Prescribing Patterns in Nursing Home Residents Living with Dementia by Specialty and Provider Type

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Introduction/Background

By 2060, nearly 14 million people are expected to be living with dementia.[1] Treating the complex clinical and behavioral issues of *people living with dementia* (PLWD) is difficult because behavioral symptoms often occur in combination with pain symptoms[2–4] and in a context of increasing cognitive impairment and communication challenges as dementia severity progresses. Little is known about the contributions of different clinical specialties in prescribing medications for this population nor about prescribing patterns by clinical specialty and provider type. In this report, we examine prescribing patterns for common psychiatric medications and for opioid and non-opioid analgesics in long-term nursing home residents with dementia by clinician specialty and provider type.

Methods

Using CMS data for the entire 2018 fee-for-service (FFS) Medicare population, we identified long-term nursing home residents with a dementia diagnosis who had at least one prescription in Medicare Part D and did not have a cancer or hospice claim. We then determined these residents' level of cognitive impairment using the Brief

Interview for Mental Status (BIMS), indicating either no cognitive impairment or moderate/severe cognitive impairment. We calculated the number and percentages of prescriptions for antipsychotics, antianxiety, antidepressants, hypnotics, benzodiazepines, opioids, and non-opioid medications for nursing home residents with and without moderate/severe cognitive impairment. We also examined these psychiatric and pain medication classes by clinician specialty and provider type. Specialties included primary care, geriatrics, behavioral health, and other specialties. Provider types included physicians, nurse practitioners (NPs), physician assistants (PAs), and other clinicians.

Results

We identified 365,090 long-term nursing home residents with a dementia diagnosis in 2018. Approximately 80% of these residents had moderate or severe cognitive impairment. Just under half were over 85 years old and nearly two-thirds had a mental health diagnosis. Most residents had prescriptions for antidepressants (64%) and a third were taking opioids (34%). Antipsychotics and benzodiazepines were prescribed in about a quarter of the population (26% and 20% respectively). Residents with moderate or severe cognitive impairment were less likely to receive opioid or non-opioid analgesics. Clinicians in primary care provided over 70% of prescriptions across all psychiatric drug classes and over 80% of prescriptions for opioid and non-opioid medications in both individuals with and without moderate/severe cognitive impairment. Providers with specialized training in geriatrics provided approximately 10% of prescriptions across all medication classes, while clinicians in behavioral health prescribed under 8% of psychiatric medications and under 1% of pain medication in both residents with and without moderate/severe cognitive impairment. Results by specialty and provider type illustrated that physicians across specialties were more involved with the prescribing of behavioral health medications compared to NPs and PAs, while NPs and PAs were more involved with the prescribing of pain medications than physicians. The proportion of benzodiazepine and opioid prescriptions were larger for NP and PA providers compared to physicians.

Conclusions

Clinicians in primary care provided most of the psychiatric and pain medications for nursing home residents with dementia. The contributions of providers from geriatrics and behavioral health were limited. Many nursing home residents living with dementia received an antipsychotic, benzodiazepine, or an opioid, all which are medications to be avoided in older adults with dementia. Given the complexity of prescribing for this vulnerable population and the limited specialized dementia training opportunities for primary care providers, continuing medical education should be offered and perhaps mandated in combination with clinical support mechanisms and adequate nursing home staffing. To address the potential undertreatment of pain in nursing homes for residents living with dementia, efforts aimed at developing pain prescribing guidelines for this population seem warranted.

Introduction/Background

One in nine people in the US over the age of 65 and one-third of those over 85 have dementia. With the lack of an effective cure,[5] these numbers are expected to increase in the coming decades.[6] This increase will strain a healthcare system that already faces a significant shortage of clinicians who provide care to PLWD, such as primary care providers and specialists in fields such as geriatric medicine[7,8] and psychiatry.[9,10]

A diagnosis of dementia often occurs alongside other comorbid physical conditions common in older adults, including hypertension, heart disease, and diabetes. In addition, it is estimated that between 50% and 80% of nursing home residents with dementia experience pain.[11,12] Managing the complex behavioral symptoms of dementia often takes place in the context of managing pain and comorbidities, making the prescribing of medications especially challenging. Research suggests that polypharmacy is common in this population[13] and that many clinicians do not feel equipped to manage the complexity of the clinical symptoms in PLWD.[14,15]

As their dementia progresses and behavioral symptoms increase, PLWD are more likely to receive care in nursing homes.[16–18] Prior research suggests that 70% of nursing home residents may have dementia.[19] Clinicians providing health care to this population are often required to manage progressing behavioral symptoms, polypharmacy issues from multi-comorbidities, and adjustments of medications due to potentially inappropriate

medication (PIM) in the elderly.[20] Despite this, primary care physicians traditionally provide the majority of care for nursing home residents and research suggests that the use of specialist services declines upon nursing home admission.[21] Increasingly, nurse practitioners and physician assistants provide both specialist care services and primary care in skilled nursing facilities and in nursing homes.[22,23]

To date, little is known about prescribing patterns of primary care providers and specialist clinicians in the nursing home setting. Limited evidence from a study of a single nursing home suggests that differences in prescribing patterns may exist between geriatrics-trained and family-medicine trained providers.[24] With the urgency to increase the dementia care workforce, research that examines care patterns by specialty and provider type in PLWD, including prescribing patterns, can provide useful evidence for the development of workforce strategies aimed at growing the dementia care workforce. To this end, this study aimed to examine psychiatric and pain medication prescribing patterns in nursing home residents with dementia by provider specialty and provider type.

Methods

Data:

This study used multiple Medicare files for the year 2018, including the Master Beneficiary Summary File (MBSF), Medicare Part D pharmacy claims, the Minimum Data Set (MDS) 3.0, and supplementary files such as the Chronic Condition Data Warehouse file and the National Plan & Provider Enumeration System (NPPES) file. The MBSF was used to identify nursing home resident characteristics, including demographic characteristics such as age, gender, race, and location. In addition, we obtained resident-level information about comorbidities, such as a diagnosis of Alzheimer's Disease and Related Dementias (ADRD), from the Chronic Condition file. The MDS 3.0, a mandatory, standardized assessment completed for every nursing home resident at admission and quarterly thereafter, or with a significant change in health status, was used to identify whether individuals were long-stay nursing home residents. The MDS is assessed for all residents of nursing homes certified by CMS to accept Medicare or Medicaid payment (~96% of US nursing homes) and is conducted by MDS certified nurses. It has over 400 items measuring cognitive, functional, and clinical characteristics of residents, including cognitive impairment. For this study we used the admission, assessment, and discharge dates to determine whether a resident was a short- or long-term NH resident. We identified long-stay nursing home residents by cumulative days in a NH of greater than 100 days, consistent with CMS' definition of long-stay.[25] Medicare Part D pharmacy claims were used to determine the types of medications a NH resident was prescribed. The National Provider Identification (NPI) number in the pharmacy claims was used to link Part D data to NPPES data to identify the specialty and type of the providers prescribing medications, key variables of interest for this study (see below).

Design and Sample:

We conducted a retrospective descriptive analysis of the entire 2018 fee-for-service Medicare population age 65 years and older who had at least one nursing home stay of greater than 100 days, at least one prescription in Medicare Part D during 2018, and a CMS ADRD diagnosis flag. The CMS Chronic Condition algorithm assigns an ADRD diagnosis to beneficiaries with at least one dementia diagnosis code in the previous three years in either an inpatient, outpatient, skilled nursing facility, or hospice claim. Other sample selection criteria applied were continuous enrollment in Medicare Parts A, B, & D, and exclusion of NH residents with a cancer or hospice claim.

Measures and Analysis:

We calculated numbers and percentages of prescriptions by clinician specialty across common psychiatric and pain medication drug class, including antipsychotics, antianxiety, antidepressants, and hypnotics. We examined benzodiazepines as a standalone drug class due to their problematic side effects in older adults and for PLWD.[20,26,27] For pain medications, we grouped drug claims into opioids and non-opioid analgesics. All prescription claims were standardized to 30-day supply to account for differences in the number of days supplied on each claim. Clinician specialties were grouped into primary care, geriatrics, behavioral health, and providers working in other specialties. Physicians working in internal medicine, family medicine, general practice, and primary care were considered to be working in primary care. NPs with taxonomy codes in adult, family and

primary care were also considered to be in the primary care specialty. Physician assistants do not have formal specialties that can be identified with taxonomy codes and so were included in primary care.

Geriatric providers included physician specialties of geriatric medicine, palliative care and hospice, as well as adult/gerontology NPs. Mental health, psychiatry, addiction medicine, and geropsychiatry were considered behavioral health specialties; psychiatric mental health nurse practitioners were also included in behavioral health. In additional analyses, we identified the type of clinician within each specialty. Clinician types included physicians, nurse practitioners (NPs), physician assistants (PAs), and other. Other providers included clinicians such as psychologists, who are allowed to prescribe in some states.

We stratified analysis by severity of cognitive impairment using the Brief Interview for Mental Status (BIMS) from the MDS assessment data, which is a validated measure of cognitive ability.[28,29] A BIMS score of 13 to 15 is considered intact and a score of less than or equal to 12 is considered moderate/severe cognitive impairment.[30]

Results

We identified 365,090 long-term nursing home residents with an ADRD diagnosis in 2018 who had at least one medication fill. Of those, 80% had moderate or severe cognitive impairment, while 20% had a BIMS score of 13 or greater indicating no cognitive impairment. Just under half of nursing home residents were over 85 years old. Nearly two-thirds had a diagnosis of any mental illness and nearly 30% had either a diagnosis of schizophrenia or bipolar disorder or both. Table 1 shows summary statistics for the population.

Table 1: Summary characteristics of long-stay nursing home residents with ADRD (n=365,090)

Nursing home resident characteristics	Number of NH residents	% of population
Age 65-84	203,183	56%
Age 85+	161,907	44%
Female	251,153	69%
White	293,444	80%
Black	50,017	14%
Hispanic	8,250	2.3%
Other race	13,379	3.7%
Dual Eligibility	310,345	85%
Mental Illness [Overall]	238,186	65%
Schizophrenia	67,753	19%
Bipolar Disorder	37,949	10%
Anxiety	128,997	35%
Substance Use Disorder	11,876	3.3%
BIMS score 13+ (intact)	73,210	20%
Rural location	65,627	18%

Examining population characteristics by specialty and provider type (Table 2) illustrated that primary care and geriatric clinicians provided care to a larger share of individuals over the age of 85 compared to behavioral health providers and clinicians from other specialties (between 40% and 44% for PC providers compared to 32% and 38% for BHV/other providers) In contrast, behavioral health clinicians provided care to a larger share of residents with a mental health diagnosis (approximately 78% for BHV clinicians compared to 62% and 68% of PC providers and geriatric providers). The share of residents with moderate/severe cognitive impairment was relatively similar

between specialty and provider types, ranging between 80% for primary care MDs, geriatric MDs and psychiatric NPs and 76% for primary care PAs and 71% for other MDs.

Table 2: Population characteristics in percent by specialty and provider type

	PC-MD	PC-NP	PC-PA	Geri-MD	Geri-NP	BHV-MD	BHV-NP	Other-MD	Other-NP	Other
65-84	56	58	60	56	56	69	68	63	62	60
85+	44	42	40	44	44	31	32	37	38	40
Female	69	70	69	69	71	66	69	66	69	67
White	81	83	84	78	84	79	82	78	81	79
Black	13	13	11	16	12	13	13	15	15	15
Hispanic	2.20	1.80	1.90	2.40	1.40	3.90	2.00	2.80	1.70	2.60
Other	3.50	2.60	2.90	3.90	2.40	3.90	2.40	4.30	2.50	3.90
Dual Eligibility	85	85	83	86	84	89	89	83	86	81
Mental Illness [Overall]	66	66	68	64	62	78	79	69	68	67
Schizrenia	19	19	19	19	17	38	35	19	19	20
Bipolar Disorder	11	11	12	10	10	21	21	12	12	11
Anxiety	36	38	40	34	36	48	54	38	40	37
Substance Use Disorder	3.30	3.50	4.30	3.30	3.10	4.40	4.20	4.40	4.20	4.00
BIMS score 13+ (intact)	20	23	26	20	23	22	20	29	27	28
Rural	19	16	22	8.80	13	14	18	16	13	18

Psychiatric and pain medication use in nursing home residents living with dementia

Table 3 shows summary characteristics of the psychiatric and pain medication classes prescribed for long-stay nursing home residents with dementia. Most residents were receiving antidepressants (64%) and a third were taking opioids (34%). Antipsychotics and benzodiazepines were prescribed in about a quarter of the population (26% and 20%, respectively). In addition to the psychiatric and pain medication classes examined, nearly all residents were prescribed additional medications.

Table 3: Summary characteristics of psychiatric and pain medications used in long-stay nursing home residents with ADRD

Drug Class	Number of NH residents	% of population
Antipsychotics	94,290	26%
Antianxiety	29,967	8%
Antidepressants	232,166	64%
Hypnotics	10,263	3%
Benzodiazepines	71,458	20%
Opioids	124,853	34%
Non-opioid analgesic	36,023	10%

Drug Class	Number of NH residents	% of population
Other medications	362,515	99%

A breakdown of summary characteristics of psychiatric and pain medication classes by moderate/severe cognitive impairment and no cognitive impairment revealed that individuals with moderate/severe impairment were more likely to be on an antipsychotic (26.5% vs 23.1%) and less likely to receive antidepressants (63.2% vs 65.2%), hypnotics (2.2% vs 5.2%), opioids (30.9% vs 47.3%) and non-opioid analgesics (8.8% and 14.1%).

Table 4: Summary characteristics of psychiatric and pain medications used in long-stay nursing home residents with ADRD and with and without moderate/severe cognitive impairment

Drug Class	Number of NH residents with moderate/severe impairment (BIMS <12)	% of population with moderate/severe impairment (BIMS <12)	Number of NH residents with no impairment (BIMS 13-15)	% of population with no impairment (BIMS 13-15)
Antipsychotics	77,353	26.50%	16,937	23.13%
Antianxiety	22,774	7.80%	7,193	9.83%
Antidepressants	184,464	63.20%	47,702	65.16%
Hypnotics	6,440	2.21%	3,823	5.22%
Benzodiazepines	57,284	19.63%	14,174	19.36%
Opioids	90,243	30.92%	34,610	47.27%
Non-opioids	25,700	8.80%	10,323	14.10%
Other Medications	289,599	99.22%	72,916	99.60%

Psychiatric and pain medication prescribing by provider specialty for PLWD and BIMS scores indicating no cognitive impairment or moderate/severe cognitive impairment

Figure 1 shows the percentages of psychiatric and pain medications by provider specialty for residents without cognitive impairment and with moderate/severe cognitive impairment. For both groups of residents, primary care providers prescribed at least 70% of behavioral health and pain medications, including more than 80% of both opioids and non-opioid analgesics. Providers with specialty training in geriatrics prescribed between 6.8% (hypnotics) and 9.4% (antipsychotics) of medications for individuals without cognitive impairment and between 7.2% (other non-opioid analgesics) and 10% (antidepressants) for individuals with moderate to severe cognitive impairment. The trend for geriatric providers to prescribe a slightly larger percentage of medications to residents with moderate to severe cognitive impairment was consistent across all drug classes. In contrast, both providers with behavioral health specialty expertise and from other (non-geriatrics) specialties tended to prescribe a slightly smaller share in residents with cognitive impairment compared to residents without cognitive impairment. This pattern was observed across all drug classes, with behavioral health providers prescribing between 0.14% (opioids) and 7.7% (antipsychotics) of medications in individuals without cognitive impairment and between 0.14% (opioids) and 6.0% (antipsychotics) in residents with moderate/severe cognitive impairment. Providers from other specialties contributed between 6.8% (antianxiety) to 10.2% (opioids) of medications across drug classes for residents without cognitive impairment and between 6.4% (benzodiazepines) and 8.6% (non-opioid analgesics) for residents with moderate/severe cognitive impairment. Behavioral health providers prescribed almost no pain medications.

Figure 1: Prescription percentages by provider specialty and by cognitive impairment
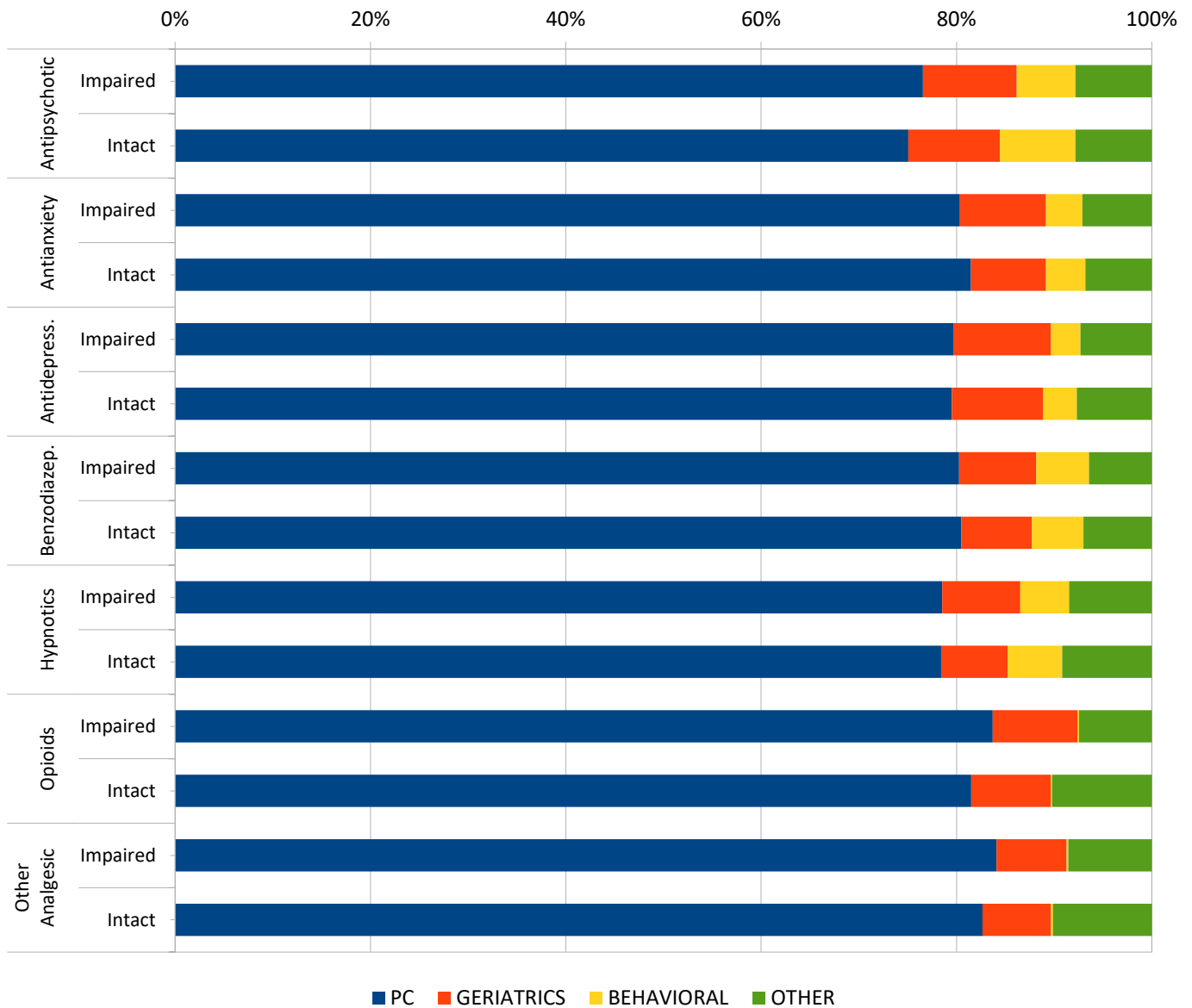
Psychiatric and pain medication prescribing by specialty and provider type for PLWD and BIMS scores indicating no cognitive impairment or moderate/severe cognitive impairment

Tables 5 and 6 present percentages for psychiatric and pain medications by specialty and provider type for residents with and without moderate/severe cognitive impairment. Antidepressants were the most frequently prescribed psychiatric medications by all providers regardless of specialty in both residents with and without moderate/severe cognitive impairment. For physicians in primary care, geriatrics, behavioral and other specialties, as well as for psychiatric mental health NPs, approximately half of all prescriptions were for antidepressants. The second largest group of medications were anti-psychotics, with behavioral health physicians and psychiatric mental health NPs prescribing about a third of their medications from this drug class for both individuals with and without moderate/severe cognitive impairment.

Table 5: Percentages of psychiatric and pain medications by specialty and provider type in residents with moderate/severe cognitive impairment

	Overall	PC-MD	PC-NP	PC-PA	Geri-MD	Geri-NP	BHV -MD	BHV-NP	Other-MD	Other-NP	Other
Antipsychotic	19.48	19.47	13.60	15.31	20.33	13.93	35.42	29.97	20.61	12.85	21.25
Antianxiety	3.79	3.94	3.11	2.59	3.56	3.21	3.81	4.98	3.92	3.69	3.07
Antidepressants	54.59	56.76	40.22	41.63	59.37	41.69	47.25	50.22	54.20	39.30	54.48
Hypnotics	0.90	0.82	1.35	1.13	0.74	0.95	1.51	0.72	0.98	1.15	1.13
Benzodiazepine	7.63	6.41	16.19	14.72	5.48	14.73	11.32	13.94	5.65	17.01	7.74
Opioids	10.34	8.95	23.45	22.03	8.00	23.41	0.51	0.11	10.40	23.89	9.31
Non-opioids	3.27	3.65	2.08	2.59	2.52	2.08	0.18	0.06	4.23	2.10	3.01
Total	100	100	100	100	100	100	100	100	100	100	100

Table 6: Percentages of psychiatric and pain medications by specialty and provider type in residents without cognitive impairment

	Overall	PC-MD	PC-NP	PC-PA	Geri-MD	Geri-NP	BHV -MD	BHV-NP	Other-MD	Other-NP	Other
Antipsychotic	15.38	15.37	9.64	10.33	17.43	8.34	33.49	30.09	14.30	7.70	16.35
Antianxiety	3.93	4.18	3.21	2.65	3.50	2.92	4.02	5.65	3.42	3.42	2.92
Antidepressants	51.08	53.84	35.28	38.04	56.25	38.91	48.23	49.69	47.26	34.49	51.06
Hypnotics	1.90	1.71	2.91	2.42	1.36	2.43	3.28	1.59	2.18	2.84	1.98
Benzodiazepine	7.22	6.24	13.77	12.16	5.15	12.25	10.02	12.37	5.26	13.14	7.53
Opioids	16.17	13.87	32.46	30.92	12.73	32.73	0.69	0.47	22.00	34.90	15.06
Non-opioids	4.32	4.78	2.73	3.49	3.57	2.41	0.27	0.15	5.58	3.50	5.10
Total	100	100	100	100	100	100	100	100	100	100	100

Benzodiazepines were the third largest group of psychiatric medications, with approximately 7% prescribed in both residents with and without moderate/severe cognitive impairment. However, there was a large variation in benzodiazepine prescribing by provider type. For primary care NPs, benzodiazepine prescriptions constituted 16.2% of medications for individuals with moderate/severe cognitive impairment and 13.8% for individuals with no cognitive impairment. Among physician assistants, it was 14.7% and 12.2% respectively. In contrast, for primary care physicians, benzodiazepine prescriptions were nearly identical between the groups, consisting of 6.4% of their total prescriptions when prescribing for individuals with moderate/severe cognitive impairment and 6.2% when prescribing for residents without. Similarly, for geriatric NPs, benzodiazepine prescriptions were 14.7% and 12.3% of their total prescriptions for individuals with and without cognitive impairment. The shares of benzodiazepines for geriatric physicians were also nearly identical, at 5.5% and 5.2% for residents with and without cognitive impairment. A similar pattern was noted when comparing the proportions of benzodiazepine prescriptions for NPs in behavioral health and from other specialty areas to the proportions of benzodiazepine prescriptions from geriatric physicians and physicians from other specialties.

For pain medications, nursing home residents with moderate/severe cognitive impairment had a smaller percentage of opioid prescriptions (10.3%) than residents without cognitive impairment (16.2%). For specialty and provider type specific opioid prescribing patterns, a similar pattern to benzodiazepines was observed. The prescription shares for opioid medications from primary care NPs were 23.5% for residents with and 32.5% for residents without cognitive impairment, while opioid shares for primary care physicians were 9.0% for residents with and 13.9% for residents without cognitive impairment. Opioid prescriptions among PAs were 22% when prescribing for individuals with moderate/severe cognitive impairment and 31.1% when prescribing for individuals without cognitive impairment. Similarly, geriatric NPs' opioid shares were 23.4% for individuals with and 32.7% for individuals without cognitive impairment, while opioid shares from geriatric physicians were 8% for individuals with and 12.7% for individuals without moderate/severe cognitive impairment.

Conclusions

This study examined psychiatric and pain medication prescribing patterns in long-stay nursing home residents living with dementia by provider specialty and provider type. We conducted analyses for subgroups of residents with no cognitive impairment and those with moderate/severe cognitive impairment. We found that the use of antipsychotics and benzodiazepines were frequent in this population, despite the fact that these medications are considered potentially inappropriate medications (PIMS) in older adults with dementia, according to the Beers Criteria, a widely used list of medication criteria published by the American Geriatrics Society (AGS) aimed to guide practicing clinicians prescribing for older adults.[20] In our data, antipsychotics were prescribed in over a quarter of NH residents with moderate/severe cognitive impairment and in just under a quarter of NH residents with no cognitive impairment. These findings are consistent with other research reporting antipsychotic use of 20% to 25% in NH residents.[31,32] However, while prior research has documented a decline in the use of antipsychotics from 25% to 22% over the period from 2009 to 2015, our data suggest that the decline may not have continued, with an overall percentage of antipsychotic use of 26% in 2018.

The use of benzodiazepines in residents with and without moderate/severe cognitive impairment was approximately 19% in both groups, despite benzodiazepines also being listed as a medication to be avoided in older adults with dementia due to risks of falls, factures, cognitive impairment, and delirium.[20,26,27] Our study expands the findings of previous research that found benzodiazepine use (for both short- and long-acting benzodiazepines) in the nursing home setting to be nearly 20% from 2013 to 2014[33] and 16% from 2013 to 2018.[34] Population prevalence rates of other psychiatric medication classes examined in this report, including antidepressants, antianxiety, and hypnotics were also consistent with prior research.[32,33]

Our analysis of pain medication use revealed that residents with moderate/severe cognitive impairment were much less likely to be prescribed an opioid compared to residents with no cognitive impairment (47.3% vs 30.1%) and were also less likely to be prescribed non-opioid analgesics (14.1% vs 8.8%). While we did not examine pain prevalence or pain severity in this study, our results add to the evidence that PLWD in nursing homes receive fewer pain medications, and that pain may be undertreated in this population.[35–38] Also, while beyond the scope of the current analysis, in the current climate of deprescribing recommendations and national policies to reduce the prescribing of opioids, people with cognitive impairment may have greater suffering from poorly managed pain.

Analyses examining the contributions of the clinical specialties in providing psychiatric and pain medications to NH residents with dementia, including primary care, geriatrics, behavioral health, and other specialties, documented the extensive role of primary care providers in providing medications in the nursing home setting. Primary care clinicians prescribed two-thirds of medications across all major psychiatric drug classes and over 80% of pain medications. When we examined the proportions of medications in each drug class as the total number of prescriptions by specialty and provider type, results illustrated that physicians across specialty areas were generally more involved with the prescribing of behavioral medications compared to NPs and PAs,

especially for the drug classes of antipsychotics and antidepressants, while NPs and PAs were contributing more to the prescribing of pain medications compared to physicians. Additionally, NPs with specialties in primary care, geriatrics, behavioral health, and other specialties had considerably larger proportions of benzodiazepine prescriptions than their physician colleagues from the same specialties. The same was true for PAs and physicians practicing in primary care. Similar patterns were noted for opioid prescriptions by NPs with training in primary care, geriatrics, and other specialties. With the exception of behavioral health NPs, the proportions of opioid prescriptions for NP clinicians were considerably larger than the proportions of opioids from their physician colleagues.

There are multiple possible explanations for this. While our analysis did not adjust for multiple comorbidities and other non-resident factors, population characteristics by specialty and provider type indicated that residents with a diagnosis of anxiety were more likely to be receiving medications from NPs. Further, behavioral health NPs were providing care for slightly larger percentages of residents with moderate/severe cognitive impairment than behavioral health physicians, which could explain the increased shares of benzodiazepines for these clinicians. In addition, geriatrics and behavioral health NPs were more likely to practice in rural areas than their physician counterparts. Rural areas have often higher rates of benzodiazepine and opioid use.[34,39] Even though residents receiving medications from primary care or geriatric NPs were not more likely to have moderate/severe cognitive impairment, it is possible that NPs were more likely to care for residents with severe cognitive impairment, which our study did not examine. Other explanations could be that NP clinicians are caring for residents with higher rates of chronic pain and higher rates of long-term opioid use. Future research should examine prescribing patterns of these medication classes by specialty and provider type accounting for resident and facility level factors.

Although the Beers Criteria consider antipsychotics, benzodiazepines, and opioids potentially inappropriate medications in PLWD that should be avoided, especially in combination with one another,[20] these medications were prescribed frequently in our data. Our results showed the substantial involvement of primary care providers in providing medications for PLWD in the nursing home setting, but previous research has indicated that primary care providers often feel underprepared to provide services for patients with complex behavioral health needs.[40] Difficult medication schedules, multiple comorbidities, and communication challenges can make providing care for PLWD demanding. With large projected increases in the numbers of PLWD in the coming years, the roles of primary care providers, especially NPs and PAs, are likely to grow. Systematic training opportunities must be provided for all providers caring for this vulnerable population, especially to those who may not have had the opportunity to formally acquire specialized clinical knowledge on this population through their educational career paths.

Policy Implications & Recommendations
Systematic continuing medical education (CME) opportunities with possible mandatory educational requirements may be one avenue through which physicians, NPs, PAs, and other providers may gain current knowledge on how best to follow clinical prescribing guidelines to treat behavioral, pain, and other symptoms from multiple comorbidities. The development of concrete national deprescribing guidelines[41,42] and nursing home specific policies on medication use may also be helpful but should be considered based on each individual's health status. Our data support previous results that nursing home residents with cognitive impairment are in need of better pain treatment. Nursing homes should encourage informal provider training opportunities, such as clinician journal clubs that allow knowledge sharing and team building, to support providers. Furthermore, residents should have access to non-pharmacological approaches, such as behavioral therapy, aromatherapy and therapeutic touch, and other types of complementary and alternative treatments that may be especially helpful for managing behavioral symptoms in individuals with cognitive impairment.[43] Finally, facility-level factors, such as adequate staffing, can help providers appropriately manage behavioral symptoms without benzodiazepines and opioids.

Limitations

This study had several limitations. First, this analysis was unable to assess whether medications were clinically indicated and whether medications were taken by nursing home residents. Second, we are unable to distinguish whether a prescription was a standing prescription or prescribed on an as needed basis. Third, the study was entirely descriptive, and thus resident and facility characteristics were not accounted for in our analysis. Fourth, taxonomy codes of providers that we used to determine specialties may have been outdated since providers may delay updating their board certification. Five, due to Medicare rules that allow some NP services to be billed under physician services, it is likely that some NP prescriptions were misattributed to physicians.

In conclusion, the results from this report highlight the extensive roles of primary care providers in managing the complex needs of nursing home residents with dementia. To help clinicians with implementing prescribing patterns that follow clinical guidelines for older adult with dementia, a multipronged approach is needed, including providing educational opportunities, clinical support mechanisms, and improved nursing home staffing.

Acronyms Used in this Report

PLWD: People with dementia
ADRD: Alzheimer's Disease and Related Dementias
PC: Primary care
Geri: Geriatrics
Bhv: Behavioral
NP: Nurse practitioners
PA: Physician assistants
MD: Physician
BIMS: Brief Interview for Mental Status
NH: Nursing home

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