Published in final edited form as:
Osteoporos Int. 2007 April ; 18(4): 553–559.

Prevalence and Predictors of Osteoporosis Treatment in Nursing Home Residents with Known Osteoporosis or Recent Fracture

C Colón-Emeric[1], **KW Lyles**[1], **DA Levine**[2], **P House**[3], **A Schenck**[3], **J Gorospe**[3], **M Fermazin**[4], **K Oliver**[2], **J Alison**[2], **N Weisman**[2], **A Xie**[2], **JR Curtis**[2], and **K Saag**[2]

1 *Duke University Center for Aging and Human Development, and the Durham VA GRECC, Erwin Rd, Durham NC, 27710, phone (919) 660-7500, fax (919) 684-8569.*

2 *Center for Education and Research on Therapeutics (CERTs) of Musculoskeletal Disorders, University of Alabama at Birmingham, 1530 3rd Avenue South Birmingham AL, 35294, phone (205)934-0893, fax (205) 975-6859.*

3 *Carolinas Center for Medical Excellence, Cary, NC*

4 *Health Services Advisory Group, Phoenix, AZ*

Abstract

Introduction and Hypothesis: We determined the prevalence and predictors of osteoporosis evaluation and treatment in high risk nursing home residents.

Methods: We identified 67 nursing facilities in North Carolina and Arizona with >= 10 residents with osteoporosis or recent hip fracture. Medical records (n=895) were abstracted for osteoporosis evaluation (DXA, vitamin D level, serum calcium), treatment (calcium, vitamin D, osteoporosis medication, hip protectors), clinical and systems covariates. Data were analyzed at the facility level and using mixed models to account for the complex nesting of residents within providers and nursing facilities.

Results: Calcium and vitamin D was prescribed for 69% of residents, bisphosphonates for 19%, calcitonin for 14%, other pharmacologic therapies for 6%, and hip protectors for 2%. Overall, 36% received any bone protection (medication or hip protectors) with wide variation among facilities (0 to 85%). Factors significantly associated with any bone protection include female sex [OR 2.4, (1.5–3.7)] and non-urban/suburban location [1.5, (1.1–2.2)]. Residents with esophagitis, PUD, or dysphagia [0.6, (0.4–0.9)] and alcohol abuse [0.2, (0.0–0.9)] were less likely to receive treatment.

Conclusions: There is substantial variation in the quality of osteoporosis treatment across nursing homes. Interventions which improve osteoporosis quality of care are needed.

Keywords

Osteoporosis; Nursing Homes; Quality Assurance

BACKGROUND

Osteoporotic fractures remain a significant problem among nursing home residents. Osteoporosis is highly prevalent in this population, with approximately 50% of men and 64–90% of women meeting World Health Organization criteria on central or peripheral DXA.

Corresponding Author: Cathleen S. Colón-Emeric, MD, MHSc, Box 3003 Duke University Medical Center, Durham, NC 27710, Phone: (919) 660-7517 Fax: (919) 684-8569, E mail:.

[1–3] Vitamin D deficiency is similarly endemic, with 60% of nursing home residents having levels of 25,OH Vitamin D of <20 ng/ml.[4] Fractures occur at a rate of more than 10 fractures/100 residents/yr, and impose a substantial physical and financial burden to both patients and society.[5,6]

Despite the high burden of osteoporosis in nursing homes, several studies have suggested that osteoporosis screening[7] and therapies[8–10] are underutilized in the nursing home population. These studies have been limited by including all women regardless of fracture risk [8], examining only calcium and vitamin D use[9], or using only ICD-9 codes to determine co-morbidities that might impact prescribing[10]. Limited data exist for residents with a recent fracture, a clear indication for prescription of osteoporosis therapy. Moreover, little is known about the predictors of receipt of osteoporosis therapies, and this knowledge may guide efforts to improve the quality of osteoporosis care in nursing facilities.

There is evidence to suggest that such therapies are indicated in nursing home residents. Pharmacologic therapies have effects on markers of bone turnover and bone mineral density that are comparable to community-dwelling women, and that bisphosphonates can be safely administered to nursing home residents without excess gastrointestinal symptoms.[11,12] Meta-analyses support the use of calcium and vitamin D supplementation to prevent hip fracture in nursing facilities.[13] Although evidence about the efficacy of external hip protectors is conflicting, a small benefit was observed in a recent meta-analysis[14], suggesting another possible means of fracture protection in this population. Groups developing clinical practice guidelines and quality indicators for the nursing home have suggested that osteoporosis evaluation and treatment is indicated for residents at high risk for fracture, including those with known osteoporosis or previous fracture.[15,16]

We sought to measure the use of osteoporosis evaluation and treatment strategies in nursing home residents with known osteoporosis or recent fracture in two U.S. states, and to determine what clinical and systems factors were associated with receipt of any fracture prevention therapy.

METHODS

Facility selection

This project included two, independent studies of osteoporosis care in nursing homes that were designed to have identical inclusion criteria and baseline data collection so that analyses could be combined. The Duke University Medical Center and University of Alabama at Birmingham Institutional Review Boards approved all study procedures.

In collaboration with the Quality Improvement Organizations of Arizona and North Carolina, we used Minimum Data Set (MDS) data to identify nursing homes with at least 10 residents diagnosed with osteoporosis or a hip fracture within 180 days. Sixty seven of 249 eligible nursing homes were recruited to the study through telephone, postal mail and fax solicitation of the nursing home administrators. No financial incentives were used.

Resident selection

We identified residents aged 50 years or older with either a history of hip fracture or a diagnosis of osteoporosis on an MDS assessment during a 6 month time period (January 2003 – June 2003 in North Carolina, November 2003 – April 2004 in Arizona). MDS assessments are completed by RN-level staff using physician documentation of these diagnoses on any available clinical information, such as hospital discharge summaries, admission history and physicals, and outpatient records. In addition to having a diagnosis of osteoporosis or recent hip fracture, residents had to be ambulatory or transfer independently, and have a length of

stay of at least four weeks. We excluded residents with active cancer and/or current chemotherapy treatment, severe dementia (disorientation to all items, or cognitive skills "severely impaired" on MDS), end-stage renal disease or dialysis, total dependence or extensive assistance in physical functioning, hospice care, or estimated life expectancy ≤ 6 months. This strategy was selected in order to identify the residents who were at the highest risk for fracture, had a life expectancy sufficient to benefit from osteoporosis treatment, and had opportunity for osteoporosis evaluation and treatment during their nursing home admission. A total of 895 residents meeting these criteria were identified. All eligible residents in N.C. were included (n=578). Because of the larger average number of beds in AZ homes, those with >20 residents meeting criteria had 20 residents randomly selected for abstraction to improve study efficiency (n=317).

Data collection

Covariates were selected using clinical observation and literature review, and were obtained from administrative and medical record data sources. Table 3 contains all abstracted co-morbidities, except for rheumatoid arthritis, systemic lupus erythematosis, and hyperparathyroidism. These were identified in <2% of subjects and were omitted from the table and models.

Administrative data

Nursing home characteristics including bed size, for-profit status, location, and payer sources were obtained from public-use datasets (http://www.medicare.gov/NHCompare/). MDS data was used for some clinical variables (age, sex, ambulatory status, falls, cognitive impairment, renal insufficiency).

Medical Record Abstraction

Trained data collectors abstracted data for clinical variables including co-morbidities, osteoporosis evaluation and treatment using a computerized tool. Data collectors reviewed medical records for medication prescriptions or receipt of osteoporosis therapies in a 6-month time period beginning at the first time a fracture or osteoporosis diagnosis was recorded in the MDS. The entire medical record was reviewed for bone mineral density testing and laboratory testing. An order for testing or treatment, even if never received by the resident, was counted as use. Osteoporosis medication discontinuation information was also recorded. A random 10% of charts was re-abstracted by a second data collector, and inter-rater reliability was maintained at >90% concordance.

Main Outcome Measures

Osteoporosis evaluation (bone mineral density measurement, 25,OH Vitamin D measurement, and serum calcium measurement) and osteoporosis treatment (calcium and vitamin D supplementation, pharmacologic therapies including bisphosphonates, calcitonin, teriparatide, raloxifene, hormone replacement therapy, and hip protectors) were the main outcome measures.

Analysis

Data were analyzed at the facility level. The use of osteoporosis evaluation and treatment was described using simple statistics. Univariate comparisons between states were made using t-tests. In order to determine which facility and clinical covariates were associated with receipt of osteoporosis therapy, GEE models were constructed with backwards selection. This method accounted for the complex nesting of residents within providers and nursing facilities. All variables found to be associated with any osteoporosis therapy in bivariate analyses at the 0.10 level were included in final model. We also forced age and race into the model because of their

clinical significance, although they were not significant on univariate analyses. Goodness of fit was assessed using an extension of the Hosmer and Lemeshow statistic for ordinary logistic regression to marginal regression models for repeated binary observations.[17] This test has been proposed to assess the adequacy of fitted GEE models, with p values >0.05 indicating "good" fit.

RESULTS

Characteristics of the 67 study facilities and 895 study residents are listed in table 1. All AZ facilities were located in an urban or suburban area (defined as located within 10 miles of a city of ≥10,000 inhabitants), while a mixture of urban/suburban and non-urban facilities were enrolled in NC. Residents in AZ were slightly younger and were more likely to have had a fall in the last 90 days, to have a diagnosis of GERD, and to have a history of tobacco use. However, the differences were relatively small. Participating facilities were similar to nonparticipating facilities in bed size (mean 127 beds) and for-profit status (77%). However, as compared to non-participating facilities, participating facilities were more likely to be located within a hospital (7.6% vs.2.2%, p=0.04) and less likely to be part of a chain (54.6% vs. 76.4%, p=0.002).

Among nursing home residents with osteoporosis or recent fracture, the frequency of osteoporosis treatment was moderate for calcium (69%) and vitamin D (63%) but low for other pharmacologic therapies. Bisphosphonates were prescribed to 19% and calcitonin to 14%; other osteoporosis medications were prescribed to less than 5% of the cohort. (Figure 2) Any fracture protection, defined as use of a pharmacologic osteoporosis therapy or hip protectors but excluding calcium and vitamin D, was provided to 36% of residents. There was considerable variation in osteoporosis treatment across facilities, with osteoporosis treatment ranging from 0% to 85% of residents (Figure 1), but no significant differences between the 2 states.

Osteoporosis treatment was discontinued in 7% of residents in whom it was prescribed during the study period with the following discontinuation rates by specific therapy: HRT (14.3%), bisphosphonates (5.4%), calcitonin (7.5%), and calcium (1.3%). The reasons for discontinuation were documented infrequently (14%), however patient or family preference was documented in 8%, clinical status change in 3%, and adverse reaction in 3%.

In multivariate analyses with the combined population, homes with a non-urban/suburban location (OR 1.5, 95% CI 1.1–2.2) were more likely to provide any fracture protection. Women were more likely to receive fracture protection (2.4, 1.5–3.7), while residents with history of peptic ulcer disease or esophagitis (0.6, 0.4–0.9), dysphagia (0.6, 0.4–0.9), and alcohol abuse (0.2, 0.0–0.9) were less likely to receive therapies.(Table 3) Length of stay also added to the model but was not significant. To check the goodness of fit of our reduced GEE model, Horton's method was used and the model was a good fit with p=0.08.[17]

DISCUSSION

We demonstrated that among ambulatory or transfer-independent nursing home residents with osteoporosis or recent hip fracture and no documented life-threatening illnesses, use of osteoporosis evaluation and treatment other than calcium and vitamin D supplementation was generally low. Moreover, there was substantial variation between facilities, suggesting that improvement in care was possible. The level of use we observed is comparable to previous studies in the general nursing home population [8,10] and extends knowledge in this area by including only the highest risk residents, and measuring both systems and clinical factors

associated with of osteoporosis therapy use that are not available in large administrative databases.

These factors include clinical variables which might reasonably limit the use of bisphosphonates, such as peptic ulcer disease, dysphagia, and esophagitis. Physicians appear to be less likely to consider or treat osteoporosis in men, even when they have had a recent fracture. Heavy alcohol use was associated with less osteoporosis therapy, perhaps due to its known associations with gastritis, varices, or other severe co-morbidities that may influence physicians' decisions to prescribe a bisphosphonate. It is unclear why non-urban/suburban facilities more often provided osteoporosis therapy, but this finding may reflect differences in practice characteristics. Physicians in non-urban areas may be more likely to care for their primary care patients in the local nursing facility compared to urban physicians; we have previously found that physicians are less willing to provide osteoporosis care for patients that they will not be following long-term[18]. It is interesting that many factors traditionally associated with under-use of therapies, such as for-profit institutions, insurance status, race, and age, did not appear to influence prescription of osteoporosis therapies in our study.

There are several factors we speculate may have influenced the practice pattern variability we observed in our study. The likelihood of systematic differences in medical record documentation of osteoporosis therapy is relatively low given regulatory requirements for medication order and administration records in nursing facilities, although it is possible that facilities may differ in their documentation of hip protector use, which does not always require a physician order. There may be systematic differences in resident co-morbidities and life expectancy between facilities, though we tried to minimize this by requiring a uniform resident selection criteria, and adjusting for a number of these factors in our multivariate model. Previous work suggests that there may be systematic differences in patient and family preferences and compliance with medications across different homes.[18,19] However, the magnitude of the variability we observed suggests that there are also substantial differences in provider practice patterns around osteoporosis care. This provides an opportunity to intervene and change provider behavior to better reflect current osteoporosis practice guidelines.

It is challenging to define the "right" level of osteoporosis evaluation and treatment in this population. We recognize that clinical decision making in nursing home residents is far more complex than can be deduced from a cross-sectional study. We could not identify residents who had previously been on and failed therapy, or who declined therapy. Nevertheless, we selected the patients at highest risk for fracture who are most likely to benefit from therapy based on current evidence. Current guidelines support treatment for the patients with a history of low trauma fracture without BMD testing since obtaining a DEXA can be logistically problematic in nursing homes. On the other hand, the high prevalence of vitamin D deficiency previously described in both nursing home and hip fracture patients suggests that this treatable problem was likely under-recognized in our study sample. The low level of fracture protection overall, combined with the high variability between facilities, suggests that there is much room for improvement in osteoporosis care in many of these nursing facilities.

Despite its many strengths, our study is limited by a non-random selection of nursing homes from only 2 states, and the quality of information available in medical record review. We relied on a diagnosis of osteoporosis or hip fracture on the MDS to define our high risk population, and the accuracy of these items are unknown; however, since they are based on physician documentation in the clinical record, it is likely to be a fairly specific but insensitive marker for true osteoporosis. Despite these limitations, we believe that this study had sufficient power to define the use of osteoporosis therapy in the highest risk group, and to identify factors that are associated with use or nonuse. Such information is vital to begin improving the secondary prevention of fractures in frail nursing home residents.

We conclude that osteoporosis evaluation and therapy in nursing home residents at the highest risk for fracture is highly variable, and only partly explained by resident co-morbidities. Interventions to improve the quality of care for nursing home residents with osteoporosis are needed.

Acknowledgements

Supported by the Alliance for Bone Health, and the Center for Education and Research on Therapeutics of Musculoskeletal Disorders AHRQ 3U18HS10389-06S1. Dr. Colón-Emeric is supported by a Paul A. Beeson award K23 AG024787. The analyses upon which this publication is based were performed under Contract Number 500-02-AZ02 AZ0020, funded by the Centers for Medicare & Medicaid Services (CMS), an agency of the U.S. Department of Health and Human Services. The content of this publication does not necessarily reflect the views or policies of the Department of Health and Human Services, nor does mention of trade names, commercial products, or organizations imply endorsement by the U.S. Government. The author assumes full responsibility for the accuracy and completeness of the ideas presented. Publication No. AZ-8SOW-SS-061206-01.

References

1. Zimmerman S, Girman C, Buie, et al. The prevalence of osteoporosis in nursing home residents. Osteopros Int 1999;9(2):151–7.
2. Sallin U, Mellstrom D, Eggersten R. Osteoporosis in a nursing home, determined by the DEXA technique. Med Science 2005;11(2):CR67–70.
3. Toofanny M, Maddens M, Voytas J, Kowalski K. Low bone mass and postfall fracture risk among elderly nursing home men. J Am Med Dir Assoc 2004;5(6):367–70. [PubMed: 15530173]
4. Elliot M, Binkley N, Carnes M, et al. Fracture risks for women in long-term care: high prevalence of calcaneal osteoporosis and hypovitaminosis D. Pharmacother 2003;23(6):702–10.
5. Chandler J, Zimmerman S, Girman C, et al. Low bone mineral density and risk of fracture in white female nursing home residents. Arch Int Med 2000;162(13):1502–8. [PubMed: 12090887]
6. Zimmerman S, Chandler J, Hawkes W, et al. Effect of fracture on the health care use of nursing home residents. Arch Int Med 2002;162(13):1502–8. [PubMed: 12090887]
7. Gupta G, Aronow W. Underuse of procedures for diagnosing osteoporosis and of therapies for osteoporosis in older nursing home residents. J Am Med Dir Assoc 53:200–2.
8. Jachna C, Shireman T, Whittle J, et al. Differing patterns of antiresorptive pharmacotherapy among nursing facility residents and community dwellers. J Am Geriatr Soc 2005;53(8):1275–81. [PubMed: 16078951]
9. Kamel H. Underutilization of calcium and vitamin D supplements in an academic long-term care facility. J Am Med Dir Assoc 2004;5(2):98–100. [PubMed: 14984620]
10. Rojas-Fernandez C, Lapane K, MacKnight C, Howard K. Undertreatment of osteoporosis in residents of nursing homes: population based study with use of the Systematic Assessment of Geriatric Drug Use via Epidemiology (SAGE) Database. Endo Prac 2002;8(5):335–42.
11. Greenspan S, Schneider D, McClung M, et al. Alendronate improves bone mineral density in elderly women with osteoporosis residing in long-term care facilities. A randomized, double-blind, placebo-controlled trial. Ann Int Med 2002;136(10)
12. Hansdottir H, Franzson L, Prestwood K, Sigurdsson G. The effect of raloxifene on markers of bone turnover in older women living in long-term care facilities. J Am Geriatr Soc 2004;52(5):779–83. [PubMed: 15086661]
13. Avenell A, Gillespie W, Gillespie L, O'Connell D. Vitamin D and vitamin D analogues for preventing fractures associated with involutional and post- menopausal osteoporosis. Cochrane Database Syst Rev. 2006;(1)
14. Parker M, Gillespie W, Gillespie L. Hip protectors for preventing hip fractures in older people. Cochrane Database Syst Rev. 2006;(1)
15. Saliba D, Solomon D, Rubenstein L, et al. Quality indicators for the management of medical conditions in nursing home residents. J Am Med Dir Assoc 2005;6(3 Suppl):S36–48. [PubMed: 15890294]
16. American Medical Directors Association. Clinical Practice Guidelines. Osteoporosis; Columbia, MD: 2003.

17. Horton N, Bebchuk J, Jones C, et al. Goodness-of-fit for GEE: an example with mental health service utilization. Statistics in Med 1999;18:213–22.

18. Colón-Emeric C, Casebeer L, Saag K, et al. Barriers to providing osteoporosis care in skilled nursing facilities; perceptions of medical directors and directors of nursing. J Am Med Dir Assoc 2004;5:361–6. [PubMed: 15530172]

19. Solomon D, Avorn J, Katz J, et al. Compliance with osteoporosis medications. Arch Int Med 2005;165 (20):2414–9. [PubMed: 16287772]

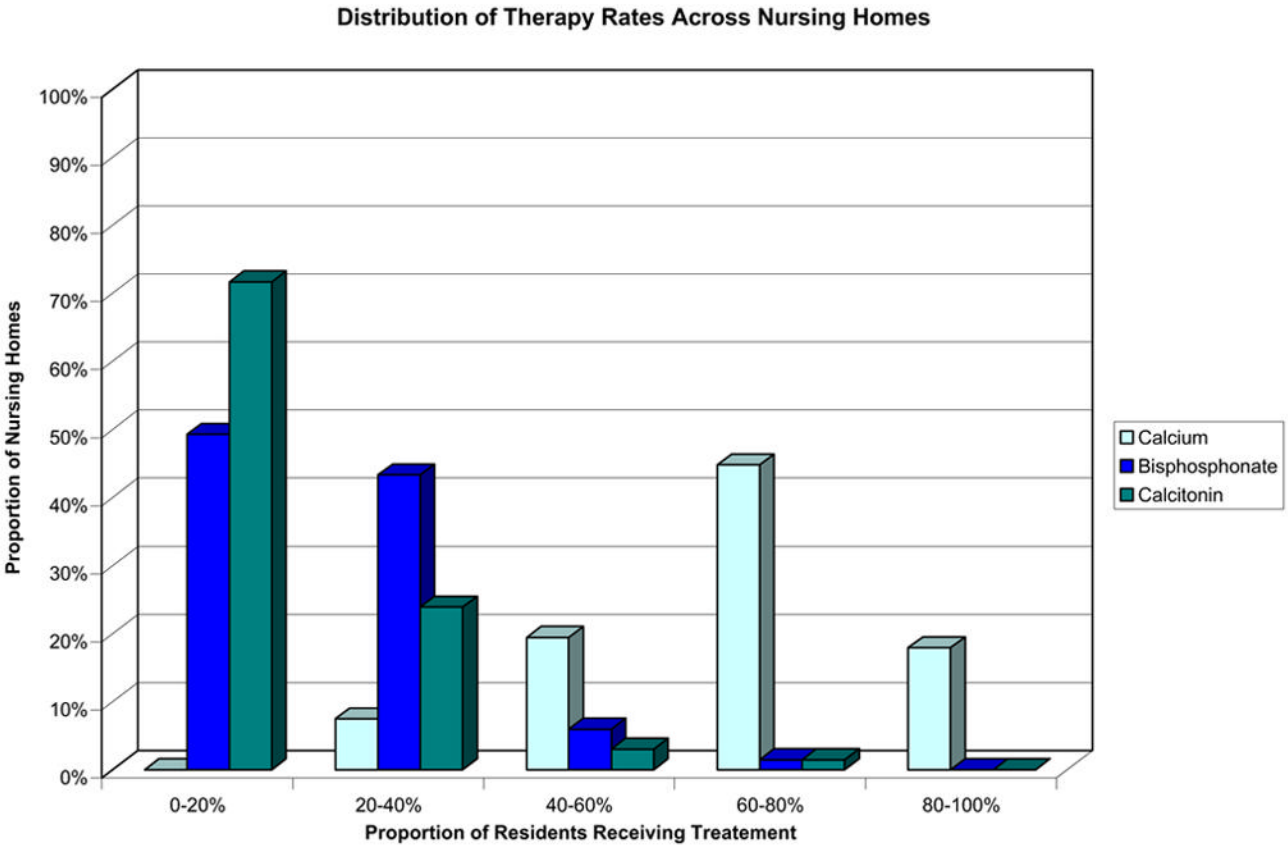

Figure 1.
Proportion of nursing homes (n=67) providing the indicated level of treatment with calcium, bisphosphonates, and calcitonin.

Table 1

Characteristics of study nursing homes and residents in the combined population and by state.

	Nursing Facility Characteristics			
	Combined (n=67)	Arizona (n=25)	North Carolina (n=42)	P value*
For profit, % (count)	79.1 (53)	80 (20)	78.6 (33)	0.89
Bed size, mean (s.d.)	124.6 (53.7)	139.8 (63.8)	115.6 (45.2)	0.10
Non-urban/suburban location, % (s.d.)	22.4 (42.0)	0 (0)	35.7 (48.5)	0.0001
	Resident Characteristics			
	Combined (n= 895)	Arizona(n=317)	North Carolina (n=578)	P value*
Women, % (s.d.)	84.1 (13.1)	80.1 (16.3)	86.4 (10.3)	0.06
Race, % (s.d.)				
Caucasian	90.9 (12.9)	90.9 (12.6)	90.8 (13.3)	0.98
African American	5.5 (9.3)	2.8 (5.1)	7.1 (10.9)	0.07
Other	3.7 (7.1)	6.3 (9.7)	2.1 (4.3)	0.02
Age, mean (s.d.)	85.4 (3.6)	84.2 (3.9)	86.2 (3.2)	0.03
Insurance status				
Medicare, % (s.d.)	41.4 (21.4)	37.5 (25.6)	43.7 (18.4)	0.30
Medicaid	30.5 (20.7)	27.4 (23.1)	32.4 (19.2)	0.37
Private insurance	10.4 (14.2)	12.9 (15.2)	9.0 (13.5)	0.29
Resident ambulatory, % (s.d)	77.2 (14.9)	80.1 (15.3)	75.5 (14.6)	0.23
Falls in last 90 days, % (s.d)	50.4 (19.0)	58.6 (18.0)	45.4 (18.0)	0.01
Cognitive impairment, % (s.d)	58.8 (17.7)	56.2 (19.2)	60.3 (16.8)	0.37
Sever renal insufficiency, % (s.d)	0.7 (2.4)	1.2 (3.0)	0.4 (0.2)	0.15
Reflux, % (s.d)	30.9 (18.4)	38.7 (19.6)	26.2 (16.0)	0.01
Peptic ulcer disease or Esophagitis, % (s.d)	9.9 (9.4)	8.7 (7.3)	10.7 (10.6)	0.36
Breast cancer,* % (s.d)	3.9 (7.1)	4.5 (8.3)	3.4 (6.3)	0.57
Dysphagia, % (s.d)	11.6 (11.5)	8.3 (9.8)	13.5 (12.1)	0.06
Thromboembolic disease,% (s.d)	7.1 (6.8)	7.8 (7.7)	6.7 (6.2)	0.56
Tobacco use, % (s.d)	13.2 (13.8)	18.6 (14.2)	9.9 (12.6)	0.02
Alcohol abuse, % (s.d)	2.3 (4.7)	2.8 (5.3)	2.0 (4.4)	0.52

* Women only

Table 2

Mean proportion of residents in each facility (n=67) with documented osteoporosis evaluation or treatment.

	% (Standard Deviation) n=67 homes
Evaluation	
BMD measurement	1.2 (3.0)
Serum Calcium leve	59.7 (20.9)
25(OH) Vitamin D level	0.1 (1.2)
Treatment	
Calcium	69.2 (18.9)
Vitamin D	62.8 (22.0)
Bisphosphonate	19.1 (13.4)
Calcitonin	14.4 (13.6)
Raloxifene	3.2 (5.5)
Teriparatide	0.1 (1.2)
HRT (women)	3.1 (4.6)
Testosterone (men)	0.0 (0.0)
Hip Protectors	2.1 (9.0)
Physical Therapy	53.7 (21.0)
Any fracture protection[†]	35.7 (17.5)

[†]Any fracture protection defined as either an approved osteoporosis medication or hip protectors, but not including calcium or vitamin D. BMD = bone mineral density measurement, HRT = hormone replacement therapy.

Table 3

Clinical factors and nursing facility characteristics associated with receipt of any fracture prevention for the combined population

	Proportion or residents receiving any fracture protection (n)	Multivariate OR (95% CI)
For-profit status	35% (720)	0.94 (0.69–1.27)
Bed size 8–92 93–120 121–163 163–248	42% (220) 29% (188) 36% (262) 34% (225)	1.00 (0.99–1.00)
Medicare	35% (248)	1.09 (0.78–1.52)
Non-urban/suburban location	44% (191)	1.53 (1.07–2.20)
Female gender*	39% (753)	2.36 (1.51–3.68)
Caucasian race*	37% (814)	1.48 (0.87–2.52)
Age* <70 70–79 80–89 ≥90	28% (50) 37% (136) 37%(426) 35% (283)	0.99 (0.97–1.01)
Cognitive Impairment*	33% (524)	0.88 (0.65–1.19)
Resident ambulatory*	33% (687)	0.80 (0.52–1.21)
Falls in last 90 days*	33% (460)	0.79 (0.58–1.06)
Renal insufficiency*	17% (6)	0.36 (0.03–3.71)
GERD†	38% (273)	1.20 (0.92–1.58)
PUD or Esophagitis†	28% (92)	0.60 (0.40–0.91)
Dysphagia†	27% (107)	0.58 (0.37–0.91)
Breast cancer†	29% (31)	0.59 (0.25–1.41)
Endometrial cancer†	33% (6)	0.50 (0.09–2.65)
Thromboembolic disease†	38% (65)	1.30 (0.78–2.11)
Tobacco use / abuse†	35% (115)	1.02 (0.66–1.59
Alcohol abuse†	10% (21)	0.19 (0.04–0.92)

*Measured by the MDS,

†Measured by chart abstraction