



## Preventing Medication Errors in Home Care

**This practice brief highlights the results of two home health care studies on medication errors. The first study determined how often medication errors occur in home health care. The second study tested a strategy to reduce these errors. Although nearly one third of home care patients are at risk for potential medication errors, adding a simple, practical program can reduce the potential for errors. These results should encourage home care agencies to be more vigilant in monitoring medication errors and to institute programs that help prevent errors from occurring.**

### Home Care Patients Are Vulnerable to Medication Errors

Until recently, little was known about the magnitude of medication errors in home health care. The widely publicized Institute of Medicine report focused on errors in inpatient and ambulatory care settings.<sup>1</sup> A high incidence of inappropriate medication use also has been reported in studies of long-term care and older people living in the community. For example, **inappropriate medication usage by community-dwelling elderly persons has been documented to be between 12% and 40%.<sup>2</sup>** None of these studies, however, examined medication errors among the homebound population receiving home health services.

The omission of home health care is significant because the population that uses these services is a

vulnerable one. It is also a large – and growing – population. Most home care patients are elderly. Many are frail. Home care patients usually take multiple medications, which are often prescribed by more than one physician. Many live alone. Some have multiple informal caregivers; others have none. The home environment by its very nature is unstructured. These vulnerabilities make home care patients more likely to experience medication errors and associated adverse events.

**In 1998,  
8% of Medicare enrollees  
received at least one  
home health visit.<sup>3</sup>**

Despite these risks, there is currently no “best practice” for medication management in home health care (though home care agencies are required to inventory patient medications and screen for potential problems).

## Study #1 Methodology

- This study was conducted in two large home care agencies in the United States.
- Two sets of consensus-based expert panel criteria were used to identify inappropriate medication use for home care patients 65 years and older.
  - The Beers Criteria identify medications that might unnecessarily place older persons at risk of adverse drug reactions.<sup>4</sup>
  - The Home Health Criteria were developed by an expert panel to identify patients whose patterns of medication use, combined with their clinical signs and symptoms, indicated they were potentially at risk for a significant adverse event.
- Each set of criteria was applied to study data taken from admission records and a brief questionnaire completed by the admission nurses. Additional data (e.g., demographic data, history of falls) were also reviewed.

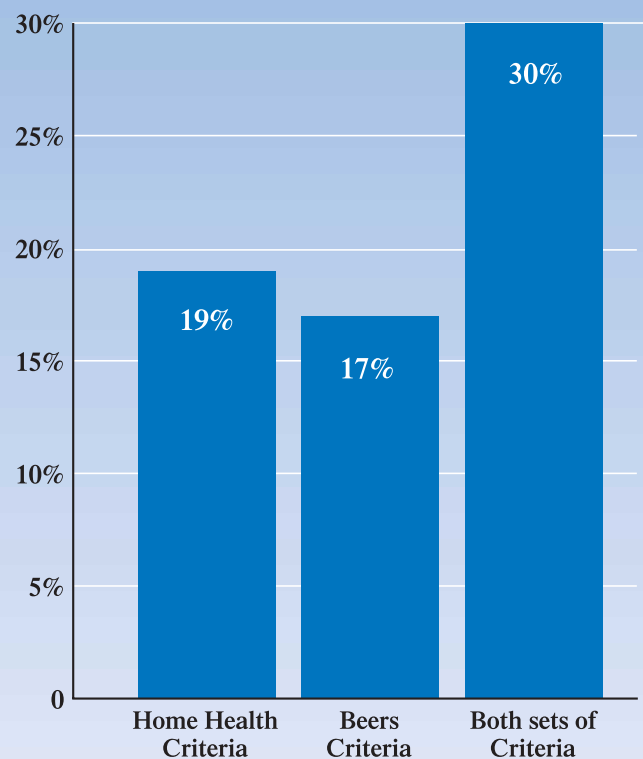
## Nearly One Third of Home Care Patients Have Potential Medication Problems

A home care patient who experiences a medication error can be at risk for a serious adverse reaction. Because adverse reactions do not always occur, however, and actual errors are difficult to calculate, the

first study looked at patterns of medication usage most likely to cause a medication error. These included:

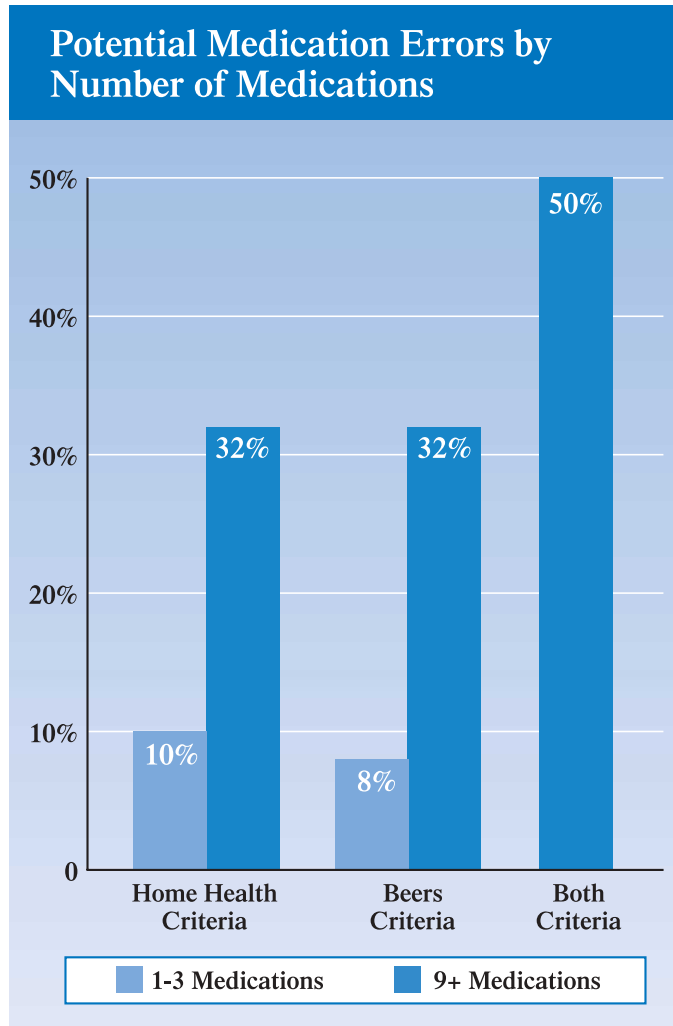
- **Inappropriate Use** – Based on the availability of better alternatives, limited evidence of efficacy, or reasonable evidence of toxicity.
- **Unnecessary Duplication** – Defined as concurrent use of two or more drugs from the same class.
- **Possible Errors for Cardiovascular Medications** – For example, poorly controlled hypertension.
- **Possible Errors for Psychotropic Drugs** – For example, use of certain antidepressant or antipsychotic drugs with signs of confusion or a fall in the past three months.
- **Possible Errors with Nonsteroidal Anti-Inflammatory Drugs (NSAIDs)** – For example, taken by people at high risk of peptic ulcer complications.

## Potential Medication Errors in Home Care Patients (Age 65+)



The study found that between 17% and 30% of home care patients 65 years and older had usage patterns that signaled “potential” medication errors. This finding is consistent with another recently published national study that showed 21.3% of community-dwelling elderly patients used potentially inappropriate medications.<sup>5</sup>

One out of five patients in the study took nine or more medications; the median number of medications taken was five. The proportion of errors increased substantially with the number of medications. There was no relationship between age and the number of medication errors.



## Medication Errors Can Be Reduced

The fact that nearly one out of every three elderly home care patients takes a medication or a combination of medications that could result in an adverse event is cause for action. The good news is that there is a way to reduce the number of patients at risk.

A practical intervention – one that requires low levels of additional resources and management – was tested in the second study to determine its ability to identify and correct potential medication problems.

### Study #2 Methodology

- This study was conducted in the same two home care agencies.
- Four of the five medication problems identified in the Home Health Criteria created for Study #1 were targeted: unnecessary therapeutic duplication, cardiovascular medication problems, psychotropic drug problems, and problems with non-steroidal anti-inflammatory drugs (NSAIDs).
- Screening data were abstracted from admission records and supplemented by a brief questionnaire completed by the admitting nurses to identify patients with one of the four targeted medication problems.
- Patients 65 years and older were randomly selected for the control and intervention groups.
- Structured interviews were conducted with the patients to collect baseline data and informed consent.
- Follow-up data were collected six weeks after randomization; up to 90 days were allowed to collect this information.

## Study #2 – Intervention Description

- A computerized screening tool was developed to identify potential medication problems based on a medication inventory and answers to signs and symptoms questions that were completed by the nurse.
- A clinical pharmacist reviewed the results of the screen to determine if additional information was needed.
- When the information was complete, the clinical pharmacist and the patient’s nurse developed a plan based on the study guidelines to present to the physician.
- The nurse then assisted the patient with any medication changes ordered by the physician and monitored their impact.
- Consultations were available with a clinical pharmacist for complex issues.

Improvement in medication use was found for both the control and intervention groups, but was higher for people who received the intervention (50% compared to 38%). **In the intervention group, medication improvements were found in twelve patients per hundred.** The effect of the intervention was greatest for patients who were taking more than one medication of the same class (“therapeutic duplication”): 71% of patients with therapeutic duplication who received the intervention experienced improvement compared to 24% of the patients who did not. **Overall, problem resolution was achieved without an increase in visits by the home care nurse or in the median length of stay.**

## Study #2 Results: Medication Improvement Rates

	Intervention Group	Control Group
<b>Any Medication Problem</b>	<b>50.0%</b>	<b>38.0%</b>
Therapeutic Duplication	70.8%	23.5%
Cardiovascular	55.0%	17.6%
Psychotropic	40.3%	31.6%
NSAIDs	42.2%	52.1%

## Home Care Agencies Need More Vigilant Monitoring of Medication Errors

Home care agencies work with a vulnerable population that is prone to medication errors simply by virtue of the sheer number of medications they are taking. Agencies now know that one out of three home care patients have a potential medication problem. Though awareness of the problem in itself may be enough to promote action, **home care agencies can begin addressing this problem by adopting a proven model of care that can be put into practice with minimal resources.** A systemic approach to improving medication management and preventing errors benefits home care agencies as well as their staff and their patients. By recognizing the problem and implementing a solution, home care agencies can promote the basic elements of safety prevention in practice.

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## The Impact on Costs and Policymakers

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In addition to improving patient safety, the medication intervention program could potentially have a positive impact on cost – by decreasing the treatment costs resulting from adverse events (e.g., from preventable strokes) and by decreasing drug costs (e.g., from harmful/duplicative drugs). **Such savings are especially critical at a time when agencies are looking to manage utilization and minimize per episode costs under PPS.** Further study will be needed to determine the extent of the possible savings.

For policy makers, these study results are a wake-up call to the vulnerability of home care patients and the importance of providing the resources to create evidence-based, practical interventions for improving patient safety in home health care.

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## Getting Started on Improving Medication Management

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Home care agencies interested in implementing this intervention can do so by following these simple steps:

- 1) Identify the focus of your medication improvement activities (specifically, which programs or teams will adopt the medication management model and which particular Home Health criteria protocols you plan to use).

- 2) Assess your agency’s capacity to program a computerized screening tool to identify potential problems based on the study formula (available from the web site below).
- 3) If such programming is not possible, consider developing another type of “trigger” or assessment tool to help staff identify the need for pharmacy review.
- 4) Contract with a local pharmacist consultant with geriatric, long-term care or home care expertise.
- 5) Train nurses on the intervention protocol and procedures, including how to be alert to potential medication issues and how to discuss them with physicians.

The free toolkit available at [www.homemedics.org](http://www.homemedics.org) under “Medications Management Models” contains further details on how to get started, including actual protocols and guidelines.

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<sup>1</sup>Institute of Medicine. *To Err Is Human: Building a Safer Health System*. Washington, DC: National Academy Press;1999.

<sup>2</sup>Zhan, C, Sangl, J, Bierman, A, et al. Potentially Inappropriate Medication Use in the Community- Dwelling Elderly. *JAMA* 2001; 286:2823-2829.

<sup>3</sup>McCall, N, Komisar, HL, Petersons, A, Moore, S. Medicare Home Health Before and After the BBA. *Health Affairs* 2001; 20(3): 189-198.

<sup>4</sup>Beers, MH. Explicit Criteria for Determining Potentially Inappropriate Medication Use by the Elderly. *Arch Intern Med* 1997; 157:1531-1536.

<sup>5</sup>McCall, 2001.

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This brief was based on the following original publications:

Brown, NJ, Griffin, MR, Ray, WA, Meredith, S, Beers, MH, Marren, J, Robles, M, Stergachis, A, Wood, AJ, Avorn, J. Model for Improving Medication Use in Home Care Patients. *The Journal of the American Pharmaceutical Association*. 1998;38(6):696-702.

Meredith, S, Feldman, PH, Frey, D, Hall, K, Arnold, K, Brown, NJ, Wayne, R. Possible Medication Errors in Home Healthcare Patients. *J Amer Geriatr Soc*. 2001;49(6):719-724.

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