amda
Dedicated To Long Term Care Medicine

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Dear Medical Director,

Over the past few months, AMDA-Dedicated to Long Term Care Medicine has partnered with the Centers for Medicare & Medicaid Services (CMS), as well as several other organizations, in an effort to improve care provided to nursing home residents with dementia under a new, joint behavioral health initiative.

Dementia can significantly impair a resident's ability to effectively communicate his/her needs and concerns. Communication attempts may appear as behaviors that are disruptive or distressing. It is therefore essential to gain an understanding of what is driving these behaviors prior to initiating an intervention or treatment. Sometimes these behaviors may result from an undiagnosed medical condition, an adverse reaction to medication, unmet physical need, or mental illness.

In April 2011 the Department of Health and Human Services Office of Inspector General (OIG) released the report, *Medicare Atypical Antipsychotic Drug Claims for Elderly Nursing Home Residents* (http://oig.hhs.gov/oei/reports/oei-07-08-00150.pdf). The report found that in some circumstances antipsychotic medications are being prescribed in an attempt to manage the behaviors of patients with dementia and psychological symptoms, but who did not have an approved indication for their use. While off label prescribing in this context does not always constitute inappropriate prescribing, use of antipsychotic drugs do have significant health risks in this population. This report, and other recent reports, has led to heightened regulatory, legislative, and consumer awareness of the potential dangers these medications may cause for individuals with dementia. Such efforts also complement the recently released, "*Draft Framework for the National Plan to Address Alzheimer's Disease*" by the U.S. Department of Health and Human Services.

We are asking you, as the medical director of your facility, to join with AMDA and CMS, in the nationwide effort to reduce the unnecessary use of antipsychotic agents by refocusing the interdisciplinary team on a better understanding of the root cause of dementia related behaviors.

In this regard, we encourage you to share and discuss the following information with your facility.

Medical Director's Role as Clinical Leader in Dementia Care

The medical director leads the team that provides the clinical care to the residents in the facility. In that role, medical directors should help to implement policies and procedures that promote a process of person-centered care, learning "the story" behind each resident, evaluating the behavior changes and excluding potential medical causes of behavioral symptoms. If policies are already in place, the medical director should help to educate the team in existing policies and procedures and ensure that those policies have been implemented. Nursing home policies should direct the staff to identify resident-specific needs, optimize choices, and promote consistent assignment so that staff knows residents well enough to meet their specific care needs. Education should foster the staff's understanding of dementia-related behavior as a form of communication.

Policies should also promote staff's ability to identify relevant risks to any medication, provide parameters for monitoring medications, and institute a process for staff and prescriber reassessment of the resident's response to treatment over time. While there is an established, evidence-based role for antipsychotic medications in managing psychoses, such as schizophrenia and bipolar mania, we are concerned about potential unnecessary use of these medications in persons with behavioral and psychological symptoms related to dementia (BPSD). Medical directors are encouraged to educate facility staff, residents and families about appropriate use of antipsychotic medications, and to begin an ongoing dialogue and collaboration that focuses on non-pharmacologic interventions and person-centered dementia care for BPSD. Educational efforts should also address proper monitoring and the tapering of antipsychotic drugs when used.

As part of the facility's Quality Assessment and Assurance Committee, the medical director along with the administrator, consultant pharmacist and director of nursing should assist the facility with a review of the processes of care for those residents with BPSD on antipsychotic medications. Questions medical directors often ask during the review include the following:

- How many residents in the facility with BPSD receive antipsychotic medications and how is the use monitored?
- What is the process in the facility to initiate the use of these medications?
- What is the process for gradual dose reduction and discontinuation of these medications?
- How is the resident/family/or legal representative informed of the risks and benefits of the use of these medications? How are these discussions documented?

Use of An Interdisciplinary Team

One effective practice for monitoring the use of antipsychotic medications in a facility used by several of our AMDA members is to have the medical director work closely with an interdisciplinary team composed of nursing, social services, therapeutic recreation specialist and a pharmacist. This team meets regularly to review psychotropic drug use. Individual residents are discussed by the team during their quarterly assessments, or with initiation of psychotropic medications, or when there has been a change in the condition of a resident taking a psychotropic medication. During the meeting, the care plans and medical records are reviewed and resident's functional status, medications, presence of medication side effects and presence or absence of achieved goals for medication use are discussed. This practice emphasizes person-centered care. Recommendations from the interdisciplinary team are then made to or with the resident's attending physician. The team tracks the recommendations for acceptance by the primary care providers and effectiveness in the quality of care for the

resident. This information is further reviewed by the facility Quality Assessment and Assurance Committee for effectiveness in addressing the needs of the residents in the facility.

AMDA has developed comprehensive resources to assist medical directors with these issues. These include talking points, a medication management manual, clinical practice guidelines, a series of webinars, and a handbook for nursing home staff. A complete listing of AMDA resources is attached to this letter.

AMDA looks forward to working with you to improve long term care by standardizing our practices, educating the interdisciplinary care team, further developing strong relationships with residents and their advocates, and supporting caregivers in long term care. Increased prescriber training will help reduce unnecessary antipsychotic drug prescribing. AMDA looks forward to an ongoing collaboration with its medical directors.

Sincerely,

Matthew S. Wayne, MD,CMD
President AMDA

John G. Symeonides, MD, FAAFP, CMD
President, FMDA

fmda
Dedicated To Florida Long Term Care Medicine

AMDA Resources

- In 2011, AMDA released a series of talking points entitled "Appropriate Prescribing of Antipsychotics" to help minimize the *potential for inappropriate prescribing of psychoactive medications* (http://www.amda.com/advocacy/AMDA_Antipsychotics_Tlkg_Pts.pdf).
- AMDA has several tools for clinical use in the nursing home including:
    - Clinical Practice Guidelines: To establish best practices for medical staff, AMDA has developed clinical practice guidelines on dementia, delirium, and acute problematic behavior for use as evidence-based tools to guide care.
        - http://www.amda.com/tools/guidelines.cfm
    - *Mental Health Documentation in the Nursing Home* and *Practical Psychiatry in the Long Term Care Home: A Handbook for Staff*, which is aimed at educating nursing and other staff.
        - http://www.amda.com/tools/mentalhealth.cfm
    - *Multidisciplinary Medication Management Manual*, provides practitioners in long term care with information and tools to help them improve patient care, enhance medication management, and reduce medication errors. This manual includes a chapter on appropriate prescribing of psychoactive agents in the long term care setting, which is designed to help guide physicians regarding such issues as the clinical and regulatory documentation necessary when residents are prescribed psychoactive medications.
        - http://www.amda.com/resources/print.cfm#MED

- AMDA has hosted a series of educational Webinars on the issue including:
    - *Medication Management: the Doc, F329, and the OIG*. The learning objectives for this webinar included: delineating medication management as it is regulated in nursing homes; discussing the May 2011 report by the OIG concerning psychotropic drug use in nursing homes; and discussing roles of the medical director and physicians practicing in long term care concerning optimizing medication management for nursing home resident.
        - http://www.amda.com/cmedirect/webinars/web1106E.cfm
    - AMDA's e-University hosted a webinar on June 28, titled *Medication Management: Antipsychotic Drug Use Reduction 2012. To learn more, visit,* http://www.amda.com/cmedirect/webinars/web1206E.cfm.
    - *Use of Psychoactive Medications with Special Emphasis on Antipsychotics in the Long-Term Care Setting*. The learning objectives for this webinar included: recognizing how to analyze and evaluate problematic behavior vs. behavioral symptoms related to dementia; discussing approaches to changing or removing triggers for problematic behavior with non-pharmacological approaches; and describing the appropriate use of psychoactive agents in the long-term care setting.
        - http://www.prolibraries.com/amda/?select=session&sessionID=773
    - *The True Meaning of Non-Pharmacologic Management of Behavioral Symptoms in Older Adults with Cognitive Impairment* emphasized the use of non-pharmacologic interventions as the first-line approach to managing disruptive and/or potentially dangerous behavioral symptoms in persons with dementia. The webinar provided a comprehensive, multi-disciplinary approach to these challenging clinical situations and also provided participants with knowledge enabling them to effectively design and implement non-pharmacologic interventions in their facilities.
        - http://amda.networkats.com/members_online/members/viewitem.asp?item=WEB1112E&catalog=SELF&pn=1&af=AMDA
- More resources on this topic are also located here: http://www.amda.com/advocacy/brucbs.cfm

Florida Partnership to Individualize Dementia Care in Nursing Homes

The **Florida Partnership to Individualize Dementia Care in Nursing Homes** is a collaborative of long-term care stakeholders working to refine dementia care in nursing homes throughout the state of Florida. This collaborative formed to meet the CMS Partnership to Improve Dementia Care in Nursing Homes national goals. Collaboration should allow this partnership to reduce duplication of effort, pull resources, and work together to make sure this initiative is successful in Florida.

The partnership currently includes the following organizations: **Agency for Health Care Administration, Florida Health Care Administration, Florida Medical Directors Association, Florida Ombudsman, Florida Pioneer Network, FMQAI, Leading Age Florida, and the University of South Florida, College of Behavioral and Community Sciences.**

For Additional Resources or Information, Contact:

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Save the Date ~ October 17-20, 2013: FMDA's 22nd Annual Conference, "Best Care Practices in the Geriatrics Continuum 2013" at Disney's *Contemporary Resort* in Lake Buena Vista.

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Talking Points
Appropriate Prescribing of Antipsychotics
Effective Date July 2011

1. We support thorough evaluation and treatment of patients with behavioral issues.

- Medication therapy for nursing facility patients is often complex. Since antipsychotic medications are all psychoactive medications, they are potentially dangerous, and none have been FDA approved to treat dementia related behaviors. The use of antipsychotic medications should be limited to treating dementia-related behaviors that are unresponsive to conservative management and done only after thoughtful evaluation, identification of appropriate indications, and consideration of the benefits and risks involved.
- Nursing facility residents often have multiple conditions that require management with multiple medications as well as non-pharmacologic interventions. As such, each patient's medication regimen must always be considered in the full context of his/her overall clinical status.
- The role of the prescriber is to evaluate, diagnose, and treat patients. This includes helping define the nature and severity of symptoms and identifying whether the situation constitutes a problem that requires intervention. It also includes periodically reviewing all medications and monitoring for continued need based on known diagnoses or problems, and monitoring for possible adverse drug reactions as well as the patient's overall goals of care.
- Physicians should help staff and families identify risks relevant to any medication and relevant parameters for monitoring medications and reassess the patient's response to treatment over time, including risk, benefits, and relative efficacy.
- Medication review should be comprehensive and not limited to particular segments of the drug spectrum.

2. In non-emergent situations, non-pharmacologic interventions should be considered first.

- Non-pharmacologic interventions may be successful by addressing underlying causes and factors contributing to behavioral symptoms.
- The practitioner's evaluation of behavioral symptoms should include a detailed review of a patient's symptom history and a careful assessment of the circumstances in which problematic behavior occurs as a basis for both medication treatment and non-pharmacological interventions.
- Abnormal behavior is often an expression of unmet needs or symptoms, including pain, constipation, negative responses to noise, or interaction with other individuals. Considerable effort needs to be expended to identify the patient's unstated symptoms or needs, since many agitated dementia patients will not be able to express them.

3. Sometimes it is appropriate and necessary to use antipsychotic medications for patients with dementia-related behaviors.

- Medication use may be considered when there is a suspected underlying cause of problematic behavioral symptoms that may be amenable to a targeted medication intervention or when non-pharmacologic approaches have not effectively modified the patient's behavior. Medications may be more appropriate when behavioral or psychotic symptoms are causing significant distress to the patient or pose a threat to the patient, staff, or others.
- Physicians practicing in the long-term care setting recognize that many medications are used off-label, with such use considered to be within the standard of care in most cases. The mere use of a medication off-label, including antipsychotics, does not by itself constitute inappropriate use.
- The off-label use of antipsychotic medications may be medically justifiable depending on the relative benefits and risks for the patient; that is, if the medication is effective in addressing problematic symptoms and does not cause excessive or unacceptable risks, side effects, or complications.
- As with all medications with major ("black box") warnings, there should be documented justification for initiating and continuing antipsychotic medications periodically as well as documentation of discussions about risks and benefits with the patient or substitute decision maker. The documentation should indicate that informed consent for the use of these medications has been obtained, and that they are being utilized for an "off-label" indication.
- There is (some) data to support the use of other medications for nonspecific agitation (e.g., cholinesterase inhibitors, memantine, mood stabilizers or antidepressants), clinicians must decide based on the severity of symptoms (e.g., potential harm to patient or caregivers), immediacy of the situation and adverse effect profile which medication is most appropriate for each individual patient. A trial of one or more of these treatments may be appropriate especially when psychotic symptoms such as hallucinations or delusions are absent.
- Some atypical antipsychotic medications have some Food and Drug Administration (FDA)-approved indications for conditions other than psychosis, including some forms of depression.
- All antipsychotic medications are FDA-approved for the treatment of psychotic disorders such as schizophrenia, and for the treatment of bipolar disorder with psychosis. These medications should not be withheld from patients with these diagnoses, but should also be prescribed judiciously, and—when medically indicated—with input from a mental health professional.

4. The therapeutic goal of the use of antipsychotic medications is to treat psychosis versus nonspecific agitation or other forms of lesser distress, and thus improve the patient's quality of life.

- Treatment of psychosis includes identifying and treating underlying causes, ensuring safety, reducing distress, and supporting the patient's functioning.
- These drugs when used in appropriate patients with dementia-related psychotic symptoms (versus repetition, chanting, agitation) have actually improved rather than worsened the quality of life of those individuals treated. The goal should always be to optimize quality of life, not to disable the person.
- Although acute psychotic symptoms are unlikely to respond adequately to non-pharmacologic interventions alone, the implementation of non-pharmacologic approaches may permit the use of lower doses of antipsychotic medications.

5. The goal is not to sedate or restrain.

- The prescribing of antipsychotic medications for simple agitation, confusion, delirium, and aggression should not occur without thoughtful evaluation of whether there is a target symptom that is likely to respond to an antipsychotic agent, and with consideration of the risks involved.
- The goal of using antipsychotic medications, as with any psychopharmacological medications, is to address behavioral or mood symptoms and/or their underlying causes while preserving or enhancing

function and quality of life. If the medication causes excessive or unwanted sedation or impairs function and diminishes quality of life, then its use may not be appropriate and should be reconsidered.
- Prescribing an antipsychotic medication, except in an emergency, should be done only after an attempt to determine if there are other environmental or medical factors causing these types of symptoms, and after taking appropriate actions when other causes are suspected (e.g., treating a urinary tract infection or providing medication for arthritis pain).

6. Interventions need to be monitored and reviewed periodically with consideration of appropriate Gradual Dose Reductions.

- As with any medications, the ongoing indication and effectiveness of antipsychotic medications should be reviewed. Symptoms may improve or resolve because of, or despite, the continued use of medications. Often, it is necessary to taper or stop a medication in order to gauge whether it is still needed, and if so, still needed in the same dose.
- State Operations Manual surveyor guidelines for F329 (Unnecessary Medications) are based on a comprehensive assessment of the patient. The facility must ensure that patients who have not used antipsychotic drugs are not given these drugs unless antipsychotic drug therapy is necessary to treat a specific condition as diagnosed and documented in the clinical record.
- Patients who use antipsychotic medications are to receive gradual dose reductions on a periodic basis, unless clinically contraindicated, and behavioral interventions should be implemented when appropriate as part of the effort to discontinue these medications.

7. AMDA's Educational Messaging is consistent with current regulations.
- The F329 (Unnecessary Medications) surveyor guidelines, including those related to antipsychotic medications, were updated in 2006.
- F329 emphasizes the clinical problem-solving and decision-making process as the foundation of all prescribing decisions.
- Table 1 in F329 updated earlier antipsychotic medication guidelines.
- The updates distinguish the acute from the enduring use of these medications.
- Medication doses listed in those guidelines are meant to be used as follows: if the dose of a specific medication is greater than the indicated dose, the facility and prescriber are expected to document additional or more detailed rationale for why the higher dose is necessary and that they are monitoring for adverse consequences.
- Nothing about the guidance sets absolute limits on what doses or medications can be used. However, it does direct surveyors to request that facilities show the basis for the initiation and continued use of such medications.

8. AMDA is committed to educating long term care providers and collaborating with state surveyor agencies to ensure appropriate implementation of F Tags F501 (Medical Director) and F329 (Unnecessary Medications).
- Education should focus attention on the interdisciplinary team's consistent and appropriate use of care processes to guide selection and ongoing use of antipsychotic medications.
- Education should help staff become comfortable with caring for persons with dementia. Educational efforts should emphasize the importance of having an active antipsychotic medication usage tracking method which includes root cause analysis, concomitant non-pharmacologic methods, response to all interventions and gradual dose reduction. Such programs can help provide the best resident care and avoid inappropriate medication usage.

- AMDA serves on a technical expert panel that is implementing Section 6121 of the Affordable Care Act. The project is aimed at developing training products for nurses' aides in the area of provision of care for persons with dementia.
- AMDA needs to provide education that will fill professional practice gaps. A practice gap is a lack of understanding and a lack of knowledge to intervene concerning a practice.

PARTNERSHIP TO IMPROVE DEMENTIA CARE IN NURSING HOMES
*Questions to Consider in Interdisciplinary Team Review of Individual Dementia Care Cases

- If the behavioral symptoms represent a change or worsening, was a medical work up performed to rule out underlying medical or physical causes of the behaviors, if appropriate?
- Were current medications considered as potential causes of the behaviors (i.e., those with significant anticholinergic or other side effects)?
- If a medical cause (e.g., UTI) was identified, was treatment (if indicated) initiated in a timely manner?
- If medical causes were ruled out, did the staff attempt to establish the root causes of the behaviors, using a careful and systematic process and individualized knowledge about the resident when possible? Were family caregivers or others who knew the resident prior to his/her dementia consulted about prior life patterns, responses to stress, etc.?
- Was the initial clinical indication for the medication valid?
- Were non-pharmacologic, person-centered interventions tried before medications (other than in an emergency)? Were the results documented?

- Were specific target behaviors identified and desired outcomes related to those behaviors documented? Were caregivers aware of the target behaviors and desired results of the medication?
- Was the resident or appropriate legal representative consulted about the decision to use an antipsychotic medication and was that discussion documented?
- If a drug is continued for more than a few weeks, is the original clinical indication still valid (are the behaviors still present)?
- Is appropriate monitoring in place and is the team aware of the potential side effects?
- If new symptoms or changes in condition occurred after an antipsychotic medication was started, was medication use considered as a potential cause of a change or symptom?
- If on a medication, did the pharmacist perform a medication regimen review and identify related signs and symptoms, or did the staff inform the pharmacist if symptoms occurred after the last pharmacist visit?

Unexplained Variation Across US Nursing Homes in Antipsychotic Prescribing Rates

Yong Chen, MD, MHS; Becky A. Briesacher, PhD; Terry S. Field, DSc; Jennifer Tjia, MD; Denys T. Lau, PhD; Jerry H. Gurwitz, MD

Background: Serious safety concerns related to the use of antipsychotics have not decreased the prescribing of these agents to nursing home (NH) residents. We assessed the extent to which resident clinical characteristics and institutional prescribing practice were associated with antipsychotic prescribing.

Methods: Antipsychotic prescribing was assessed for a nationwide, cross-sectional population of 16 586 newly admitted NH residents in 2006. We computed facility-level antipsychotic rates based on the previous year's (2005) prescribing patterns. Poisson regressions with generalized estimating equations were used to identify the likelihood of resident-level antipsychotic medication use in 2006, given 2005 facility-level prescribing pattern and NH resident indication for antipsychotic therapy (psychosis, dementia, and behavioral disturbance).

Results: More than 29% (n=4818) of study residents received at least 1 antipsychotic medication in 2006. Of the antipsychotic medication users, 32% (n=1545) had no identified clinical indication for this therapy. Residents entering NHs with the highest facility-level antipsychotic rates were 1.37 times more likely to receive antipsychotics relative to those entering the lowest prescribing rate NHs, after adjusting for potential clinical indications (risk ratio [RR], 1.37; 95% confidence interval [CI], 1.24-1.51). The elevated risk associated with facility-level prescribing rates was apparent for only NH residents with dementia but no psychosis (RR, 1.40; 95% CI, 1.23-1.59) and residents without dementia or psychosis (RR, 1.54; 95% CI, 1.24-1.91).

Conclusions: The NH antipsychotic prescribing rate was independently associated with the use of antipsychotics in NH residents. Future research is needed to determine why such a prescribing culture exists and whether it could result in adverse health consequences.

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Nearly 1 in 3 nursing home (NH) residents in the United States received antipsychotic drugs in 2007,[1] which is the highest reported level of use in more than a decade. Serious safety concerns related to these agents are increasing.[2-4] In 2005, the Food and Drug Administration (FDA) issued warnings of excess mortality associated with the use of these antipsychotic agents for behavioral symptoms in elderly patients with dementia.[2] Furthermore, a large National Institutes of Health (NIH)–sponsored clinical trial recently concluded that the adverse effects of atypical antipsychotics offset their advantages in older adults with Alzheimer disease (AD).[5]

See also pages 83 and 96

Recently published data from Ontario, Canada, indicate that there is wide variation in the proportion of NH residents using antipsychotics.[6] This prescribing variation may reflect differences in the patient case mix and the prevalence of diagnoses of psychoses or dementia with severe behavior problems. Alternatively, antipsychotic medication use may also be driven by NHs' facility-level antipsychotic prescribing rates.[6] Such prescribing patterns may be considered a "visible artifact of deeper cognitive processes shared by organizational members,"[7(p90)] and perhaps indicate an institutional prescribing culture. Although previous work supports the role of facility-level factors in resident-level prescribing in Canada,[6] the extent to which this exists in the United States is unclear.

The objective of the present study is to examine the association between facility-level antipsychotic rates and the use of antipsychotics among NH residents in the United States. We hypothesize that residents who enter NHs with

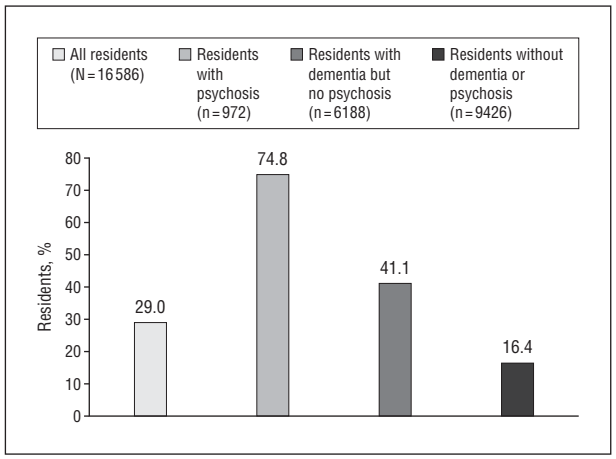

Figure. Use of antipsychotic medications in 2006.

high facility-level antipsychotic prescribing rates would be more likely to receive antipsychotic medications, independent of their clinical indications for this treatment. Findings from this study will help inform policies to target NHs with high antipsychotic prescribing rates.

METHODS

DATA

This study used 2 merged data sources: (1) a nationwide database of 2005-2006 NH prescription drug dispensing records and (2) the 2006 Minimum Data Set (MDS). Both data sets were previously described in detail.[8] The prescription data come from the pharmacy claims of over 2.5 million individuals living in approximately 16 000 NHs from across 48 states. Pharmacy claims include a variety of prescription drug plans (including private insurance, Medicaid, and Medicare Part D) and those without insurance coverage for drugs. The drug dispensing data include all medications prescribed and administered to NH residents, including over-the-counter drugs and drugs administered on an as-needed basis. Data elements include the National Drug Code, dispensing date, and the state where the NH was located. Linkable MDS records were available for approximately one-third of individuals with prescription data. The MDS is a federally mandated health assessment tool used in US NHs that captures over 300 items about a residents' physical and cognitive functioning. Full assessments occur on admission, when a significant change in clinical status occurs, and annually. Most elements of the MDS demonstrate excellent to good reliability.[9,10]

STUDY SAMPLE

The sampling frame for this study was 66 181 NH residents newly admitted in 2006 who had at least 1 drug dispensing record. We excluded 46 610 short-stay residents, defined as individuals having an NH stay shorter than 3 consecutive months, because previous research has shown that these individuals differ from long-stay residents.[11,12] Furthermore, we excluded residents living in small NHs with fewer than 5 residents (n = 2985). The final sample size was 16 586 residents admitted to 1257 NHs.

NH FACILITY–LEVEL ANTIPSYCHOTIC PRESCRIBING RATE AND CHARACTERISTICS

To measure an NH facility–level antipsychotic prescribing rate, we adopted a method developed by Rochon et al.[6] For each NH with newly admitted residents in 2006, we examined the records of prescription drugs dispensed for all residents in that NH in the previous year (ie, 2005). We used 2005 data for this calculation to establish a facility-level antipsychotic prescribing rate independent of the actual use of antipsychotic drugs for newly admitted residents. This also established the temporal relationship between the 2 variables. The facility-level antipsychotic prescribing rate was defined as the proportion of long-stay residents in the NH receiving at least 1 antipsychotic prescription in 2005. For 1473 residents with stays in multiple NHs, we used their first NH stay for this analysis. Based on the distribution of antipsychotic prescribing rates, NHs were categorized into quintiles (quintile 1 to quintile 5 [hereafter, Q1 to Q5]) of facility prescribing rates. As a sensitivity analysis, we recalculated the antipsychotic rates including short-stay residents and found that the quintile assignments remained substantially similar. (Data not shown but available on request from the corresponding author.)

Nursing home characteristics included number of long-stay residents in the NH during 2005 and location as categorized by US census region.

RESIDENT CHARACTERISTICS

Resident characteristics were drawn from the first MDS admission assessment in 2006. Demographics included age, sex, marital status, and race/ethnicity. We calculated the MDS-Changes in Health, End-stage disease and Symptoms and Signs (CHESS) score to measure frailty of the resident.[13] The CHESS score, ranging from 0 (no frailty) to 5 (high frailty), is a strong predictor of mortality and health instability in NH residents.[13] Severity of behavioral problems was measured by the Behavioral Index, which is based on the frequency and number of behaviors including wandering and being verbally or physically abusive and socially inappropriate.[14-16] Ranging from 0 to 2, the Behavioral Index was categorized into normal/mild (0 or 1) and moderate/severe (2) behavioral problems. Cognitive impairment was assessed by the Cognitive Performance Scale (CPS) and categorized as minimal (0-1), moderate (2-3), and severe (4-6).[17] The CPS has been shown to be highly correlated with the Mini-Mental State Examination (MMSE).[9,17] Residents were classified as having dementia if there was a diagnosis of AD or dementia other than AD or if they received a prescription for an acetyl cholinesterase inhibitor, an ergot alkaloid, or noncompetitive *N*-methyl D-aspartate receptor antagonist (ie, memantine). Based on a method described by Oliveria et al,[18] we defined residents as having psychoses if they were diagnosed as having schizophrenia, schizoaffective disorder, mood disorder with psychotic features, psychotic symptoms accounted for by a substance, or current major depressive episode with psychotic symptoms of hallucinations or delusions. Because behavioral components were used to compute variables such as the Behavioral Index, CPS, and dementia, it was possible that they were correlated. We performed Pearson correlation coefficient analysis to examine the correlation among the 3 variables and found that the highest correlation coefficient was lower than 0.45. Therefore, all 3 variables were included in the analysis.

STATISTICAL ANALYSES

Descriptive statistics were performed to examine the distribution of the facility and individual characteristics among the fa-

Table 1. Characteristics of Nursing Homes by Facility-Level Antipsychotic Prescribing Rate

Characteristic	Nursing Homes, No. (%)						
		Facility-Level Antipsychotic Prescribing Rate Quintile[a]					
	Overall	Q1 (0-24.3)	Q2 (24.4-29.0)	Q3 (30.0-35.6)	Q4 (35.7-43.7)	Q5 (43.8-100)	*P* Value
Facility	1257 (100)	240 (19.1)	263 (20.9)	258 (20.5)	255 (20.3)	241 (19.2)	
US census region[b]							
South	400 (31.9)	49 (20.5)	62 (23.8)	91 (35.3)	96 (37.8)	102 (42.5)	<.001
West	161 (12.9)	44 (18.4)	46 (17.6)	29 (11.2)	24 (9.4)	18 (7.5)	
Midwest	491 (39.2)	115 (48.1)	110 (42.1)	93 (36.0)	84 (33.1)	89 (37.1)	
Northeast	200 (16.0)	31 (13.0)	43 (16.5)	45 (17.4)	50 (19.7)	31 (12.9)	
Size, No. of residents							
5-49	71 (5.6)	27 (11.3)	10 (3.8)	11 (4.3)	9 (3.5)	14 (5.8)	<.001
50-99	194 (15.4)	41 (17.1)	40 (15.2)	29 (11.2)	41 (16.1)	43 (17.8)	
100-249	552 (43.9)	98 (40.8)	95 (36.1)	115 (44.6)	114 (44.7)	130 (53.9)	
250-499	314 (25.0)	50 (20.8)	80 (30.4)	67 (26.0)	72 (28.2)	45 (18.7)	
≥500	126 (10.0)	24 (10.0)	38 (14.4)	36 (14.0)	19 (7.5)	9 (3.7)	

[a] Facility-level antipsychotic prescribing rates quintiles were based on all long-stay residents in 2005.
[b] Cells may not add up to 1257 (100%) and quintile facility totals because of missing data.

cility-level antipsychotic quintiles and between individuals with and without antipsychotic therapy. χ^2 Tests were used to compare proportions.

Risk ratios (RRs) of antipsychotic therapy for calendar year 2006 were estimated using Poisson regression and generalized estimating equations. This modeling approach does not require a rare disease assumption, provides valid confidence intervals (CIs) using robust estimation,[19] and adjusts for clustering of residents within a facility. Unadjusted (model 1) and adjusted (models 2-4) models were conducted in the overall population and in the following mutually exclusive clinical subgroups indicated for antipsychotic therapy: (1) residents with psychosis, (2) residents with dementia and no psychosis, and (3) residents without psychosis or dementia. The first 2 groups were considered potential clinical indication groups, while the last was considered as the nonindication group. Adjusted models included successive sets of additional covariates: model 2, facility characteristics (facility size and region); model 3, resident characteristics, including demographics (age, sex, marital status, and race/ethnicity) and general health status; and model 4, antipsychotic indications (Behavioral Index, indicator of dementia, and indicator of psychosis). Note that model 4 was defined individually for each clinical subgroup. We used such a stepwise approach to (1) separate the effect of NH characteristics from resident characteristics and (2) separate the effect of antipsychotic indications from nonantipsychotic indications.

STATA version 10.0 software (StataCorp, College Station, Texas) was used to conduct all statistical analyses, and $P<.05$ was considered statistically significant. The institutional review board of the University of Massachusetts Medical School exempted this research from review.

RESULTS

We identified 16 586 long-stay NH residents who were newly admitted to 1257 NHs in 2006. The facility-level antipsychotic prescribing rates of these NHs in the preceding year ranged from 0% to 24.4% in Q1 to 43.8% to 100% in Q5. In the sample, 972 residents had psychosis, 6188 had dementia but no psychosis, and 9426 had neither psychosis nor dementia. Approximately 29% (n=4818) of all residents received at least 1 antipsychotic medication in 2006. Residents with psychosis had the highest level of use with 74.8% (n=727) using at least 1 antipsychotic, followed by residents with dementia and no psychosis (41.1% [n=2546]) and then residents without dementia or psychosis (16.4% [n=1545]) (**Figure**). Overall, among the 4818 antipsychotic medication users, 1545 (32%) did not have any clinical indication.

Table 1 describes the study NHs by their antipsychotic prescribing rates quintiles in 2005. Comparing Q5 and Q1 NHs, we found that a higher proportion of Q5 NHs were more likely to be located in the South and have fewer than 250 residents. A higher proportion of Q1 NHs were located in the Midwest and had more than 250 residents.

Table 2 describes the study population by quintiles of facility-level antipsychotic prescribing rates. Compared with residents in Q5 NHs, those in Q1 NHs tended to be older (age >75 years: 75% vs 59%; $P<.001$), female (69.4% vs 60.9%; $P<.001$), and white (85% vs 71.9%; $P<.001$). More residents in Q1 NHs were frail (CHESS score, 3-5: 24.7% vs 14.0%; $P<.001$) and had a higher CPS score (CPS score, 0-1: 39.2% vs 31.4%; $P<.001$) than residents in Q5 NHs. More residents in Q5 NHs had moderate or severe behavioral problems (Behavioral Index, moderate/severe: 23.5% vs 12.6%; $P<.001$), dementia (52.3% vs 41.4%; $P<.001$), and psychosis (10.3% vs 4.0%; $P<.001$) compared with those in Q1 NHs.

Table 3 gives the distribution of individual characteristics between antipsychotic medication users and nonusers. Residents who were prescribed antipsychotic medications were younger (age ≤65 years: 13.7% vs 10.2% [$P<.001$]; and 66-75 years: 19.8% vs 18.8% [$P<.001$]), male (37.6% vs 34.1%; $P<.001$), and less frail (CHESS score of 0: 24.9% vs 17.6%; $P<.001$) compared with those who were not using antipsychotics. Antipsychotics tended to be given to residents with moderate and severe behavioral problems (32.3% vs 8.9%; $P<.001$), dementia (68.8% vs 36.9%; $P<.001$), and psychosis (15.1% vs 2.1%; $P<.001$).

The association between resident use of antipsychotics and facility-level prescribing rates in the full sample

Table 2. Facility-Level Antipsychotic Prescribing Rate Quintile by Resident Characteristics[a]

Characteristic	Nursing Homes, No. (%)						
		Facility-Level Antipsychotic Prescribing Rate Quintile[b]					
	Overall	Q1 (0-24.3)	Q2 (24.4-29.9)	Q3 (30.0-35.6)	Q4 (35.7-43.7)	Q5 (43.8-100)	*P* Value
Residents	16 586 (100)	2696 (16.3)	3788 (22.8)	3617 (21.8)	3798 (22.9)	2687 (16.2)	
Age, y							
≤65	1860 (11.2)	204 (7.6)	361 (9.5)	357 (9.9)	457 (12.0)	481 (17.9)	<.001
66-75	3166 (19.1)	460 (17.1)	682 (18.0)	688 (19.0)	717 (18.9)	619 (23.0)	
76-85	6681 (40.3)	1128 (41.8)	1553 (41.0)	1453 (40.2)	1561 (41.1)	986 (36.7)	
>85	4879 (29.4)	904 (33.5)	1192 (31.5)	1119 (30.9)	1063 (28.0)	601 (22.4)	
Sex							
Male	5812 (35.1)	824 (30.6)	1317 (34.8)	1293 (35.8)	1331 (35.1)	1048 (39.1)	<.001
Female	10 759 (64.9)	1869 (69.4)	2469 (65.2)	2324 (64.3)	2464 (64.9)	1632 (60.9)	
Marital status							
Never married	1403 (8.6)	191 (7.1)	305 (8.1)	300 (8.3)	347 (9.1)	260 (9.7)	.004
Married	4278 (26.2)	746 (27.7)	996 (26.3)	904 (25.0)	934 (24.6)	698 (26.0)	
Other	10 905 (65.7)	1759 (65.2)	2487 (65.6)	2413 (66.7)	2517 (66.3)	1729 (64.3)	
Race/ethnicity							
White	12 889 (78.1)	2267 (85.0)	3051 (80.8)	2739 (76.3)	2902 (76.8)	1930 (71.9)	<.001
Black	2182 (13.2)	224 (8.4)	443 (11.7)	516 (14.4)	523 (13.9)	476 (17.7)	
Hispanic	1090 (6.6)	109 (4.1)	185 (4.9)	268 (7.5)	276 (7.3)	252 (9.4)	
Other	336 (2.0)	67 (2.5)	99 (2.6)	68 (1.9)	76 (2.0)	26 (1.0)	
CHESS score							
0	3270 (19.7)	338 (12.5)	532 (14.0)	653 (18.1)	828 (21.8)	919 (34.2)	<.001
1	4952 (29.9)	745 (27.6)	1095 (28.9)	1087 (30.1)	1204 (31.7)	821 (30.6)	
2	4894 (29.5)	946 (35.1)	1269 (33.5)	1094 (30.2)	1015 (26.7)	570 (21.2)	
3-5	3470 (20.9)	667 (24.7)	892 (23.5)	783 (21.6)	751 (19.8)	377 (14.0)	
CPS score							
0-1	6021 (36.3)	1057 (39.2)	1473 (38.9)	1340 (37.1)	1308 (34.4)	843 (31.4)	<.001
2-3	7923 (47.8)	1303 (48.4)	1714 (45.3)	1685 (46.6)	1847 (48.6)	1374 (51.2)	
4-6	2636 (15.9)	334 (12.4)	599 (15.8)	591 (16.3)	643 (16.9)	469 (17.5)	
Behavioral Index							
Normal/mild	13 966 (84.3)	2353 (87.4)	3343 (88.3)	3080 (85.2)	3140 (82.8)	2050 (76.5)	<.001
Moderate/severe	2597 (15.7)	340 (12.6)	441 (11.7)	535 (14.8)	651 (17.2)	630 (23.5)	
Dementia							
No	8927 (53.8)	1581 (58.6)	2187 (57.7)	1940 (53.6)	1938 (51.0)	1281 (47.7)	<.001
Yes	7659 (46.2)	1115 (41.4)	1601 (42.3)	1677 (46.4)	1860 (49.0)	1406 (52.3)	
Psychosis							
No	15 614 (94.1)	2589 (96.0)	3655 (96.5)	3443 (95.2)	3518 (92.6)	2409 (89.7)	<.001
Yes	972 (5.9)	107 (4.0)	133 (3.5)	174 (4.8)	280 (7.4)	278 (10.3)	

Abbreviations: CHESS, Changes in Health, End-stage disease and Symptoms and Signs score; CPS, Cognitive Performance Scale.

[a] Data are given as number (percentage) unless otherwise indicated. Number of residents may not add up to 16 586 (100%) and quintile resident totals in each characteristic because of missing data.

[b] Facility-level antipsychotic prescribing rate quintile was based on all long-stay residents in 2005.

is given in **Table 4**. Residents in Q5 NHs had double the risk ratio (RR) of receiving antipsychotics (model 1: RR, 2.00; 95% confidence interval [CI], 1.78-2.24) compared with residents in Q1 NHs. Adjusting for NH characteristics did not change the magnitude of the association (Q5 vs Q1, model 2: RR, 1.95; 95% CI, 1.73-2.20). Adjusting for demographics and health status, reduced the RR (Q5 vs Q1 model 3: RR, 1.60; 95% CI, 1.44-1.78). The RR was further reduced after controlling for potential indication of antipsychotics; however, compared with residents in Q1 NHs, those in Q5 NHs still had higher risk of being prescribed antipsychotics (model 4: RR, 1.37; 95% CI, 1.24-1.51).

Table 4 also shows that antipsychotic medication use across the quintiles of facility-level prescribing rates varied by clinical subgroups. Among the residents with psychosis, antipsychotic medication use did not vary significantly across quintiles in the full model. After adjusting for all covariate sets (model 4 for psychosis), the RR for Q5 to Q1 NHs was 1.14 (95% CI, 0.98-1.33).

However, facility-level prescribing quintile did predict use of antipsychotics for the 2 other clinical subgroups. For residents with dementia and no psychosis, those residing in Q5 NHs were more likely to be prescribed antipsychotics (model 1: RR, 1.65; 95% CI, 1.45-1.88) relative to those in Q1 NHs, and the magnitude and significance of RR changed little after adjusting for facility characteristics (model 2: RR, 1.58; 95% CI, 1.39-1.80) and then for demographics and health status (model 3: RR, 1.50; 95% CI, 1.30-1.71). After adjusting for Behavioral Index, the RR was still statistically significant (model 4: RR, 1.40; 95% CI, 1.23-1.59).

Among the residents without psychosis or dementia, facility-level prescribing quintile was significantly asso-

ciated with use of antipsychotics (Q5 vs Q1, model 1: RR, 1.79; 95% CI, 1.44-2.21). After full adjustment, the association remained statistically significant (Q5 vs Q1, model 4: RR, 1.54; 95% CI, 1.24-1.91).

COMMENT

This study provides evidence of a facility-level variation in the prescribing of antipsychotics in US NHs. We found that the likelihood of a newly admitted NH resident to receive an antipsychotic medication was strongly and independently related to the facility-level antipsychotic prescribing rate, even after adjustment for clinical and sociodemographic characteristics. Residents newly admitted to NHs with the highest prescribing rates were 1.37 times more likely to receive an antipsychotic medication relative to those in the NHs with the lowest prescribing rates. The influence of the facility-level prescribing rate was most apparent in residents without psychosis, who have the weakest indication for antipsychotic medication use.

Another important finding in this study is the high use of antipsychotics in NHs in the period after the 2005 FDA mortality warnings for antipsychotic agents. Our finding that more than 29% of newly admitted NH residents received antipsychotic medications in 2006 is corroborated by other sources,[3] including a sample of 8 states in 2006 reporting antipsychotic prevalence of 27.6% among NH residents[20] and a sample from Canada.[6]

The high use of antipsychotics may reflect a growing proportion of NH residents diagnosed as having psychoses.[20] However, residents diagnosed as having schizophrenia, bipolar disorder, or aggressive behavioral symptoms of dementia accounted for only a small proportion of antipsychotic medication use.[20] In addition, we found that 16.4% of residents who had no clinical indication for antipsychotic therapy (no psychoses and no dementia) received antipsychotic medications. Ad hoc analyses to isolate the role of behavior on the use of antipsychotics showed that the risk of receiving antipsychotics steadily increased with higher facility-level prescribing rates but only for residents with dementia and normal/mild behavior problems. In contrast, this association was not evident for residents with dementia and moderate/severe behavior problems (data not shown but available on request from the corresponding author). This suggests that managing behavioral problems plays an important role in facility-level decisions about antipsychotic prescribing. We also compared antipsychotic rates by payment status and found dual-eligible residents were more likely than Medicare-only residents to receive an antipsychotic medication (RR, 1.2; 95% CI, 1.15-2.56). Race/ethnicity was significantly associated with antipsychotics use. Compared with white residents, black residents were 11% less likely to receive an antipsychotic medication. In residents without psychosis and dementia, black and Hispanic residents were 30% and 22%, respectively, less likely than white residents to be prescribed an antipsychotic medication.

Our study suggests that facility-level factors such as organizational culture may play a role in medication prescribing and is consistent with previous studies supporting the impact of culture on the use of antipsychotics in Canada[6] and feeding tubes for NH residents with dementia.[21] There has been a growing interest in the role of organizational culture in medication prescribing in NHs.[7,22,23] Organizational culture is a broad concept that encompasses the shared values, beliefs, and assumptions of a group or members within a group, such as a NH and the NH's clinicians and staff.[7] The perceptions shared by individuals working within a NH may exhibit itself as a facility-level preference for certain therapeutic modalities. Organizational culture may be particularly important in the use of antipsychotics in NHs since prescribing decisions often occur in NHs without direct contact between the prescriber and resident.

The study was subject to limitations. First, this is a cross-sectional study, thus we are not able to draw conclusions about causal relationships. Second, the data come from a single long-term care pharmacy provider with a

Table 3. Resident-Level Use of Antipsychotics by Resident Characteristics

Characteristic	Resident-Level Use of Antipsychotics, No. (%)		*P* Value
	No	Yes	
Residents	11 768 (71.0)	4818 (29.0)	
Age, y			
≤65	1198 (10.2)	662 (13.7)	<.001
66-75	2213 (18.8)	953 (19.8)	
76-85	4706 (40.0)	1975 (41.0)	
>85	3651 (31.0)	1228 (25.5)	
Sex			
Male	4006 (34.1)	1807 (37.6)	<.001
Female	7753 (65.9)	3005 (62.5)	
Marital status			
Never married	946 (8.0)	457 (9.5)	<.001
Married	2967 (25.2)	1311 (27.2)	
Other	7855 (66.8)	3050 (63.3)	
Race/ethnicity			
White	9163 (78.3)	3726 (77.7)	<.05
Black	1545 (13.2)	637 (13.3)	
Hispanic	739 (6.3)	351 (7.3)	
Other	253 (2.2)	83 (1.7)	
CHESS score			
0	2069 (17.6)	1201 (24.9)	<.001
1	3471 (29.5)	1481 (30.7)	
2	3636 (30.9)	1258 (26.1)	
3-5	2592 (22.0)	878 (18.2)	
CPS score[a]			
0-1	5071 (43.1)	950 (19.7)	<.001
2-3	5156 (43.8)	2767 (57.5)	
4-6	1538 (13.1)	1098 (22.8)	
Behavioral Index			
Normal/mild	10 706 (91.1)	3260 (67.7)	<.001
Moderate/severe	1041 (8.9)	1556 (32.3)	
Dementia			
No	7422 (63.1)	1505 (31.2)	<.001
Yes	4346 (36.9)	3313 (68.8)	
Psychosis			
No	11 523 (97.9)	4091 (84.9)	<.001
Yes	245 (2.1)	727 (15.1)	

Abbreviations: CHESS, Changes in Health, End-stage disease and Symptoms and Signs score; CPS, Cognitive Performance Scale.
[a] CPS score was grouped to 0 to 1 and 2 to 6 for χ^2 test because of small number of residents with a CPS score of 4 to 6.

Table 4. Adjusted Risk Ratios of Resident-Level Use of Antipsychotics by Facility-Level Antipsychotic Prescribing Rate, According to Resident Clinical Subgroups[a]

Model	Relative Risk (95% Confidence Interval)			
	All Residents	Residents With Psychosis	Residents With Dementia and No Psychosis	Residents Without Dementia or Psychosis
Model 1: only facility-level antipsychotic prescribing rate quintiles				
Q1	1 [Reference]	1 [Reference]	1 [Reference]	1 [Reference]
Q2	1.11 (0.99-1.25)	1.14 (0.94-1.37)	1.10 (0.97-1.25)	1.10 (0.90-1.35)
Q3	1.35 (1.20-1.51)	1.31 (1.11-1.55)	1.20 (1.06-1.36)	1.33 (1.08-1.64)
Q4	1.48 (1.33-1.66)	1.07 (0.89-1.28)	1.31 (1.15-1.49)	1.48 (1.21-1.80)
Q5	2.00 (1.78-2.24)	1.28 (1.08-1.50)	1.65 (1.45-1.88)	1.79 (1.44-2.21)
Model 2: model 1 + facility characteristics[b]				
Q1	1 [Reference]	1 [Reference]	1 [Reference]	1 [Reference]
Q2	1.12 (0.99-1.25)	1.13 (0.95-1.35)	1.09 (0.95-1.23)	1.10 (0.90-1.35)
Q3	1.33 (1.19-1.50)	1.27 (1.08-1.50)	1.16 (1.02-1.32)	1.35 (1.09-1.67)
Q4	1.46 (1.30-1.63)	1.06 (0.88-1.27)	1.26 (1.10-1.43)	1.51 (1.23-1.85)
Q5	1.95 (1.73-2.20)	1.25 (1.06-1.47)	1.58 (1.39-1.80)	1.84 (1.46-2.31)
Model 3: model 2 + demographics + health status[c]				
Q1	1 [Reference]	1 [Reference]	1 [Reference]	1 [Reference]
Q2	1.11 (1.00-1.24)	1.13 (0.95-1.34)	1.07 (0.94-1.22)	1.07 (0.87-1.30)
Q3	1.26 (1.13-1.40)	1.23 (1.05-1.44)	1.14 (1.00-1.29)	1.28 (1.04-1.57)
Q4	1.34 (1.20-1.49)	1.03 (0.86-1.22)	1.23 (1.08-1.40)	1.35 (1.10-1.65)
Q5	1.60 (1.44-1.78)	1.16 (0.99-1.36)	1.50 (1.30-1.71)	1.55 (1.25-1.92)
Model 4: model 3 + indication of antipsychotics (defined separately in the 3 clinical subgroups)[d]				
Q1	1 [Reference]	1 [Reference]	1 [Reference]	1 [Reference]
Q2	1.10 (0.99-1.21)	1.13 (0.96-1.34)	1.07 (0.95-1.22)	1.08 (0.89-1.32)
Q3	1.19 (1.07-1.31)	1.24 (1.06-1.44)	1.12 (0.99-1.27)	1.26 (1.03-1.55)
Q4	1.19 (1.08-1.32)	1.02 (0.86-1.21)	1.19 (1.05-1.35)	1.36 (1.11-1.67)
Q5	1.37 (1.24-1.51)	1.14 (0.98-1.33)	1.40 (1.23-1.59)	1.54 (1.24-1.91)

[a] Relative risks for other covariates were not shown but are available on request from the corresponding author.
[b] Model 2: facility characteristics (nursing home size, region).
[c] Model 3: demographics (age, sex, race/ethnicity, marital status) + health status (CHESS [Changes in Health, End-stage disease, and Symptoms and Signs] and CPS [Cognitive Performance Scale] scores).
[d] Model 4 (all residents): indication of antipsychotics (Behavioral Index, dementia, or psychosis); model 4 (psychosis): indication of antipsychotics (Behavioral Index or dementia); model 4 (dementia without psychosis): indication of antipsychotics (Behavioral Index); model 4 (no dementia and psychosis): indication of antipsychotics (Behavioral Index).

large nationwide sample; however, our results may not be generalized to all Medicare enrollees. A comparison of the geographic residence of our study sample to that of the NH residents in the December 2006 Center for Medicare and Medicaid Services Online Survey Certification And Reporting (OSCAR) Data survey shows a similar distribution (Northeast, 24% vs 23%; Midwest, 36% vs 29%; South, 28% vs 34%; and West, 11% vs 14%).[24] Third, we have excluded NHs with fewer than 5 residents in 2005 because their antipsychotic rates were unstable owing to the small number of residents. We further excluded short-stay residents because of their distinct characteristics from long-stay residents. Limiting our study sample therefore prevents us from extending the interpretation of our findings to smaller facilities. Fourth, the prevalence of psychoses in our sample was lower compared with that found in another study using medical records.[18] Thus, we may have underestimated the prevalence of psychoses in this sample. Fifth, the MDS itself has limitations, including the limited capture of individual resident behaviors that may disturb other residents and inhibit their care. This may contribute to an underestimation of behavioral problems for individual residents. Finally, owing to data limitation, we may not have measured potentially important facility-level factors, such as location of the NHs (rural vs urban)[21] and staffing, which have been previously linked to quality of care in NHs.[25,26] For example, a higher level of trained nursing staff may improve patient assessment and provide more informed administering and monitoring of antipsychotics in patients with dementia.

In conclusion, safety concerns continue to persist in the use of antipsychotic medications in NH residents whose benefits from these agents are unclear. This study provides evidence that antipsychotic prescribing varies by NHs, independent of residents' clinical characteristics, and NHs antipsychotic prescribing culture may be an important component to explain such variation. Future research is needed to determine why such a prescribing culture exists and whether there are adverse health consequences as a result of our observed facility-level antipsychotic prescribing rate. This study may also inform future policies to target NHs with high antipsychotic prescribing rates to improve quality of care for NH residents.

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