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Impact of a Geriatric Nursing Home Palliative Care Service on Unnecessary Medication Prescribing

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Abstract

Background—Studies on improving medication use in palliative care patients in nursing homes are lacking.

Objective—To determine whether a geriatric palliative care team reduces unnecessary medication prescribing for older veteran nursing home patients.

Methods—This was a retrospective, descriptive study of patients who died on the Geriatric Palliative Care Unit between August 1, 2005 and July 31, 2007. We used the Unnecessary Drug Use Measure, which contains the three questions on indication, effectiveness, and duplicate therapy from the reliable and valid Medication Appropriateness Index. This measure was evaluated at two points in time: 1) upon transfer/admission to the palliative care unit, and 2) the last 30-day pharmacist medication review prior to death. Paired t-tests and McNemar's tests were utilized to compare medication use at the two points in time.

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Results—Eighty-nine patients were identified for this study. A majority of patients were male (97.8%) and white (78.7%). The median length of stay on the unit was 39.0 days, and the average number of chronic medical conditions was 8.4. At baseline, the number of scheduled medications was 9.7 ± 4.3. The number of unnecessary medications decreased from 1.7 ± 1.5 at admission to 0.6 ± 0.8 at close-out (p=0.003), and the decrease was seen in all three categories of the Unnecessary Drug Use Measure.

Conclusion—A geriatric palliative care team reduced the number of unnecessary drugs taken by older veteran nursing home patients. Future studies should be conducted to assess the impact of decreasing unnecessary prescribing on clinical outcomes such as adverse drug reactions.

Keywords

palliative care; unnecessary drug use; medication appropriateness index; geriatrics

INTRODUCTION

Currently, 20 percent of older adults die in a nursing home, and this is estimated to climb to 40% by 2020.[1] Given this trend, the availability of hospice care in nursing homes is increasing. The overwhelming majority of hospice patients (81%) are aged 65 or greater, and while cancer still remains the most common primary diagnosis, heart disease and dementia account for nearly one quarter of the diagnoses. More emphasis is being placed on the use of palliative care outside of hospice programs because these non-cancer diagnoses have a less predictable downward trajectory. Palliative care seeks to prevent, relieve, reduce, or soothe the symptoms of a disease or disorder without affecting a cure, and it does not require that a patient have a six month or less life expectancy.[1]

There are studies examining the impact of hospice care on prescribing for end of life symptoms. (For example, the results are mixed with regard to the effect of hospice care on pain management in nursing homes.) In addition to addressing symptoms at the end of life, an innovative framework for discontinuing medications in those with a limited life expectancy was recently developed.[5] The model includes four areas of consideration for appropriate prescribing: life expectancy; time until benefit from the medication; goals of care (e.g., palliative, curative); and treatment target (e.g., symptom management, preventive).[5] Previous successful strategies for reducing polypharmacy and/or unnecessary medication use in the elderly include an acute care geriatric evaluation and management team,[6] an interdisciplinary team in nursing home care,[7] a geriatric-palliative care algorithm,[8] and a consultative community and hospital based palliative care service.[9] In the one study in nursing homes, interdisciplinary team care resulted in the reduction of unnecessary medications per patient from 1.57 at admission to 0.34 at closeout.[7] The nation’s largest integrated health care system, the Veterans Affairs (VA) Healthcare System, is intensely interested in optimizing care at the end of life and has greatly expanded its hospice and palliative care services, including those for older adults residing in nursing homes.() Although the literature contains strategies to enhance prescribing in the elderly, specific studies on improving medication use in palliative care patients in nursing homes are lacking.

In 2004, the VA Pittsburgh Healthcare System opened a 40 bed geriatric palliative care unit in its nursing home; care was provided by an interdisciplinary team. Two of the most important clinical goals of the team were to provide drug therapy for treatable conditions, while also reducing medications that may not impact quality of life given the veteran's limited life expectancy. Therefore, the objective of this study was to determine whether a geriatric palliative care team reduces unnecessary medication prescribing for older veteran nursing home patients.

METHODS

Study design, setting, and sample

This was a retrospective descriptive study of patients cared for in the geriatric palliative care unit of the H.J. Heinz III Progressive Care Center, which is part of the VA Pittsburgh Healthcare System (VAPHS). Patients were included in the study if they died on the palliative care unit between August 1, 2005 and July 31, 2007. This study was reviewed by the Institutional Review Board at the VAPHS and granted exempt status.

Interdisciplinary Geriatric Palliative Care Unit and Team

In 2004, the VAPHS approved a new clinical demonstration project designed to provide palliative care for older veterans near the end of life, but the patients did not necessarily meet hospice criteria of six months or less to live. Patients are admitted to the geriatric palliative care unit via several routes (e.g., referral from their primary physician or medical team at the acute care hospital or another nursing home), but all are triaged through a communication center that is staffed by nurses, who have the criteria for admission. Some patients are admitted to the unit for a brief stay, and then return home (e.g., respite care). Therefore, not all patients die on the unit. The average daily census is approximately 35, and the unit includes patients with cancer and non-cancer diagnoses.

In order to optimize care for these veterans, a primary care team approach is utilized. The unit is staffed by specialists in behavioral health, chaplaincy, geriatric medicine, nursing, nutrition, palliative medicine, pharmacy, physical medicine and rehabilitation, physician extension, and social work. The overall clinical goals of the interdisciplinary geriatric palliative care team are to: 1) clarify goals of care; 2) develop advanced directives; 3) preserve functional status; 4) reduce sensory impairment; 5) treat end of life symptoms (e.g., pain, delirium, depression, dyspnea, gastrointestinal symptoms); and 6) reduce polypharmacy by eliminating medications that may not impact quality of life. The team develops individualized goals of care that are consistent with the veteran's wishes given the disease process and prognosis.

Data Collection

Utilizing the computerized patient record system, a trained clinical pharmacist, not involved in the care of the patients (Dr. Suhrie), created a chart abstract for each patient consisting of data from the most recent admission to the geriatric palliative care unit until death. Data collected included age, race, sex, the most recent discharge summary, bar code medication administration (BCMA) record prior to transfer or the list of outpatient medications, medical

problem list, admission history and physical examination note from the attending physician, physician/physician assistant progress notes, consultations, diagnostic test results (including laboratory and radiographic tests), a list of chronic medical conditions, drug regimen reviews by the pharmacist, BCMA list for the last 30-day drug review by the pharmacist prior to death and the date of the list, and vital signs around the date of admission/transfer.

Assessment of Unnecessary Medication Use

Unnecessary medication prescribing was assessed using the Unnecessary Drug Use Measure, which contains three items from the Medication Appropriateness Index (MAI).[11] The three specific domains were lack of indication, lack of effectiveness, and therapeutic duplication. For each domain, the index has specific definitions, instructions for rating the item as appropriate (A), marginal (B), or inappropriate (C), and examples. For example, an inappropriate rating for indication would be a patient taking iron without a diagnosis of iron deficiency anemia. Prescribing amitriptyline for depression would be rated as inappropriate for the effectiveness domain because less risky, equally effective antidepressants are available. Lastly, the definition of unnecessary duplication was the non beneficial or potentially dangerous copying of drug(s). Unnecessary duplication exists when two drugs from the same chemical or pharmacological class are prescribed simultaneously. The instructions for therapeutic duplication ask the rater to use the VA Medication Classification System to determine if two or more drugs are from the same chemical class. An example of therapeutic duplication would be the prescribing of two benzodiazepines (temazepam 15mg at bedtime and diazepam 2 mg three times a day). However, the use of acetaminophen and morphine (two analgesics) would not be considered therapeutic duplication because they are from different chemical classes.

These three items that comprise the Unnecessary Drug Use Measure, lack of indication, lack of effectiveness, and therapeutic duplication, have been found to have good inter- and intra-rater reliability, face validity, and feasibility when applied to medications used by patients.[11-15] A clinical pharmacist (Dr. Suhrie) was trained in the proper use of this instrument by its developer (Dr. Hanlon). Dr. Suhrie reviewed the chart abstracts, applied the three items from the MAI to the chronic medications for each patient, and rated each item as appropriate (A), marginal (B), or inappropriate (C). These evaluations were done upon transfer/admission to the palliative care unit and at the time of the last 30 day pharmacist medication review just prior to death (i.e., close-out). In those patients with less than a 30 day stay, the second evaluation was performed using the pharmacist medication review that was conducted within 30 days of admission. All patients had a medication review prior to death. To ensure that the three items of the MAI were applied consistently, Dr. Hanlon verified the accuracy of the application by re-evaluating every tenth patient.

Statistical Analysis

Descriptive statistics were reported as the mean ± standard deviation and percentages for the characteristics of the patients. For purposes of analysis, unnecessary drugs were determined by a continuous measure of the number of medications that had no indication, were ineffective, or had evidence of therapeutic duplication as defined by the specific criteria of the Medication Appropriateness Index.[11] Paired t-tests were used to compare unnecessary

drug use at the two points in time. To compare the prevalence of unnecessary drug use according to each of the three criteria at the two points in time, McNemar's tests were conducted. We also described the most common unnecessary medications using the VA Medication Classification System. SAS® software 9.1 (Cary, North Carolina) was utilized for all analyses.

RESULTS

There were eighty-nine patients on the palliative care unit who died between August 1, 2005 and July 31, 2007. Table 1 presents the characteristics of the patients on admission. Most of the patients were male, white, and had a mean age of 79.7 years (± 7.8). The most common primary diagnosis on admission to the palliative care unit was dementia (39.3%); this was followed by cancer (16.9%) and cardiovascular/cerebrovascular disease (e.g., heart failure, stroke) (11.2%). The average number of chronic medical conditions was 8.4 (± 4.3), and the average number of scheduled medications was 9.7 ± 4.3. Length of stay was highly variable (median 39.0; range 2-1185 days).

The number of unnecessary medications decreased from an average of 1.7 ± 1.5 to 0.6 ± 0.8 per patient ($p=0.003$) when evaluated with the criteria in the Unnecessary Drug Use Measure. Table 2 depicts the prevalence of unnecessary drug use by the individual criteria (effectiveness, indication, or duplication) at both admission and close-out. A decrease in unnecessary prescribing was demonstrated in all three categories between the two points in time, but the results were statistically significant only for indication and effectiveness ($p<0.05$). There was no statistically significant correlation between length of stay and reduction of unnecessary drugs ($p=0.11$).

The drug classes most commonly evaluated as unnecessary are shown in Table 3. Gastrointestinal (GI) agents (e.g., docusate), followed by vitamins, central nervous system (CNS) (e.g., antipsychotics), endocrine (e.g., insulin), and antithrombotic agents (e.g., heparin) were most frequently classified as unnecessary. The use of all of these drug classes decreased from admission to close-out.

DISCUSSION

To our knowledge, this is the first study to examine the impact of a geriatric palliative care team on unnecessary drug use in palliative care nursing home patients. Specifically, unnecessary drug use was reduced by nearly two thirds between the time of admission to the unit to close-out according to the criteria in the Unnecessary Drug Use Measure. These data confirm that one of the most important clinical goals of the interdisciplinary palliative care team, reducing medications that may not impact quality of life in the short term, was met. This is consistent with a previous study by Jeffery et al., which looked at the effect of an interdisciplinary team intervention in veteran nursing home patients, found a similar reduction in the use of unnecessary medications.[7] They also measured the outcome using the same three items from the MAI. Specifically, the number of unnecessary drugs per patient decreased from 1.57 to 0.34.[7] Another study using the same measure of unnecessary drug use found that an inpatient Geriatric Evaluation and Management team

reduced the number of unnecessary medications by 0.5 per patient with no change seen in the usual care control group.[6] Our findings are also consistent with a study by Currow et al. that found consultative community and hospital based palliative care services reduced the number of medications for comorbid medical conditions by 1.1 per patient.[9] Finally, Garfinkel et al. examined the impact of a consult service that used a geriatric-palliative care approach to improve drug use in older hospitalized patients. They found that they were able to discontinue one or more medications that lacked a valid or relevant indication, given the patient's age group and disability level, in 63% of 190 patients.[8] These studies, together with our data, provide evidence that prescribing in the elderly can be improved by reviewing the need for chronic medications which require a long time until the expected benefit is achieved.

It is interesting to note which of the unnecessary medications were discontinued between admission and close-out. Provider prescribing of GI agents decreased modestly. Of the GI agents, docusate was the drug most often found to be unnecessary. One possible explanation for not discontinuing docusate is that practitioners may view this as a benign drug even though it is probably not helping the palliative care patient with chronic constipation.[16] The use of unnecessary vitamins almost completely disappeared, but the clinical effect of this change is likely to be small. The decrease in use of three other classes of medications is likely to be more clinically important. Insulin was the main drug from the endocrine category that was discontinued. Insulin is one of the top three causes of drug related adverse reactions leading to emergency room visits in the elderly.[17] By stopping this medication, serious hypoglycemic events may have been averted. Subcutaneous heparin was discontinued for most patients on admission to the palliative care unit. In certain acutely ill medical patients, thromboprophylaxis is recommended.[18] However, evidence-based guidelines are not available for patients in the palliative care setting.[19] Therefore, the decision to continue or discontinue thromboprophylaxis is often made based on an estimate of the risks and benefits in a specific patient.[19] For example, a low molecular weight heparin may be continued in a cancer patient who is bedridden, but discontinued in a patient with pulmonary disease who is still able to ambulate. In the latter case, the risk of bleeding and the discomfort of injections may outweigh the benefit. CNS agents, including antidepressants, antipsychotics, and hypnotics, are frequently associated with adverse reactions in nursing home patients.[20] By reducing the number of these medications, some adverse drug reactions might have been avoided in this frail population.

We recognize that there are several limitations to our study. First, we did not review medication prescribing in a control group. Therefore, we do not know if this same reduction in unnecessary medications would have occurred in a similar population receiving standard nursing home or palliative care as opposed to the interdisciplinary team approach. To our knowledge, there were no ongoing quality improvement initiatives at our institution that would have influenced the prescribing of these medications. Second, the investigator performing the unnecessary drug use assessment was not blinded as to whether the patient's medications were from admission to the palliative care unit or at close-out because the electronic medical record was used to obtain all of the data at once and included dates. Third, we did not evaluate underprescribing for end of life symptoms. Terminally ill patients often have uncontrolled pain, as well as other end of life symptoms, which may lead to an

increase in the total number of medications. Fourth, we do not know if any patients experienced difficulties as a result of discontinuing medications because a provider may have stopped a medication and restarted it before we reviewed the medication list at close-out. Finally, because this study was conducted at one VA facility, our results may not be applicable to other VA nursing homes and non-VA populations.

CONCLUSIONS

We found that an interdisciplinary, geriatric palliative care team reduced the number of unnecessary medications. Future studies should be conducted to assess the impact of decreasing unnecessary prescribing on clinical outcomes such as adverse drug reactions.

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References

1. Kapo J, Morrison LJ, Liao S. Palliative care for the older adult. J Palliat Med. 2007; 10:185–209. [PubMed: 17298269]
2. NHPCO Facts and Figures: Hospice care in America. National Hospice and Palliative Care Organization; 2007. serial online [July 17, 2008]
3. Kayser-Jones JS, Kris AE, Miaskowski CA, et al. Hospice care in nursing homes: does it contribute to higher quality pain management? Gerontologist. 2006; 46:325–333. [PubMed: 16731871]
4. Miller SC, Mor V, Wu N, et al. Does receipt of hospice care in nursing homes improve management of pain at end of life? J Am Geriatr Soc. 2002; 50:512.
5. Holmes HM, Hayley DC, Alexander GC, Sachs GA. Reconsidering medication appropriateness for patients late in life. Arch Intern Med. 2006; 166:605–609. [PubMed: 16567597]
6. Schmader KE, Hanlon JT, Pieper CF, et al. Effectiveness of geriatric evaluation and management on adverse drug reactions and suboptimal prescribing in the frail elderly. Am J Med. 2004; 116:394–401. [PubMed: 15006588]
7. Jeffery S, Ruby CM, Twersky J, Hanlon JT. Effect of an interdisciplinary team on suboptimal prescribing in a long-term care facility. Consult Pharm. 1999; 14:1386–1391.
8. Garfinkel D, Zur-Gil S, Ben-Israel J. The war against polypharmacy: a new cost-effective geriatric-palliative approach for improving drug therapy in disabled elderly people. IMAJ. 2007; 9:430–434. [PubMed: 17642388]
9. Currow DC, Stevenson JP, Abernethy AP, et al. Prescribing in palliative care as death approaches. J Am Geriatr Soc. 2007; 55:590–595. [PubMed: 17397439]
10. Edes T, Shreve S, Casarett D. Increasing access and quality in the Department of Veterans Affairs care at the end of life: a lesson in change. J Am Geriatr Soc. 2007; 55:1645–1649. [PubMed: 17908063]
11. Hanlon JT, Schmader KE, Samsa GP, et al. A method for assess drug therapy appropriateness. J Clin Epidemiol. 1992; 45:1045–1051. [PubMed: 1474400]
12. Hajjar ER, Hanlon JT, Sloane RJ. Unnecessary drug use in frail older people at hospital discharge. J Am Geriatr Soc. 2005; 53:1518–1523. [PubMed: 16137281]
13. Rossi MI, Young A, Maher R, et al. Polypharmacy and health beliefs in older outpatients. Am J Geriatr Pharmacother. 2007; 5:317–323. [PubMed: 18179989]
14. Spinewine A, Dumont C, Mallet L, Swine C. Medication Appropriateness Index: reliability and recommendations for future use. J Am Geriatr Soc. 2006; 54:720–722. [PubMed: 16686895]
15. Steinman MA, Landefeld CS, Rosenthal GE, et al. Polypharmacy and prescribing quality in older people. J Am Geriatr Soc. 2006; 54:1516–1523. [PubMed: 17038068]

16. Hurdon V, Viola R, Schroder C. How useful is docusate in patients at risk for constipation? A systematic review of the evidence in the chronically ill. J Pain Symptom Manage. 2000; 19:130–136. [PubMed: 10699540]

17. Budnitz DS, Shehab N, Kegler SR, Richards CL. Medication use leading to emergency department visits for adverse drug events in older adults. Ann Intern Med. 2007; 147:755–765. [PubMed: 18056659]

18. Geerts WH, Bergqvist D, Pineo GF, et al. Prevention of venous thromboembolism: American College of Chest Physicians evidence-based clinical practice guideline (8th edition). Chest. 2008; 133:381S–453S. [PubMed: 18574271]

19. Kierner KA, Gartner V, Schwarz M, Watzke HH. Use of thromboprophylaxis in palliative care patients: a survey among experts in palliative care, oncology, intensive care, and anticoagulation. Am J Hosp Palliat Care. 2008; 25:127–131. [PubMed: 18198364]

20. Gurwitz JH, Field TS, Avorn J, et al. Incidence and preventability of adverse drug events in nursing homes. Am J Med. 2000; 109:87–94. [PubMed: 10967148]

Table 1

Characteristics of Patients at Baseline (N = 89)

Characteristic	**%**
Sex (male)	97.8
Race	
White	78.7
Black	21.3
Age in years mean (sd)	79.7 (7.8)
Primary reason for admission	
Dementia	39.3
Cancer	16.9
Cardio-/Cerebrovascular	11.2
Other Mental Disorders	7.9
Neurologic	6.7
Pulmonary	6.7
Gastrointestinal	5.6
Musculoskeletal	2.2
Other	3.5
Number of chronic medical conditions mean (sd)	8.4 (4.3)
Number of scheduled medications mean (sd)	9.7 (4.3)
Length of stay in days median (range)	39.0 (2-1185)

Table 2

Prevalence of Persons with Unnecessary Drug Use by Individual Criteria (N= 89)

Variable	Admission (%)	Close-out (%)	P-value
Effectiveness	57.3	23.6	< 0.001
Indication	40.5	20.2	< 0.001
Duplication	11.2	7.9	0.55
Overall	74.2	39.3	< 0.001

Table 3

VA Medication Classes with Drugs Most Commonly Evaluated as Unnecessary

VA Medication Class	Admission (N)	Close-out (N)
Gastrointestinal	39	28
Vitamins	25	1
Central nervous system	15	7
Endocrine	15	1
Antithrombotic	10	0