (0.2)	0.3 (0.2)	<0.001
Average RUG, mean (SD)	1.2 (0.2)	1.2 (0.1)	1.2 (0.1)	1.2 (0.1)	1.1 (0.1)	<0.001
Overall star rating of CNH, mean (SD)	3.4 (1.3)	3.2 (1.3)	3.1 (1.4)	2.9 (1.3)	2.7 (1.3)	<0.001
Star survey rating of CNH, mean (SD)	2.9 (1.2)	2.7 (1.3)	2.7 (1.2)	2.6 (1.2)	2.5 (1.2)	<0.001
Star staffing rating of CNH, mean (SD)	3.2 (1.0)	3.2 (1.1)	3.1 (1.0)	3.0 (1.1)	2.8 (1.2)	<0.001
Star quality rating of CNH, mean (SD)	3.9 (1.1)	3.7 (1.2)	3.5 (1.3)	3.3 (1.4)	3.2 (1.4)	<0.001

Abbreviations: CAN, certified nursing assistant; CLC, community living center; CNH, community nursing home; LPN, licensed practical nurse; SD, standard deviation; RN, registered nurse; VAMC, VA medical center; RUG, resource utilization group.

schizoaffective disorder, major depressive disorder) to create a subgroup with indications at baseline based on a broad definition (Indications, 2015).

All analyses were performed using SAS Enterprise Guide 7.1 (SAS Institute Inc) and STATA 15. The study was approved by the Providence VAMC Institutional Review Board, and all data were acquired through data use agreements for VA and VA/CMS data provided by the Department of Veterans Affairs and VIREC.

3 | RESULTS

3.1 | Descriptive results

The final analytic sample in the main analysis comprised 8201 (77.9%) Veterans who were antipsychotic-naïve and had not been

diagnosed with schizophrenia, Tourette's syndrome, or Huntington's disease before CNH admission. Veterans were distributed across 1035 unique CNHs and had mean length of stay (standard deviation) of 324 (275) days. The prevalent rates of antipsychotic use at CNHs were 0%–10.9% (quintile 1), 11%–14.7% (quintile 2), 14.8%–19.2% (quintile 3), 19.3%–25.6% (quintile 4), and 25.7%–91.4% (quintile 5).

Overall, among Veterans without an antipsychotic indication at admission, 89.8% were at least 65 years of age, and 97.1% male. Non-Hispanic Whites accounted for 74.5% of Veterans; whereas 15.7% were Black, and 3.2% were Hispanic (Table 1). Demographically, Veterans tended to be younger and more likely to be Hispanic as the prevalent rate of antipsychotic use increased. The proportion of Veterans with a service-connected disability was higher with increasing prevalent antipsychotic rates as were the proportions enrolled in Medicare or hospitalized in the year prior to CNH admission. Veterans admitted to CNHs with high antipsychotic use

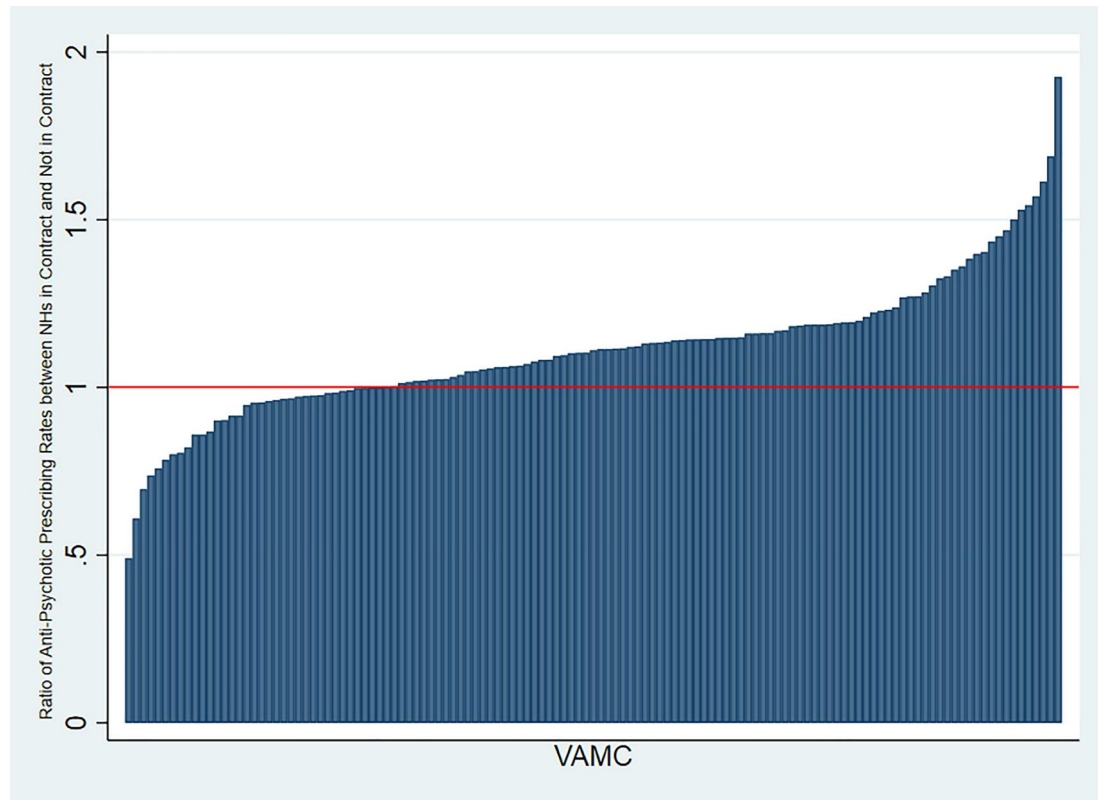


FIGURE 1 Ratio of prevalent antipsychotic prescribing rates between community nursing homes with versus without contracts with Veterans Administration (VA) medical centers. 72.4% of VA-contracted community nursing homes had prevalent rates of antipsychotic prescribing greater than those of non-contracted nursing homes available in local VA Medical Center markets

rates were less likely to have a home residence within 30 miles of a CLC: 26.7% in quintile 1 versus 17.9% in quintile 5. The distributions of comorbidities were similar across quintiles for many conditions except for myocardial infarction, dementia, chronic pulmonary disease, diabetes without complications, and cancer. These relationships were often nonlinear where they existed with exception of dementia which was generally more prevalent in CNHs with higher antipsychotic use rates.

On average, 21.1% of long-stay Veterans initiated antipsychotic medications after CNH admission. The proportion initiating antipsychotics increased across quintiles and ranged from 12.7% (quintile 1) to 31.8% (quintile 5). Overall, 3.5% ($n = 283$) of Veterans received a new diagnosis of schizophrenia, Tourette's syndrome, or Huntington's disease after CNH admission. There were 274 Veterans newly diagnosed with schizophrenia representing a vast majority (96.8%) of the new diagnoses that were identified. The proportion of Veterans acquiring new indications was comparable across CNHs in quintiles 1–4 (2.3%–2.9%) but markedly higher in quintile 5 at 6.8%.

At the nursing home level, CNHs with higher prevalent rates of antipsychotic use had more residents on Medicaid, fewer registered nurses, greater total beds, lower overall star rating, and a larger number of Veterans with VA-paid care than CNHs with lower antipsychotic use (Table 2). On average, 46 nursing homes were in a Veteran's choice set with 5 of those facilities under contract with VA. No VAMC had nursing home markets that were all under VA

contracts. There was considerable variation in the antipsychotic prescribing ratio across VAMC markets (Figure 1). Almost three-quarters (72.4%) of VAMC-contracted CNHs had greater prevalent antipsychotic rates than nursing homes VAMCs did not contract with.

3.2 | Regression results

While the odds of new antipsychotic use were similar for Veterans admitted to CNHs in quintiles 1 and 2; there were significantly greater odds of antipsychotic initiation at CNHs with middle-quintile or higher prevalence of antipsychotic use (Table 3). The magnitude of the association increased with higher quintiles, for instance, OR = 1.35, 95% CI: 1.10–1.66 for quintile 3 versus 1, OR = 1.81, 95% CI: 1.47–2.21 for quintile 4 versus 1, and OR = 2.55, 95% CI: 2.08–3.12 for quintile 5 versus 1. Veteran characteristics associated with antipsychotic initiation included older age, rural home residence, not having service-connected disability, prior year hospitalization, and diagnosis of dementia, post-traumatic stress disorder (PTSD), bipolar disorder, or depression. We found no association between star ratings or number of Veterans residing in a CNH with antipsychotic initiation. Additionally, we found that Veterans admitted to CNHs with the highest prevalent rate of antipsychotic use (quintile 5) were significantly more likely to acquire a new diagnosis of conditions that warrant treatment with antipsychotics: OR = 2.09, 95% CI: 1.32–3.32 (Table 4). History

TABLE 3 Adjusted association between prevalent rates of antipsychotic use in VA-contracted community nursing homes and new initiation of antipsychotics among Veterans without schizophrenia, Tourette's syndrome, and Huntington's disease at admission

	Odds ratio	95% confidence interval		p-value
Facility characteristics				
Antipsychotic prescribing quintile				
2 versus 1	1.22	1.00	1.51	0.055
3 versus 1	1.35	1.10	1.66	0.004
4 versus 1	1.81	1.47	2.21	<0.001
5 versus 1	2.55	2.08	3.12	<0.001
Overall star rating 1–3 versus 4–5	1.07	0.95	1.22	0.260
Number of veterans in CNH at admission				
0 versus 1–6	0.74	0.25	2.22	0.593
7–12 versus 1–6	0.84	0.28	2.53	0.762
13+ versus 1–6	0.80	0.27	2.39	0.684
Demographic characteristics				
Age				
55–64 versus <55	1.87	1.14	3.06	0.013
65–74 versus <55	1.69	1.06	2.70	0.027
75–84 versus <55	1.77	1.09	2.85	0.020
85+ versus <55	1.53	0.95	2.45	0.079
Male	0.81	0.58	1.12	0.213
Race and ethnicity				
Black versus White, non-Hispanic	0.84	0.69	1.01	0.064
Hispanic versus White, non-Hispanic	1.00	0.71	1.42	0.994
Other versus White, non-Hispanic	0.64	0.39	1.05	0.081
Unknown versus White, non-Hispanic	1.21	0.93	1.58	0.154
Married	0.87	0.77	0.98	0.019
Urban home residence	0.86	0.74	0.98	0.027
Clinical and other characteristics				
Priority group other versus 1	1.69	1.39	2.05	<0.001
Medicaid	1.17	0.85	1.63	0.332
Medicare	0.92	0.76	1.11	0.392
Hospitalization in year prior	0.80	0.64	1.00	0.047
Admitted from a hospital discharge	1.04	0.84	1.29	0.738
CLC at home VAMC	1.06	0.90	1.25	0.484
Comorbidities				
Myocardial infarction	0.85	0.72	1.02	0.070
Peripheral vascular disease	0.85	0.74	0.96	0.011
Dementia	2.18	1.92	2.49	<0.001
Chronic pulmonary disease	0.69	0.60	0.78	<0.001
Diabetes without complications	0.94	0.82	1.07	0.325
Diabetes with complications	0.62	0.52	0.74	<0.001

(Continues)

TABLE 3 (Continued)

	Odds ratio	95% confidence interval		p-value
Cancer	0.79	0.67	0.93	0.004
Metastatic cancer	1.14	0.86	1.50	0.363
Mental health comorbidities				
Post-traumatic stress disorder	1.28	1.08	1.52	0.005
Bipolar disorder	3.88	3.17	4.73	<0.001
Substance use disorder	1.00	0.81	1.25	0.951
Depression	1.33	1.17	1.52	<0.001
Hospice care during CNH stay	1.28	0.98	1.67	0.065

Abbreviations: CLC, community living center; CNH, community nursing home; VAMC, VA medical center.

of being diagnosed with bipolar disorder was strongly associated with acquiring a diagnosis of schizophrenia, Tourette's syndrome or Huntington's disease.

3.3 | Secondary analysis

There were 2413 Veterans who had a CMS or FDA-approved indication for antipsychotic use but were not on antipsychotic therapy at the time of CNH admission. Service-connected disability and dementia diagnoses were more prevalent than the main analysis sample (Table e1 in supporting information S1). There were similar patterns in how demographics and clinical characteristics varied across quintiles of antipsychotic use as observed in the group without CMS antipsychotic indications. In the regression (Table e2 in supporting information S1), we found that admission to CNHs in the top two quintiles of prevalent antipsychotic rates was associated with significantly greater odds of new antipsychotic than in the lowest quintile, OR = 1.61, 95% CI: 1.11–2.34 (quintile 4 vs. 1), and OR = 1.72, 95% CI: 1.18–2.50 (quintile 5 vs. 1).

4 | DISCUSSION

This is the first study to examine how nursing homes that the VA contracts with to provide long-term care perform on the use of antipsychotic medications—a quality measure that CMS monitors and reports publicly. Our study found that antipsychotic-naïve Veterans were more likely to initiate antipsychotic medications when admitted to CNHs with average or higher than average prevalent rates of antipsychotic prescribing among all residents. Veterans in CNHs with the highest prevalent rates of antipsychotic prescribing were significantly more likely to acquire a new diagnosis of an exclusionary condition, mainly schizophrenia, compared with Veterans admitted to CNHs with lower proportions of all residents receiving antipsychotics. We observed a similar phenomenon of antipsychotic initiation regardless of whether a Veteran had a clinical indication for receiving antipsychotics at the time of being admitted to a CNH.

Prior research found that nursing homes substantially under-report antipsychotic use among residents despite federal regulations mandating full disclosure (Briesacher et al., 2020). Studies also indicate the apparent prevalence of conditions associated with indicated prescribing (e.g., schizophrenia) increased in response to CMS policy, suggesting that nursing homes changed their diagnosis and/or MDS documentation practices (Briesacher et al., 2020; Winter et al., 2019, 2020). Our analysis found that a Veteran had significantly greater odds of acquiring a new indication when admitted to a CNH in the top quintile of prevalent rates of antipsychotic use. The increased reporting of diagnoses excluded from quality measure auditing may indicate an unintended consequence of potential mislabeling of residents to justify the use of antipsychotics (Briesacher et al., 2020; Winter et al., 2019, 2020). This practice inflates the apparent reductions in antipsychotic prescribing, and is one that leading long-term care, psychiatry, and pharmacy organizations (e.g., American Geriatrics Society, American Medical Directors Association, American Psychiatric Association) have cautioned clinicians against. A 2017 joint summary statement emphasized that new onset of schizophrenia is uncommon in older adults and that underlying dementia makes diagnosing late-life schizophrenia particularly challenging (Statement, 2017).

We found that an underlying diagnosis of bipolar disorder was a strong predictor of acquiring a new indication for antipsychotic use. Although bipolar disorder is an FDA-approved indication for antipsychotic use; it is not among conditions that CMS excludes in antipsychotic quality measures. This discrepancy could motivate clinicians to label individuals as having schizophrenia, Tourette's syndrome and Huntington's disease to avoid penalties to the nursing home in public reporting—despite such use being potentially warranted. In this regard, there is complexity in meeting resident clinical needs in the context of not only regulatory oversight aimed at reducing off-label antipsychotic prescribing but also limited nursing home resources (e.g., staffing, access to effective nonpharmacologic alternatives to antipsychotics).

While the high incidence of antipsychotic initiation among Veterans who were antipsychotic-naïve at admission is concerning, it raises the question of whether these individuals may have

TABLE 4 Adjusted association between prevalent rates of antipsychotic use in VA-contracted community nursing homes and new diagnosis of schizophrenia, Tourette's syndrome and Huntington's disease

	Odds ratio	95% confidence interval		p-value
Facility characteristics				
Antipsychotic prescribing quintile				
2 versus 1	0.67	0.40	1.15	0.149
3 versus 1	0.98	0.61	1.60	0.947
4 versus 1	1.17	0.71	1.92	0.533
5 versus 1	2.09	1.32	3.32	0.002
Overall star rating 1–3 versus 4–5	0.83	0.62	1.12	0.217
Number of veterans in CNH at admission				
7–12 versus 1–6	1.08	0.72	1.61	0.729
13+ versus 1–6	1.02	0.70	1.50	0.916
Demographic characteristics				
Age				
55–64 versus <55	1.10	0.53	2.26	0.805
65–74 versus <55	0.96	0.48	1.90	0.894
75–84 versus <55	1.08	0.52	2.25	0.834
85+ versus <55	0.55	0.26	1.15	0.110
Male	1.36	0.74	2.51	0.320
Race and ethnicity				
Black versus White, non-Hispanic	1.49	1.03	2.15	0.034
Hispanic versus White, non-Hispanic	1.37	0.62	3.03	0.437
Other versus White, non-Hispanic	0.29	0.06	1.32	0.111
Unknown versus White, non-Hispanic	1.14	0.62	2.11	0.676
Married	0.47	0.35	0.64	<0.001
Urban home residence	0.82	0.59	1.15	0.248
Clinical and other characteristics				
Priority group other versus 1	4.27	2.39	7.61	<0.001
Medicaid	0.46	0.10	2.02	0.304
Medicare	0.36	0.25	0.53	<0.001
Hospitalization in year prior	0.87	0.49	1.54	0.627
Admitted from a hospital discharge	1.25	0.71	2.19	0.438
CLC at home VAMC	1.13	0.75	1.70	0.559
Comorbidities				
Myocardial infarction	0.44	0.23	0.85	0.014
Peripheral vascular disease	0.52	0.36	0.76	0.001
Dementia	0.72	0.50	1.03	0.068
Chronic pulmonary disease	0.76	0.54	1.07	0.114
Diabetes without complications	0.88	0.62	1.24	0.451
Diabetes with complications	0.67	0.42	1.07	0.098
Cancer	1.03	0.67	1.58	0.911

(Continues)

TABLE 4 (Continued)

	Odds ratio	95% confidence interval		p-value
Metastatic cancer	0.58	0.26	1.32	0.199
Mental health comorbidities				
Post-traumatic stress disorder	0.47	0.29	0.79	0.004
Bipolar disorder	22.34	15.52	32.03	<0.001
Substance use disorder	1.19	0.70	2.03	0.527
Depression	0.49	0.34	0.71	<0.001
Hospice care during CNH stay	1.31	0.66	2.63	0.443

Abbreviations: CLC, community living center; CNH, community nursing home; VAMC, VA medical center.

experienced unmet need for mental health treatment prior to their admission to a nursing home. It is possible that for some Veterans, CNH admission may have diminished or even eliminated previous barriers to accessing antipsychotic medications. A National Academies of Sciences, Engineering, and Medicine report found that 25% of Veterans who were enrolled in VA services and had mental health needs reported living more than 30 miles from a VA facility offering mental health services (Academies, 2018). Access to behavioral health care and ease of use (e.g., travel distance/time, appointment availability) are plausible contributing factors to Veterans not receiving antipsychotics prior to CNH entry particularly in rural locations. Another study identified additional barriers to VA mental health services use including socio-cultural attitudes that reinforce perception of help-seeking as weakness, low confidence in VA system, and concerns over privacy and security of health information (Cheney et al., 2018). As such, opportunities exist to optimize the delivery of mental health care within VA as this may have implications for patterns of treatment among Veterans who engage in care from non-VA providers.

With increases in VA-paid care in the community expected following implementation of the MISSION Act, comparing the quality of purchased nursing home care to other available nursing homes is essential (Intrator et al., 2020). Our analysis indicated that almost three-quarters of contracted nursing homes had greater prevalent rates of antipsychotic use than nursing homes without VA contracts. Purchasing practices vary because contracting is conducted by individual VAMCs; therefore, there is an opportunity for VAMC administrators to consider quality measures (antipsychotic and others) in the recruitment, contracting, and oversight of community nursing homes (Miller et al., 2015).

Our study has limitations. First, unmeasured confounding may exist if unobserved unmet need for antipsychotics is associated with admission to a CNH with higher rates of prevalent antipsychotic prescribing. Second, adjusting for star rating could attenuate findings toward the null because ratings are determined in part by antipsychotic prescribing. We opted to include this covariate to control for other aspects of CNH quality. Lastly, we cannot unequivocally determine the appropriateness of the observed antipsychotic

prescribing owing to potential incomplete documentation of diagnoses or other unobserved reasons.

5 | CONCLUSIONS AND IMPLICATIONS

This study contributes meaningfully to the discourse on VA-paid care in community settings. The findings indicate the prevalent proportion of nursing home residents prescribed antipsychotics is significantly associated with increased new initiation of antipsychotic therapy among Veterans. CNHs with the highest proportions of residents receiving antipsychotics were substantially more likely to diagnose Veterans with predominantly schizophrenia among other conditions that justify antipsychotic medications. Opportunities for VA to provide additional reimbursement and clinical support to CNHs—particularly those with limited resources—(e.g., social workers, registered nurses, or qualified mental health professionals) deserve attention. Additionally, VA administrators could avoid contracting with nursing homes with high antipsychotic prescribing to improve the quality of long-term care purchased in community nursing homes.

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CONFLICT OF INTEREST

Vincent Mor receives compensation for his role as Chair of the Scientific Advisory Committee of naviHealth, a post-acute care convening company serving managed care companies and integrated hospital systems. The other authors have nothing to disclose.

DATA AVAILABILITY STATEMENT

The study data are not available due to data use agreements which prohibit sharing the data.

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