Published in final edited form as:

Am J Geriatr Psychiatry. 2015 October ; 23(10): 999–1006. doi:10.1016/j.jagp.2014.07.001.

Antidepressant Medication Management among Older Patients Receiving Home Health Care

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Abstract

Objective—Antidepressant management for older patients receiving home health care (HHC) may occur through two pathways: nurse-physician collaboration (without patient visits to the physician) and physician management through office visits. This study examines the relative contribution of the two pathways and how they interplay.

Methods—Retrospective analysis was conducted using Medicare claims of 7,389 depressed patients 65 or older who received HHC in 2006–7 and who possessed antidepressants at the start of HHC. A change in antidepressant therapy (vs. discontinuation or refill) was the main study outcome and could take the form of a change in dose, switch to a different antidepressant, or augmentation (addition of a new antidepressant). Logistic regressions were estimated to examine how use of home health nursing care, patient visits to physicians, and their interactions predict a change in antidepressant therapy.

Results—About 30% of patients experienced a change in antidepressants versus 51% who refilled and 18% who discontinued. Receipt of mental health specialty care was associated with a statistically significant, 10–20 percentage-point increase in the probability of antidepressant change; receipt of primary care was associated with a small and statistically significant increase in the probability of antidepressant change among patients with no mental health specialty care and above-average utilization of nursing care. Increased home health nursing care in absence of physician visits was not associated with increased antidepressant change.

Conclusions—Active antidepressant management resulting in a change in medication occurred on a limited scale among older patients receiving HHC. Addressing knowledge and practice gaps

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All authors have no disclosures to report.

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in antidepressant management by primary care providers and home health nurses and improving nurse-physician collaboration will be promising areas for future interventions.

Keywords

medication management; antidepressants; home health care

Older patients receiving home health care have high burdens of mental as well as medical illness. Major and minor depression meeting clinical diagnostic criteria affected almost 1 in 4 older home health patients.(1) Depression in this population was associated with an increased risk of falls,(2, 3) hospitalization,(4) and excess service use.(5, 6) Antidepressants are the dominant mode of treatment of depression in this setting and were used by as much as one-third of all older home health patients.(6, 7) However, antidepressant therapy in this population is characterized by mismatch between need and use,(8, 9) sub-therapeutic doses(1) or pre-mature discontinuation,(10) suggesting poor quality of antidepressant management.

In this study, we use Medicare claims data to examine the quality of antidepressant management in HHC and the processes by which antidepressant changes occur. Medication changes for home health patients can occur via two pathways. In the first pathway, home health nurses evaluate patients' conditions and subsequently communicate with patients' physicians regarding potential needs for medication changes. Alternatively, physicians independently evaluate patients' medication needs during patients' visits to the physicians' offices. There could be overlap between these two pathways, and for both pathways, care coordination between the home health nurse and the physician is important. However, little is known about the relative contribution of the two pathways to active medication management and how they interplay.

This study focuses on patients with antidepressants in their possession at the start of HHC and describes their courses of antidepressant medication while receiving skilled home health nursing care and possibly primary care and mental health (MH) specialty care. We examine the probability of a change in dosage or medication versus refill or discontinuation of the original antidepressant. The data we use do not allow us to assess whether an antidepressant change (or lack thereof) was clinically indicated for a given patient. However, given the current poor quality of antidepressant therapy and low level of antidepressant management in HHC,(1, 8–10) it would be important to understand pathways to active antidepressant management that will likely lead to a higher rate of antidepressant changes *at the population level*. Such understanding will inform design of interventions to improve the quality of depression care among home health patients.

We hypothesize that greater use of skilled nursing care (representing the first pathway) and greater use of primary care and of MH specialty care (the second pathway) predict a greater likelihood of change in antidepressant medication. Since home health nurses routinely communicate and collaborate with patients' primary care providers (PCPs), we hypothesize that skilled nursing care and visits to PCPs are synergistic in contributing to changes in antidepressants.

METHODS

Data and sample

We used data from a 5% random sample of Medicare fee-for-service patients with at least one depression diagnosis in 2006–2007 from the Chronic Condition Warehouse (CCW).(11) Files used included Part D drug event file, carrier claims, home health claims, and beneficiary summary file and the chronic condition summary file.

We restricted the sample to patients 65 years or older who were continuously enrolled in Medicare Parts A&B and had at least one home health episode during 2006–7. We required that patients had been enrolled in Medicare Part D for at least 90 days prior to their admission to HHC (to allow us to observe the medications they possessed at the start of HHC based on the Part D data) and continuously enrolled until the end of 2007. We further restricted the sample to patients with ≥ 1 day of remaining antidepressant supply from a prescription filled on or before the first day of HHC (the index antidepressant; $n=10,126$). We excluded patients who received no nursing visits during their HHC ($n=1,514$) because of our primary interest in the role of home health nursing care in medication management. For patients who had multiple home health episodes in 2006–7, we included their first episodes only, resulting in a final analytical sample of 7,389 patient-episodes.

Unit of analysis

We defined an observation window of antidepressant use for each patient in our sample. This window started with the first day of HHC and ended at 30 days after the depletion of the remaining supply of the index antidepressant. Adding an extra 30 days allows us to capture new prescription fills that took place shortly after the depletion of the index antidepressant, thus avoiding incorrectly classifying patients who retained antidepressants from previous fills or who had a “wash-out” period between medication changes. Depending on the span of the observation window relative to the patient’s length of stay in HHC, HHC overlapped with the observation window partially or entirely.

Measures

Our main outcome, a change in antidepressant therapy, is defined as filling an antidepressant with a different National Drug Code (NDC) within the observation window with or without a refill of the index antidepressant; this may reflect a change in dose, a switch to a different antidepressant, or an augmentation of the therapy by adding a different antidepressant to the index medication. Patients who did not experience a change in antidepressant had one of the following: 1) discontinuation of therapy, defined as not filling any antidepressant within the observation window; 2) refill, defined as filling a medication of the same NDC (reflecting same ingredient(s) and dosage) as that of the index antidepressant (but not any other antidepressant) within the observation window. We do not have dosage information to determine whether a given antidepressant prescription was at the therapeutic or sub-therapeutic level.

We measured use of skilled nursing care by the number of skilled nursing visits a patient received as part of HHC during the observation window. We initially measured use of

primary care using a categorical count of visits (0, 1–2, 3 or more) to a physician with specialty in general practice, family practice, internal medicine, or geriatric medicine, or a nurse practitioner or physician assistant during the observation window. Because results of analysis indicated little difference between the 1–2 and 3 or more categories, we used a dichotomous indicator of ≥ 1 PCP visit (vs. 0) in the final analysis reported below. Use of MH specialty care was measured by a dichotomous indicator of at least one visit to a psychiatrist, psychologist, clinical psychologist, or licensed clinical social worker during the observation window.

Patient demographic characteristics included age at the time of HHC, gender, and race/ethnicity (non-Hispanic white, non-Hispanic black, Hispanic, and others). Patient clinical characteristics included source of referral to HHC (hospital, post-acute settings other than HHC, or recent HHC vs. community referral by a physician, clinic, HMO, or court/law enforcement), whether the patient received a physician diagnosis of depression during the 90 days prior to start of HHC, categorical indicators of days with antidepressants in the 90 days prior to the start of HHC, 9 dichotomous chronic condition indicators based on CCW definitions,⁽¹²⁾ and number of medications other than antidepressants the patient had in possession at the start of HHC.

Statistical analysis

Our main analysis was a logistic regression of a change in antidepressant (vs. refill or discontinuation). As a secondary analysis, we also estimated a multinomial logistic model of the three-category antidepressant outcome: change, discontinuation, or refill (reference category). Key independent variables included measures of home health nursing care, primary care, and MH specialty care described above. In addition, we included a quadratic term of the count of nursing visits to capture any non-linear relationship between the antidepressant change outcome and nursing visits. To test the hypothesis of synergism between home health nursing care and primary care, we included interactions of the nursing-visit count (and its squared term) with the dichotomous PCP visit indicator. Interaction terms of the nursing care measures with the MH specialty care indicator were also included.

Patients in our sample varied substantially in the length of their home health episodes and in the remaining antidepressant supply at start of HHC (and hence the length of the observation window). Heterogeneity associated with these two variables may be correlated with (unmeasured) severity or complexity of the patient or the chronicity of his/her depression, and may confound our analysis. We conducted sensitivity analysis by restricting the sample to 1) patients with length of stay (LOS) in HHC ranging from 14–60 days (78% of the entire sample), and 2) patients with 1–30 days of remaining antidepressant supply and therefore an observation window lasting 31–60 days (86% of the entire sample).

The non-linear models we estimated included quadratic and interaction terms. Estimated coefficients were not directly informative of how home health nursing visits, PCP visits, and MH specialty visits (and their interactions) predict changes in antidepressants. We thus derived predicted probabilities of a change in antidepressant therapy (and their confidence intervals) at each level of nursing visits and by categorical PCP and mental health specialty visits.

RESULTS

Descriptive statistics of the sample are presented in Table 1. Within the observation window, about 51% of the sample refilled the index antidepressant; close to 18% discontinued antidepressant use; and about 31% had a change in their antidepressant therapy. During the 90 days prior to the start of HHC, close to 1/3 of the patients had a physician diagnosis of depression; 80% had antidepressants for fewer than 90 days and 53% had antidepressants for fewer than 30 days, suggesting that the vast majority of patients had recently started antidepressant treatment.

Figures 1a–b present predicted probabilities of an antidepressant change based on the main logistic analysis, by PCP and MH visit categories (no PCP and no MH, no PCP and ≥ 1 MH, ≥ 1 PCP and no MH, ≥ 1 PCP and ≥ 1 MH) and calculated over a range of home health nursing visit counts (from 1 to 19, the 95th percentile). (Figures 1a and 1b present the same results but by different dimensions for better visualization.) As shown in Figure 1a, MH specialty care was associated with a statistically significant increase in the probability of antidepressant change regardless of whether patients had some visits to their PCPs (as indicated by the non-overlapping confidence intervals of the two prediction lines with no MH visit and with at least one MH visit). This increase in probability was twice as large among patients with no PCP visit as among patients with at least one PCP visit (20 vs. 10 percentage points). On the other hand, PCP visits were associated with a small but statistically significant increase in the probability of antidepressant change only among patients who had no MH care and who received 10 or more home health nursing visits, as shown by the diverging prediction lines in the left panel of Figure 1b.

Association between home health nursing care and the probability of antidepressant change differed by whether the patient received PCP care: the probability increased with the number of nursing visits among patients with at least one PCP visit; the same probability decreased among patients with no PCP visit (Figure 1a). The largely parallel lines in each of the two sub-figures in Figure 1a indicate that there was little interaction between MH specialty care and nursing care in predicting antidepressant change.

Based on the logistic model (Table 2), having received a depression diagnosis in the 90 days prior to start of HHC and having a greater number of prescription drugs at start of HHC were associated increased odds of antidepressant change. Having diabetes was associated with a reduced odds of antidepressant change, as was older age, Hispanic ethnicity, and other race, compared to non-Hispanic white. Estimated odds ratios, p-values, and confidence intervals were presented in Table 2.

Sensitivity analysis by restricting to patients with a LOS in HHC of 14–60 days and by restricting to patients with a 31–60 day observation window generated consistent findings with the main analysis (available upon request). Results of the multinomial logistic analysis were quantitatively similar and available as Supplemental Digital Content 1.

DISCUSSION

In this study, we examined the roles of two pathways for antidepressant medication management among older home health patients: management driven by home health nursing care (in collaboration with the patient's physicians) and management driven by patient office visits to PCPs or MH specialty providers, along with potential synergism between the two pathways. We found that increased home health nursing care in absence of PCP visits were not associated with increased antidepressant change; having had one or more MH specialty visits was associated with a substantial, 10–20 percentage-point increase in the probability of antidepressant change; having had one or more PCP visits was associated with a small increase in the probability of antidepressant change among the subset of patients with no MH specialty care and above-average utilization of nursing care. Results suggest some synergistic effects between nursing care and PCP visits, but no or little interactions between nursing care and MH specialty visits.

We draw several observations based on these findings. First, patients' visits to MH specialty providers were an important pathway to active antidepressant management, as indicated by a 50% or more increase in the probability of having a change in antidepressant therapy. However, this pathway was limited to the small set of patients treated with antidepressants who received MH specialty care in the vicinity of HHC (<12%). The pathway through PCP visits seemed limited to patients who were not under active treatment by a MH specialist and who had above-average nursing visits. Antidepressant management through home health nursing care alone, i.e., without patient visits to their physicians, seemed extremely limited. This is based on the finding that an increase in home health nursing visits in absence of physician office visits was not associated with increased antidepressant change.

Second, home health nurses may be playing an important supporting role for antidepressant management through PCP office visits. According to our results, among patients with no MH specialty care, having some PCP office visits (vs. no visit) was associated with increased antidepressant change among patients who received a fair amount of nursing visits (≥ 10). Depression and antidepressant management may have received lower priority and urgency in HHC than medical and rehabilitation needs of patients that rendered them homebound.⁽⁶⁾ Typically, patients are discharged from HHC upon resolution of medical issues, often before sufficient nurse-patient rapport is established to dissipate discomfort and reluctance on both sides to engage in depression care management.^(13, 14) This may explain the finding that the pathway of PCP visits to active antidepressant management was only indicated among patients with 10 or more nursing visits (~20% of our sample). Meanwhile, patients with both PCP visits and a high number of nursing visits may have had elevated severity or complexity that we were not able to adequately control for. The greater likelihood of antidepressant change among these patients may be partially a result of greater intensity of care and heightened attention to their medication needs in general.

Our finding regarding the limited role of antidepressant management outside patient visits to their physicians draw attention to the quality of home health nurse-physician collaboration. A previous study reported poor communication at large between the two groups of clinicians,⁽¹⁵⁾ with both groups expressing low satisfaction with the communication and

lack of ownership of the home care decision-making process. In addition, home health clinicians reported difficulty in contacting physicians when needed. These challenges may be especially salient for communication regarding depression and antidepressants because of the lower priority attached to depression, lack of nurse training in depression assessment and management(16, 17) that limits the usefulness of their assessment, and PCPs' own lack of self-efficacy for antidepressant management(18, 19) and unwillingness to change antidepressants based on nurse assessment alone. Enhancement of nurse skills in assessing depression and of nurse-physician communication is an important component of recently developed interventions for depression quality improvement in HHC,(20, 21) and should continue to be addressed in future research and practice.

We found that Hispanic patients and patients of other race/ethnicity were less likely to have had a change in antidepressants, suggesting an overall lower level of antidepressant management received by these patients compared to their white counterparts. This is consistent with previous findings that minority patients were in general less likely to receive minimally adequate care for depression once care starts,(22–25) and disparities in depression treatment by race/ethnicity among older home health patients in particular.(8) Our other finding about the decreased odds of antidepressant change associated with a diabetes diagnosis suggests that the presence of a major chronic condition might have distracted the provider and the patient from adequately addressing depression.

At the policy level, recent initiatives under the Affordable Care Act are highly congruent with the need to improve medication management for older home health patients. Prominent reform models include the Medicare Accountable Care Organizations, readmission penalties for hospitals, proposed value-based purchasing for HHC, and bundled payment covering inpatient and post-acute care. By aligning incentives with inter-setting and inter-disciplinary collaboration and rewarding patient outcomes, these new developments provide impetus for improving the quality of antidepressant and other medication management for older home health patients.

Our study has a number of limitations. The Medicare claims data we relied on did not provide information on whether or to what extent medication management occurred during physician office visits or through home health nurse-physician collaboration. Results are thus suggestive of the relative importance of the pathways and do not provide definitive evidence. As in all observational studies, the amount of home health nursing care and the number of physician office visits were not randomly assigned to patients and might be correlated with unobserved patient or provider characteristics. Results thus represent associations but not causation. In particular, worsening of depression may have partially led to a visit to an MH specialist. As a result, the greater likelihood of an antidepressant change associated with MH specialty care may reflect both a heightened need for medication changes and more active antidepressant management by MH specialists. In the absence of more detailed clinical information, we were not able to tell whether a given antidepressant outcome (change vs. discontinuation or refill) was clinically warranted. However, given the large proportion of HHC patients treated with antidepressants who were either on sub-therapeutic doses (31%) or non-compliant (18%),(1) it is likely that a substantial amount of “refills” seen in our data represent sub-optimal antidepressant use. Finally, we do not

examine initiation of antidepressants during HHC, another important quality improvement area for depression care in this population.

CONCLUSIONS

Findings of this study suggest low level of active antidepressant management for older patients receiving HHC, with the majority of patients refilling the same antidepressant. Mental health specialty care was an important pathway to active antidepressant management. However, its impact was limited to the small set of home health patients in receipt of MH specialty care. The pathway through PCP office visits had some albeit limited contribution among patients with no MH specialty care. While the pathway through home health nurse-physician collaboration (without patient office visits) had little or no contribution, home health nurses might be playing an assistive role with PCP office-based management. Addressing the knowledge and practice gaps pertaining to PCPs and home health nurses regarding antidepressant management and nurse-physician collaboration will be promising areas for future interventions.

Supplementary Material

Refer to Web version on PubMed Central for supplementary material.

Acknowledgments

This work was supported by grants from the National Institute of Mental Health (K01MH090087: YB; R03MH085834: YB, HS; P30MH085943: YB, MLB). Dr. Press was supported in part by funds provided to him as a Nanette Laitman Clinical Scholar in Public Health at Weill Cornell Medical College.

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Figure 1.
Predicted probability of antidepressant change

Table 1

Descriptive statistics of study sample (n=7,389)

	% or mean
<i>Demographics</i>	
Age: 65–74	28.9%
75–84	42.1%
>=85	29.0%
Female (vs. male)	82.0%
Race/ethnicity: White, non-Hispanic	88.5%
Black, non-Hispanic	6.1%
Hispanic	3.7%
Other race/ethnicity	1.7%
<i>Clinical characteristics</i>	
Home health referral source: Community-based	51.7%
Inpatient or post-acute setting	48.3%
Physician diagnosis of depression during 90 days prior to start of HHC	32.1%
# of days with antidepressants during 90 days prior to start of HHC: <30 days	52.5%
<60 days	65.0%
<90 days	79.6%
# of Rx other than antidepressant at start of HHC	6.9
# of grouped chronic conditions*	4.3
HHC length of stay: <14 days	5.2%
14–60 days	78.3%
>60 days	16.5%
Remaining days of antidepressant supply at start of HHC: 1–30 days	85.9%
31–60 days	10.1%
61+ days	4.0%
<i>Health care utilization during observation window**</i>	
# of skilled nursing visits	8.9
Visits to primary care providers: 0 visit	20.8%
1–2 visits	42.1%
3 or more visits	37.1%
>=1 visits to a mental health specialty provider	11.8%
<i>Antidepressant medication outcome</i>	
Discontinuation	17.9%
Continuation with the same antidepressant (refill)	50.8%
Change in antidepressant***	31.3%

HHC-home health care;

* A count of the following conditions based on Chronic Condition Warehouse definitions: cardiovascular disease, dementia, cataract or glaucoma, Osteoporosis/Rheumatoid Arthritis/Osteoarthritis, cancer, diabetes, hip fracture, chronic kidney disease, and chronic obstructive pulmonary disease (COPD).

** Observation window started with the first day of HHC and ended with 30 days after the depletion of antidepressant supply the patient possessed at the start of HHC.

*** Change in antidepressant is defined as starting an antidepressant of a different NDC within the observation window with (augmentation) or without (switching) the continuation of the index antidepressant

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Table 2

Adjusted odds ratios of change in antidepressant (vs. discontinuation or refill)

Predictors	Odds Ratio	z-statistic	p-value	95% confidence interval
# of skilled nursing visits	0.95	-3.27	0.001	(0.92, 0.98)
# of skilled nursing visits ²	1.00	2.64	0.008	(1.00, 1.00)
# of PCP visits: 0	(reference)			
# of PCP visits: 1 or more	0.67	-2.93	0.003	(0.51, 0.88)
Skilled nursing visits x 1 or more (vs. 0) PCP visits [*]	1.08	4.15	<0.001	(1.04, 1.12)
Skilled nursing visits ² x 1 or more (vs. 0) PCP visits [*]	1.00	-3.19	0.001	(1.00, 1.00)
# of MH specialty visits: 0	(reference)			
# of MH specialty visits: 1 or more	1.90	1.73	0.083	(0.92, 3.93)
Skilled nursing visits x 1 or more MH specialty visits [#]	1.04	0.84	0.398	(0.95, 1.15)
Skilled nursing visits ² x 1 or more MH specialty visits [#]	1.00	-0.77	0.443	(1.00, 1.00)
1 or more PCP visits x 1 or more MH specialty visits	0.84	-0.44	0.662	(0.38, 1.83)
Patient demographic characteristics				
Age, 65–74	(reference)			
75–84	0.89	-1.8	0.072	(0.79, 1.01)
85 or older	0.85	-2.24	0.025	(0.74, 0.98)
Gender, male	(reference)			
female	1.07	0.98	0.327	(0.93, 1.23)
Race/ethnicity, non-Hispanic white	(reference)			
Non-Hispanic black	1.01	0.11	0.911	(0.82, 1.25)
Hispanic	0.70	-2.42	0.016	(0.53, 0.93)
Other	0.50	-3.03	0.002	(0.32, 0.78)
Patient clinical characteristics				
Source of admission to HHC: community	(reference)			
Inpatient or post-acute settings	0.99	-0.23	0.818	(0.89, 1.09)
Depression diagnosis during 90 days prior to start of HHC	1.26	4.13	<0.001	(1.13, 1.40)
# of days with antidepressants during 90 days prior to start of HHC: <30 days	(reference)			
30–59 days	1.08	0.94	0.347	(0.92, 1.27)
60–89 days	1.10	1.22	0.223	(0.94, 1.27)

Predictors	Odds Ratio	z-statistic	p-value	95% confidence interval
90 days	1.35	4.49	<0.001	(1.18, 1.54)
# of non-antidepressant prescription medications at start of HHC	1.03	4	<0.001	(1.01, 1.04)
Cardiovascular Disease	1.05	0.72	0.469	(0.92, 1.20)
Dementia	1.11	2	0.045	(1.00, 1.24)
Cataract or glaucoma	0.99	-0.14	0.887	(0.89, 1.11)
Osteoporosis/rheumatoid arthritis/osteoarthritis	0.94	-1.16	0.245	(0.84, 1.04)
Cancer	1.00	0.03	0.975	(0.84, 1.20)
Diabetes	0.88	-2.19	0.028	(0.79, 0.99)
Hip fracture	1.12	1.16	0.245	(0.92, 1.36)
Chronic kidney disease	1.10	1.62	0.105	(0.98, 1.23)
Chronic obstructive pulmonary disease	1.07	1.19	0.234	(0.96, 1.19)

PCP-primary care provider; HHC: Home Health Care; MH-mental health

Number of skilled nursing visits, of PCP visits and of mental health specialty visits were measured within the observation window.

* A Chi-square test (with 2 degrees of freedom) that the coefficients pertaining to these two interaction terms are jointly zero yielded test statistic of 16.87, with a p-value of <0.001.

A Chi-square test (with 2 degrees of freedom) that the coefficients pertaining to these two interaction terms are jointly zero yielded test statistic of 0.64, with a p-value of 0.728.