



# HHS Public Access

Author manuscript

*Home Healthc Now*. Author manuscript; available in PMC 2018 June 01.

Published in final edited form as:

*Home Healthc Now*. 2017 June ; 35(6): 304–313. doi:10.1097/NHH.0000000000000553.

## Prevalence of and Factors Related to Prescription Opioids, Benzodiazepines, and Hypnotics among Medicare Home Health Recipients

**Brandi Parker Cotton, PhD, MSN, APRN [Postdoctoral Research Fellow],**

Department of Psychiatry, Geisel School of Medicine at Dartmouth, Lebanon, New Hampshire

**Matthew C. Lohman, PhD [Postdoctoral Research Fellow],**

Department of Psychiatry, Geisel School of Medicine at Dartmouth, Lebanon, New Hampshire

**Jessica Brooks, PhD [Postdoctoral Research Fellow],**

Department of Psychiatry, Geisel School of Medicine at Dartmouth, Lebanon, New Hampshire

**Karen Whiteman, PhD [Postdoctoral Research Fellow],**

Department of Psychiatry, Geisel School of Medicine at Dartmouth, Lebanon, New Hampshire

**Yuhua Bao, PhD [Associate Professor of Healthcare Policy and Research],**

Department of Healthcare Policy and Research and Department of Psychiatry, Weill Cornell Medical College, New York, NY, USA

**Rebecca L. Greenberg, MS, and**

Clinical Database and Statistics Consultant, Self employed, Chappaqua NY

**Martha L. Bruce, PhD, MPH [Professor]**

Department of Psychiatry, Geisel School of Medicine at Dartmouth, Lebanon, New Hampshire

### Abstract

High rates of controlled prescription drugs are associated with cognitive impairment, falls, and misuse and dependence. Little is known about the prevalence of these medications among older adults receiving home healthcare. The purpose of this study was to determine the frequency of, and the factors related to, opioid analgesics, benzodiazepines (BNZ), and non-benzodiazepine (NBNZH) hypnotics among a large sample of older adults entering home health services. The data came from administrative records of 133 Certified Home health Agencies located across 32 states. Patients (age  $\geq 65$ ) receiving Medicare home health services and who received a start-of-care Medicare OASIS assessment between Jan. 1, 2013 and Dec. 31, 2014 were included in the study ( $n = 87,780$ ). Rates of controlled medication use were compared across patient-level sociodemographic, clinical, functional, and environmental variables. The prevalence of controlled medication was high, with 58% prescribed at least one class of controlled drug, 44% were prescribed an opioid, 19% were prescribed a BNZ, and almost 7% were prescribed a NBZDH. Factors independently associated with higher levels of controlled medication usage include

---

**Correspondence to:** Brandi Parker Cotton, PhD, MSN, APRN, Department of Psychiatry, Geisel School of Medicine at Dartmouth, 46 Centerra Parkway, Suite 200, Lebanon, NH 03766, brandi.p.cotton@dartmouth.edu.

The authors declare no conflicts of interest

younger-old age, white race, post-surgical status, injuries, referral from inpatient settings and rural location. Home health clinicians are well-positioned to review and reconcile medication, oversee referrals and follow-up care, and provide ongoing assessment of risk regarding the use of opioids, BNZ, and hypnotics among home health patients.

---

## INTRODUCTION

Controlled prescription drugs, such as opioid analgesics, benzodiazepines (BNZ), and non-benzodiazepine hypnotics (NBNZH), are frequently prescribed to older adults. Prescriptions for opioid analgesics more than doubled from 1999–2010 among the general population of US adults age 65 years or older (Steinman, Komaiko, Fung, & Ritchie, 2015). BNZ are prescribed at a rate of 8.7% among those age 65–80 years (Olfson, King, & Schoenbaum, 2015) and prescription drugs for the treatment of insomnia are prescribed with an estimated prevalence of 4–5% among adults 60 years of age and older (Bertisch, Herzig, Winkleman, & Buettner, 2014).

While controlled drugs are often prescribed for legitimate medical reasons, their use poses potential adverse consequences, especially among older adults, such as increased risk of cognitive decline, falls (Huang et al., 2012) and misuse or dependence (Simoni-Wastila & Yang, 2006). Age-related changes in pharmacokinetics and pharmacodynamics make older adults especially vulnerable to adverse events and harmful drug interactions (Huang et al., 2012).

Controlled prescription medication may be especially relevant to Medicare home health as the majority of patients are referred for these services following hospitalization when controlled substances may be newly prescribed. These patients may be particularly vulnerable given their high level of medical burden, functional impairment, and polypharmacy. At the same time, medication reconciliation and management is a routine component of home care, offering an opportunity to mitigate potential risks associated with use of controlled prescription drugs.

This article uses administrative data from a large sample of older home health patients to describe the use of controlled prescription drugs, including opioid analgesics, BNZ, and NBNZH in these patients and to identify sociodemographic, clinical, functional, and environmental factors associated with their use. The purpose of this paper is to estimate the overall burden in this patient population, describe vulnerable subpopulations where prevalence is highest, and identify potential opportunities for nursing intervention.

## METHODS

### Sample

The sample included Medicare home care patients under the care of 132 home care agencies that subscribed to Brightree, LLC, a software company offering web-based support for clinical tracking, referral, care planning, reporting, and billing. Electronic health records were obtained in the context of an agency-randomized implementation trial that offered agencies access to web-based resources to support their clinicians' use of a depression care

management protocol. The protocol was integrated into the standard clinical software and available to all clinicians for use with patients who screened positive for depression on the Medicare Outcome and Assessment Information Set (OASIS).

The 132 home care agencies were located across 32 states. Agencies served an average of 333 patients per year, similar to national statistics (Centers for Disease Control and Prevention, 2004). Patient sociodemographic characteristics (for example, 63.3% female, 33.2%  $\geq$  age 86, 87.5% white, 11.1% black) were likewise similar to national data (Centers for Disease Control and Prevention, 2004).

This sample included all Medicare patients (age  $\geq$  65) who received a Medicare-mandated start-of-care episode using the (OASIS) between Jan. 1, 2013 and Dec. 31, 2014. For the subset of patients who started home care more than once over the two-year period (n=13,357), only the first episode was included in analysis. Our final sample included 87,780 unique patient episodes. Data collection and analysis were approved by the Weill Cornell Medical College and Dartmouth College Institutional Review Boards.

## Measures

**Controlled prescription medication**—Controlled medications were determined using American Hospital Formulary Service (AHFS) codes and medication names, recorded by nurses during start-of-care OASIS assessment for each patient. We considered controlled prescriptions to include opioids (AHFS codes: 28.08.08; 28.08.12), benzodiazepines (AHFS codes: 28.12.08; 28.24.08), non-benzo hypnotics (AHFS code: 28.24.92), stimulants (AHFS code: 28:28.20) or use of these medications in combination drugs containing controlled ingredients.

**Independent predictors**—Sociodemographic, clinical, functional, and environmental variables as potential independent predictors of controlled prescription drugs were derived from the OASIS conducted at patients' start-of-care. *Sociodemographic* information included age (65–74, 75–84, and 85+), race (white, black, Asian, and other race) and ethnic group (Hispanic vs. non-Hispanic), dual Medicaid/Medicare eligibility, and home care referral source.

**Clinical Factors:** Clinical Factors were measured using ICD-9 codes and included 1) six most common primary home care diagnoses – congestive heart failure, chronic obstructive pulmonary disease (COPD), stroke, skin wound or ulcer, and type-2 diabetes, 2) two common non-disease home care indications relevant to controlled substance use—rehabilitation after bone fracture and surgical aftercare, and 3) obesity as recorded in the OASIS.

**Functional factors:** Functional factors included limitation in nine activities of daily living (ADL) –grooming, dressing upper body, dressing lower body, bathing, toilet transferring, toilet hygiene, transferring, ambulation, and feeding – and were summed so that higher scores represent greater limitation. ADL limitation summary score was then standardized for analysis (Mean=0, SD=1). Patients with pain that interfered with movement or activity daily or all of the time were considered to have severe pain. Poor cognitive functioning was

operationalized as requirement of considerable assistance or total dependence on others due to cognitive disturbance. Finally, depressive symptoms were measured using the two-item Patient Health Questionnaire (PHQ-2) depression screen (Kroenke, Spitzer, & Williams, 2003). A PHQ-2 score of 3 or greater indicated clinically meaningful depressive symptoms (Kroenke et al, 2003).

**Environmental factors:** Environmental factors considered in analysis included: 1) referral source (hospital, skilled nursing or rehabilitation facility, community or other), 2) agency type (free-standing or hospital based), 3) agency location (rural versus metropolitan), and 4) geographic region (Northeast, South, West, or Midwest).

### Analytic Strategy

We generated descriptive statistics indicating the prevalence of controlled prescription drugs by each potential predictor variable. For the composite indicator of controlled medication use and for specific types of medications, bivariate logistic regression models were fit with any controlled medication as the binary dependent variable and each potential predictor as the independent variable. Given the large size of the sample, predictors were retained for multivariate analysis on the basis of statistical significance ( $p < .05$ ) and size (i.e., predictors associated with at least 10% greater or lesser odds of controlled medication usage). Multivariable logistic regression models were then fit with all retained predictor variables and demographic covariates. Multivariable logistic regression models were then fit separately for each class of controlled medication. All analyses were performed using Stata statistical software version 14.1 (StataCorp, College Station, TX).

## RESULTS

The prevalence of controlled medication within the sample was high with 58% prescribed at least one class of controlled drug; 44% of patients were prescribed an opioid, 19% were prescribed a BNZ, and almost 7% were prescribed a NBNZH (See Table 1). Use of controlled medications varied by sociodemographic factors. Use of opioids, BNZ, and NBNZH decreased with advancing age with adults aged 65–74 years having the highest prevalence, followed by adults 75–84 years of age. Females were more likely than males to use all three classes of medication. White patients were more likely to receive opioid prescriptions than minority groups.

The prevalence of controlled medications also varied by clinical factors (Table 2). Use of all three classes of medication was highest among patients reporting severe pain. The three diagnoses with the highest rate of prescription opiates were surgical aftercare, rehabilitation, and osteoarthritis; BNZ and NBNZH use was most common among those diagnosed with Chronic Obstructive Pulmonary Disease (COPD).

In adjusted models (See Table 3), several primary medical diagnoses and conditions (indicating reasons for referral to home care) remained significantly associated with use of any controlled drug and specifically with use of opioid analgesics, including post-surgical operation (any: OR 2.54, CI 2.41–2.69; Opioid OR 3.41, CI 3.24–3.59), rehabilitation (any: OR 1.45, CI 1.33–1.59; Opioid OR 2.07, CI 1.90–2.26), and osteoarthritis (any: 1.24, CI

1.11–1.38; Opioid OR 1.35, CI 1.22–1.51). (See Table 2). These conditions were not associated with use of BNZ or Hypnotics. Primary diagnoses of heart failure, stroke, and Diabetes Mellites Type 2 were each associated with a lower probability of using any class of controlled medications.

Depression (PHQ-2 = 3) was associated with a greater likelihood of using any controlled medication (OR 1.33 CI 1.23 – 1.43), and specifically with using a NBNZH (OR 1.71 CI 1.53–1.90), or BNZ (OR 1.95 CI 1.81–2.11). Patients experiencing limitations in activities of daily living or severe pain were more likely to receive prescriptions for all three classes of medication. Obesity was associated with an increased use of opiates and a decreased use of BNZ.

Adjusting for clinical factors, patients referred from either a hospital or skilled nursing facility (SNF) were more likely to receive controlled medication compared to community clinic referrals. Patients referred from hospitals and SNF/rehabilitation centers were more likely to use opioids and patients from SNF/rehabilitation centers were also more likely to use both a BNZ and a NBNZH when compared to patients from community clinics. Patients receiving care from public home care agencies were more likely than other patients to receive a prescription for a controlled medication (OR 1.21, CI 1.14–1.28). The same trend was observed for BNZ prescriptions (OR 1.21, CI 1.13–1.29). Patients prescribed opioids receiving care from a religion-affiliated agency (OR 1.24, CI 1.11–1.38), public agency (OR 1.19, CI 1.13–1.27), and a private agency (OR 1.06, CI 1.01 – 1.10) compared to a proprietary agency. Patients receiving care from home care agencies located in rural areas were also more likely to receive any class of controlled medications and specifically opioids.

Adjusting for other factors, patients residing in the Southern US were most likely to receive at least one of class of controlled medication (OR 1.65, CI 1.58 – 1.72) compared to those in the Northeast. Rates were also higher for patients living in the Western (OR 1.63, CI 1.58 – 1.72) and Midwestern regions (1.40, CI 1.35 – 1.46). The highest rate of opioid use was observed in the Western US (OR 2.20, CI 2.01 – 2.41), Southern regions (OR 1.76, CI 1.68 – 1.84), and Midwest (OR 1.65, CI 1.58 – 1.72) when compared to the Northeast. The same pattern was observed for NBNZH: West (OR 1.76, CI 1.52 – 2.04), South (OR 1.57, CI 1.45 – 1.70), Midwest (OR 1.23, CI 1.13 – 1.33), when compared to the Northeast. BNZ prevalence was highest in the South (OR 1.32, CI 1.25 – 1.39).

## DISCUSSION

This study's major finding is that well over half (58%) of patients (age ≥ 65) start Medicare home care services having been prescribed at least one controlled medication, most commonly opioids (44.0%) and to a lesser degree benzodiazepines (18.9%) and hypnotics (6.8%). While the likelihood of starting home care while using controlled medications varied by clinical status, sociodemographic factors, and region, the prevalence of controlled medication use was greater than 50% in almost all categories.

The high prevalence of opioids among home care patients with injuries, post-surgical, or pain may be consistent with clinical need, yet also raises important questions. Given the

recent increase in opioid addiction within the United States, the high prevalence among this population raises concerns of the risk of misuse. Patients with a history of substance use disorder are more likely to demonstrate misuse of opioids (Pain Management Opioid Safety VA Educational Guide, 2014), suggesting that careful screening for current and past drug and/or alcohol abuse is critical to understanding patients' risk. Home health clinicians are well-positioned to review and identify potentially inappropriate medication and provide relevant psychoeducation regarding the dangers of misuse and dependence. They frequently provide care over time and have unique opportunities to improve care management. For example, recent efforts to improve outcomes related to depression have produced positive patient outcomes and illustrate the effectiveness of training home care nurses to assist in managing specific conditions among the home care population (Bruce et al., 2011 and Bruce et al., 2016). From this vantage point, home health clinicians can assist in assessment, education, and monitoring in order to help reduce the risk of adverse outcomes associated with opioid prescription usage. Additionally, home health clinicians may identify improvement in pain symptoms at which point opioid analgesics may no longer be needed.

BNZs were prescribed to 19% of the sample of home care patients, more than double the usage among older adults in the general population (Olfson et al., 2015). BNZs are one of the most common class of prescription drugs in the world (Donoghue & Lader, 2010; Lucchetti & Lucchetti, 2016) and older adults are frequently prescribed these medications to treat general or acute anxiety (Alvarenga et al., 2014). Insomnia, a common complaint among older adults is often treated with non-benzodiazepine hypnotics (NBNZH); among our sample, NBNZH were prescribed to almost 7% of those 65 years of older, compared to general samples estimated at 4 – 5 % (Bertisch, et al., 2014). Both BNZs and NBNZH are listed as potentially inappropriate medication on the American Geriatric Society BEERS Criteria (American Geriatrics Society 2015 Beers Criteria Update Expert Panel). While the BEERS Criteria suggest that BNZ may be appropriate for managing certain conditions, it strongly cautions prescribers to weigh the benefits of this class of medication against the increased risk of falls, delirium, and cognitive impairment. NBNZH, which have similar receptor activation to that of BNZ, cause similar adverse effects and should not be used over 90 days (American Geriatrics Society, 2015). These data highlight the challenge of managing psychiatric comorbidities such as anxiety and sleep disorders while considering the risk associated for both adverse outcomes such as falls and cognitive impairment as well as dependence and potential for abuse.

Even after controlling for clinical indicators, controlled medication use varied by several sociodemographic factors. Adults 85 years and above were less likely to take a controlled medication than adults age 65–74. This finding is similar to prior research which investigated the use of (PIM) within a home health care sample of approximately 3100 adults. The likelihood of receiving a potentially inappropriate medication decreased as older adults advanced in age, with adults 85 years or above least likely to receive a medication classified as a potentially inappropriate medication (Bao, Shao, Bishop, Schackman, & Bruce, 2012). It may be that prescribers exercise more caution with much older patients in the use of controlled medications, which carry potential risks for cognitive impairment and falls. After controlling for age and clinical factors, female home health patients were more likely than men to receive both opiates and benzodiazepines, a trend which parallels the

general population (Steinman et al., 2015; Olfson et al., 2015; Center for Disease Control, 2013). This same gender difference has also been observed with potentially inappropriate medication (Morgan et al., 2016) as well as psychotropic medications (Taggart, McCammon, Allred, Horner, & May, 1993). Differential prescribing patterns may be the result of various social forces related to gender which shape health care expectations and experiences (Morgan et al., 2016).

Home health patients referred from hospitals, SNFs or Rehabilitation Centers were more likely to receive a prescription for a controlled medication than patients referred from the community. Falls, Injuries, and acute illnesses are antecedents to hospitalization or rehabilitation and are correlated with pain symptoms. While prescription opioids are often clinically indicated, the high prevalence among this population underscores the important role of home health clinicians in follow-up and post-discharge care.

Similar to the findings of the Centers for Disease Control, the likelihood of using controlled prescription drugs varied by region of the country (Centers for Disease Control, 2014). In our sample, patients in Southern and Western regions had the greatest likelihood of receiving an opioid or NBNZH, although only a small number of agencies were located in the Western regions of the US. It is unclear whether unobserved variables influence the disparities observed in various regions or if this reflects differences in prescribing practices. Regardless of location, home health care visits allow equal opportunities for psychoeducation regarding the risk of tolerance and misuse for these classes of medication.

As our findings suggest, home health clinicians are an integral part of interdisciplinary efforts to improve outcomes for elderly adults entering home health services. Inappropriate medication usage and complicated medication regimens are two important predictors of hospital readmission among home health patients (Dierich, Mueller, and Westra, 2011). Furthermore, transitional care episodes are subject to high risk of medication discrepancies as classes of medication are commonly added, discontinued, or adjusted (Fitzgibbon, Lorenz, Lach, 2013). Medication reconciliation is a critical safety measure, ensuring that an up-to-date medication list is acquired among all patients transferring care. Exercising precision in reconciliation and documentation determines if classes of medication such as opioids, BZPs, and hypnotics should be continued. Additionally, clinicians providing care for patients in the home have ongoing opportunities to engage in conversation regarding changes in symptoms and assist patients in determining when these medications may no longer be needed. It also allows home health clinicians to provide continued psychoeducation regarding the potential dangers and side effects of these high-risk medications while encouraging judicious and short-term usage, when possible.

There are several limitations of this study. First, this study did not compare dosage strength or short-vs long-acting opioids, BZPs, or NBNZH. Similarly, the indication for usage for each medication could not be determined by the available data. Finally, the analysis of prevalence of controlled drugs by geographical region was limited by the smaller number of patients in the west.

In spite of these limitations, this study is among the first to investigate the prevalence of opioids, BZPs and NBNZH within a large sample of older adults at the start of Medicare home health services. These findings have important implications for home care clinicians and health care policy and suggest that home health is a point of engagement, where clinicians have unique opportunities to improve outcomes for recipients of home health services.

## CONCLUSION

In this large sample of older patients beginning Medicare home health services, over 50% of patients had been prescribed a controlled medication. Controlling for clinical factors, rates of controlled medication use varied significantly by age, gender, referral source, and geographical region. The health status and comorbidities of the majority of older adults receiving home health services highlight the challenge of treating symptoms such as pain, anxiety, and insomnia, while simultaneously considering the risk of adverse outcomes. Home health clinicians are well-positioned to engage in risk assessment, review and reconcile medication, oversee appropriate referrals, and offer psychoeducation regarding the potential for misuse and dependence.

## Acknowledgments

This study was supported by the grants R01 MH096441 and T32 MH073553 from the National Institute of Mental Health and grant P30 AG022845-12 from the National Institute on Aging at the National Institute of Health.

## References

- Alvarenga JM, Giacomini KC, Loyola Filho AI, Uchoa E, Firmo JO. *Rev Saude Publica*. 48(6):866–72. DOI: 10.1590/S0034-8910.2014048004986
- American Geriatrics Society. Beers Criteria Update Expert Panel. American Geriatrics Society Updated Beers Criteria for Potentially Inappropriate Medication Use in Older Adults (2015). *Journal of the American Geriatrics Society*. 2015; 63(11):2227–2246. [PubMed: 26446832]
- Bao Y, Shao H, Bishop TF, Schackman BR, Bruce ML. Inappropriate Medication in a National Sample of US Elderly Patients Receiving Home health Care. *J Gen Intern Med*. 2012; 27(3):304–310. [PubMed: 21975822]
- Bertisch SM, Herzig SJ, Winkelman JW, Buettner C. National use of prescription medications for insomnia: NHANES 1999–2010. *Sleep*. 2014; 37(2):343–349. [PubMed: 24497662]
- Bruce ML, Sheeran T, Raue PJ, Reilly CF, Greenberg RL, Pomerantz JC, Meyers BSMD, Mark Weinberger MI, Johnston CL. Depression Care for Patients at Home (Depression CAREPATH): Intervention Development and Implementation. *Home healthcare Nurse*. 2011; 29(7):416–426. [PubMed: 21716043]
- Bruce M, Lohman M, Greenberg R, Bao Y, Raue P. Integrating depression care management into Medicare home health reduces risk of 30- and 60-day hospitalization: The Depression CAREPATH cluster-randomized trial. *Journal of the American Geriatrics Society*. 2016; 64(11):2196–2203. DOI: 10.1111/jgs.14440 [PubMed: 27739067]
- Centers for Disease Control and Prevention. National Center for Health Statistics. Home health Care Patients: Data from the 2000 National Home and Hospice Care Survey. Centers for Disease Control and Prevention; 2004. (online). Retrieved from <http://www.cdc.gov/nchs/pressroom/04facts/patients.htm>
- Center for Disease Control and Prevention. Prescription Painkiller Overdoses: A Growing Epidemic, Especially Among Women. Atlanta, GA: Centers for Disease Control and Prevention; 2013. (online). Retrieved from <http://www.cdc.gov/vitalsigns/prescriptionpainkilleroverdoses/index.html>



- Centers for Disease Control and Prevention. Opioid Painkiller Prescribing Where You Live Makes a Difference. Centers for Disease Control; 2014. (online) Retrieved from <http://www.cdc.gov/vitalsigns/opioid-prescribing/>
- Dierich MT, Mueller C, Westra BL. Medication regimens in older home care patients. *Journal of Gerontological Nursing*. 2011; 37(12):45–55. [PubMed: 22084961]
- Donoghue J, Lader M. Usage of benzodiazepines: A review. *International Journal of Psychiatry in Clinical Practice*. 2010; 14(2):78–87. [PubMed: 24922466]
- Fitzgibbon M, Lorenz R, Lach H. Medication reconciliation: reducing risk for medication misadventure during transition from hospital to assisted living. *Journal of Gerontology Nursing*. 2013; 39(12):22–9.
- Huang AR, Mallet L, Rochefort CM, Eguale T, Buckeridge DL, Tamblyn R. Medication-related falls in the elderly: causative factors and preventive strategies. *Drugs Aging*. 2012; 29:359–376. [PubMed: 22550966]
- Kroenke K, Spitzer RL, Williams JB. The Patient Health Questionnaire-2: Validity of a two-item depression screener. *Medical Care*. 2003; 41:1284–1292. [PubMed: 14583691]
- Lucchetti G, Lucchetti AL. Inappropriate prescribing in older persons: A systematic review of medications available in different criteria. *Archives of Gerontology and Geriatrics*. 2016; 14(68): 55–61.
- Morgan SG, Weymann D, Pratt B, Smolina K, Gladstone EJ, Raymond C, Mintzes B. Sex differences in the risk of receiving potentially inappropriate prescriptions among older adults. *Age and Ageing*. 2016; 0:1–8.
- Centers for Disease Control and Prevention. National Center for Health Statistics. Home health Care Patients: Data from the 2000 National Home and Hospice Care Survey. Centers for Disease Control and Prevention; 2004. (online) Available <http://www.cdc.gov/nchs/pressroom/04facts/patients.htm>
- Olfson M, King M, Schoenbaum M. Benzodiazepine use in the United States. *JAMA Psychiatry*. 2015; 72(2):136–142. [PubMed: 25517224]
- Pain Management Opioid Safety VA Educational Guide. US Department of Veterans Affairs (online). 2014. Retrieved from [http://www.va.gov/PAINMANAGEMENT/docs/OSI\\_1\\_Toolkit\\_Pain\\_Educational\\_Guide.pdf](http://www.va.gov/PAINMANAGEMENT/docs/OSI_1_Toolkit_Pain_Educational_Guide.pdf)
- Simoni-Wastila L, Yang HK. Psychoactive drug abuse in older adults. *American Journal of Geriatric Pharmacotherapy*. 2006; 4(4):380–394.
- Steinman MA, Komaiko KD, Fung KZ, Ritchie CS. Use of opioids and other analgesics by older adults in the United States, 1999–2010. *Pain Medicine*. 2015; 16(2):319–327. [PubMed: 25352175]
- Taggart LAP, McCammon SL, Allred LJ, Horner RD, May HJ. Effect of patient and physician gender on prescriptions for psychotropic drugs. *Journal of Womens Health*. 1993; 2:353–7.

### Suggested callouts

Age-related changes in pharmacokinetics and pharmacodynamics make older adults especially vulnerable to adverse events and harmful drug interactions

The prevalence of controlled medication within the sample was high with 58% prescribed at least one class of controlled drug; 44% of patients were prescribed an opioid, 19% were prescribed a BNZ, and almost 7% were prescribed a NBNZH

This study's major finding is that well over half (58%) of patients (age ≥ 65) start Medicare home care services having been prescribed at least one controlled medication, most commonly opioids (44.0%) and to a lesser degree benzodiazepines (18.9%) and hypnotics (6.8%).

**Table 1**  
Rates of Controlled Medication Use by Sociodemographic and Agency Factors

	N	% Any Med	% Opiate	% BNZ	% Hypnotic
Total	87,780	58.1%	44.0%	18.9%	6.8%
Age (Years)					
65 to 74	26,364	71.2%	59.7%	22.3%	9.2%
75 to 84	32,259	58.7%	43.9%	19.1%	6.8%
85+	29,157	45.5%	29.9%	15.5%	4.7%
Gender					
Female	55,599	60.7%	45.3%	21.1%	7.3%
Male	32,181	53.6%	41.7%	15.1%	6.0%
Race					
White	76,847	59.1%	44.3%	19.9%	7.1%
Black	9,697	51.3%	41.7%	11.6%	4.8%
Asian	672	46.6%	37.8%	8.2%	5.4%
Other	563	54.9%	44.6%	14.0%	5.0%
Hispanic					
Yes	1,696	55.4%	41.5%	15.2%	6.5%
No	86,084	58.1%	44.1%	18.9%	6.8%
Lives alone					
Yes	22,997	57.4%	43.3%	19.3%	7.1%
No	64,783	58.3%	44.3%	18.7%	6.7%
Dual Medicare/Medicaid					
Eligible	2,978	60.3%	45.1%	22.4%	9.2%
Not Eligible	37,275	58.0%	44.0%	18.8%	6.7%
Referral Source					
Hospital	35,638	63.6%	51.8%	18.8%	7.0%
Community	27,619	50.1%	32.9%	18.9%	6.1%
SNF/Rehabilitation	23,881	59.1%	45.4%	18.8%	7.3%
Other	640	56.6%	34.7%	22.8%	6.4%
Region					

	N	% Any Med	% Opiate	% BNZ	% Hypnotic
Northeast	23,704	49.7%	34%	17.2%	5.2%
South	35,394	62.8%	48.8%	21.4%	8.0%
Midwest	25,760	58.9%	45.7%	17.2%	6.4%
West	2,922	62.0%	52.3%	16.5%	9.0%
Rural location					
Yes	17,061	64.1%	50.7%	21.1%	7.6%
No	70,719	87.6%	42.4%	18.3%	6.6%
Hospital-based agency					
Yes	17,520	60.0%	45.9%	20.1%	7.5%
No	70,260	57.6%	43.5%	18.6%	6.6%
Agency ownership					
Public	9,043	65.6%	51.7%	23.1%	7.9%
Religious Non-Profit	1,679	63.1%	50.9%	16.3%	7.7%
Private Non-Profit	16,968	56.1%	41.9%	18.8%	6.2%
Private For-Profit	59,946	57.4%	43.3%	18.3%	6.8%

Notes: BNZ – Benzodiazepine; Any med – Any prescription for an opioid, benzodiazepine or hypnotic; SNF – Skilled Nursing Facility

**Table 2**

**Rates of Controlled Medication Use by Clinical Factors**

	N	% Any Med	% Opioid	% BNZ	% Hypnotic
Total	87,780	58.1%	44.0%	18.9%	6.8%
Primary Diagnosis					
Heart failure	6,789	46.0%	29.6%	18.7%	6.7%
COPD	2,943	57.6%	35.7%	31.6%	9.2%
Stroke	3,173	42.3%	24.6%	16.7%	6.0%
Osteoarthritis	1,635	62.7%	49.7%	17.8%	6.2%
Skin wound/ulcer	3,147	53.3%	39.0%	17.5%	5.8%
Type II Diabetes	2,025	45.4%	30.8%	16.4%	7.6%
Rehabilitation: Bone fracture	2,652	67.2%	59.2%	18.3%	6.2%
Surgical aftercare	10,786	81.2%	75.8%	14.5%	7.3%
ADL Limitations					
None	21,081	54.5%	40.6%	17.7%	7.0%
Any	66,699	59.2%	45.1%	19.2%	6.7%
PHQ 2-3					
No	84,260	57.8%	44.0%	18.3%	6.6%
Yes	3,520	64.8%	44.0%	33.2%	11.6%
Poor cognitive functioning					
No	72,290	60.2%	47.1%	18.5%	7.0%
Yes	15,490	48.4%	29.3%	20.7%	5.9%
Severe Pain					
No	36,061	40.7%	22.4%	16.5%	5.4%
Yes	51,719	70.2%	59.1%	20.5%	7.8%
Obesity					
No	85,755	58.4%	44.3%	18.9%	6.8%
Yes	2,025	45.5%	30.8%	16.4%	7.6%

Notes: ADL – Activities of Daily Living; PHQ – Patient Health Questionnaire

**Table 3**  
Adjusted Association of Controlled Medication with Sociodemographic Clinical and Organizational Factors

	Any Med		Opiate		Benzodiazepine		Hypnotic	
	OR	95% CI	OR	95% CI	OR	95% CI	OR	95% CI
Age, years (Reference: 65–74 years)								
75 – 84	0.65	(0.62, 0.67)	0.63	(0.61, 0.66)	0.77	(0.74, 0.80)	0.74	(0.70, 0.79)
85+	0.42	(0.41, 0.44)	0.41	(0.40, 0.43)	0.56	(0.53, 0.58)	0.52	(0.48, 0.56)
Female	1.47	(1.43, 1.52)	1.26	(1.22, 1.30)	1.57	(1.51, 1.63)	1.29	(1.22, 1.37)
Race (Reference: White)								
Black	0.61	(0.58, 0.64)	0.81	(0.77, 0.85)	0.44	(0.41, 0.47)	0.54	(0.49, 0.60)
Asian	0.52	(0.44, 0.62)	0.66	(0.55, 0.79)	0.35	(0.26, 0.47)	0.67	(0.47, 0.96)
Other	0.66	(0.55, 0.80)	0.76	(0.62, 0.92)	0.59	(0.46, 0.75)	0.54	(0.37, 0.81)
Hispanic	0.82	(0.74, 0.92)	0.86	(0.77, 0.96)	0.68	(0.59, 0.78)	0.82	(0.67, 1.00)
Dual Eligible	1.13	(1.04, 1.23)	1.06	(0.97, 1.15)	1.22	(1.11, 1.34)	1.43	(1.25, 1.64)
Referral Source (Reference: Community)								
Hospital	1.39	(1.34, 1.44)	1.65	(1.59, 1.72)	1.02	(0.98, 1.07)	1.07	(1.00, 1.14)
SNF/Rehab	1.38	(1.33, 1.44)	1.62	(1.56, 1.69)	1.09	(1.04, 1.14)	1.27	(1.18, 1.37)
Primary Diagnoses								
Heart Failure	0.72	(0.68, 0.76)	0.64	(0.60, 0.68)	1.04	(0.97, 1.11)	1.09	(0.98, 1.21)
Stroke	0.57	(0.52, 0.61)	0.45	(0.41, 0.49)	0.84	(0.76, 0.93)	0.89	(0.76, 1.04)
Osteoarthritis	1.24	(1.11, 1.38)	1.35	(1.22, 1.51)	0.88	(0.77, 1.00)	0.93	(0.76, 1.15)
Type II diabetes	0.64	(0.58, 0.70)	0.61	(0.55, 0.67)	0.84	(0.74, 0.95)	1.13	(0.95, 1.35)
Rehabilitation: fracture	1.45	(1.33, 1.59)	2.07	(1.90, 2.26)	0.82	(0.74, 0.91)	0.86	(0.73, 1.01)
Surgery aftercare	2.54	(2.41, 2.69)	3.41	(3.24, 3.59)	0.61	(0.57, 0.65)	0.91	(0.83, 0.99)
ADL limitations	1.15	(1.13, 1.17)	1.14	(1.12, 1.16)	1.08	(1.06, 1.10)	1.03	(1.00, 1.06)
PHQ-2 > 3	1.33	(1.23, 1.43)	1.01	(0.93, 1.08)	1.95	(1.81, 2.11)	1.71	(1.53, 1.90)
Poor cognitive function	0.73	(0.70, 0.76)	0.59	(0.56, 0.61)	1.11	(1.05, 1.16)	0.91	(0.84, 0.99)
Severe pain	2.44	(2.35, 2.53)	3.04	(2.93, 3.14)	1.28	(1.23, 1.33)	1.33	(1.25, 1.40)
Obesity	1.12	(1.08, 1.17)	1.16	(1.11, 1.20)	0.89	(0.85, 0.94)	1.04	(0.97, 1.12)
Region (Reference: Northeast)								
Midwest	1.40	(1.35, 1.46)	1.65	(1.58, 1.72)	0.98	(0.93, 1.03)	1.23	(1.13, 1.33)

	Any Med		Opiate		Benzodiazepine		Hypnotic	
	OR	95% CI	OR	95% CI	OR	95% CI	OR	95% CI
South	1.65	(1.58, 1.72)	1.76	(1.68, 1.84)	1.32	(1.25, 1.39)	1.57	(1.45, 1.70)
West	1.63	(1.49, 1.78)	2.2	(2.01, 2.41)	0.95	(0.85, 1.06)	1.76	(1.52, 2.04)
Agency Ownership (Reference: Private For-Profit)								
Religious Non-Profit	1.18	(1.05, 1.31)	1.24	(1.11, 1.38)	0.86	(0.75, 0.98)	1.16	(0.97, 1.40)
Private Non-Profit	1.04	(0.99, 1.08)	1.06	(1.01, 1.10)	1.09	(1.04, 1.14)	1.03	(0.96, 1.12)
Public	1.21	(1.14, 1.28)	1.19	(1.13, 1.27)	1.21	(1.13, 1.29)	1.01	(0.92, 1.12)
Rural	1.12	(1.07, 1.17)	1.14	(1.09, 1.19)	1.02	(0.97, 1.07)	1.03	(0.95, 1.11)

Notes: BNZ – Benzodiazepine; Any med – Any prescription for an opioid, benzodiazepine or hypnotic; SNF – Skilled Nursing Facility; ADL – Activities of Daily Living; PHQ – Patient Health Questionnaire