

# The Effect of a Beers Criteria Tutorial on Prescribing to the Elderly in Columbia University Internal Medicine Residents

Geoff

Rubin

PGY-1

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## A. Study Purpose and Rationale

The elderly comprise 13% of the U.S. population yet consume more than 30% of all medications. About 50% of elderly patients take more than 5 medications daily and more than 10% of elderly patients take more than 10 medications daily. It has been shown that 1 in 2 people over the age of 65 take at least 1 unnecessary or inappropriate medication as defined by the Medication Appropriateness Index. This polypharmacy has previously been shown to increase inappropriate prescribing, noncompliance, adverse drug reactions, cost and morbidity and mortality. Greater than 100 billion dollars is spent annually on medication errors in the United States and there are more than 100,000 fatal drug reactions, many of which occur in elderly patients. With the aging of the baby boomer population, the aforementioned epidemiological statistics and percentages are on a trajectory to worsen. Thus, it is vital that physicians prescribe the appropriate medications to the geriatric population in order to avoid undue morbidity, mortality and suffering.

In the late 1980s, Dr. Mark H. Beers observed that antidepressants, antipsychotics and sedatives caused detrimental effects such as confusion and tremors in a nursing home population. In 1991, while at UCLA he convened a group of experts and by the Delphi method they compiled a list of medications that are inappropriate for the nursing home population due to untoward side effects or inefficacy. Since 1991, the Beers Criteria have been expanded to include all geriatric patients. It was most recently updated in 2012 and consists of three general categories: 1) medicines to avoid in all geriatric patients, 2) medicines to avoid in geriatric patients with specific syndromes (ie. CHF, constipation) and 3) medicines to use with caution in geriatric patients. The Beers Criteria have been used in many studies to retrospectively assess the trends and prevalence rate of inappropriate prescribing for elderly patients. Few studies have addressed the associations between inappropriate drug use and patient health outcomes. One study of 3372 nursing home residents showed that exposure to inappropriate drugs increased subsequent hospitalization rate and death.

Although widely referenced in the literature and utilized by geriatricians, Beers' list is not currently integrated into mainstream clinical practice. There is minimal exposure to the Beers Criteria in medical school and it is therefore unlikely that internal medicine resident physicians are familiar with the guidelines. There have been no studies evaluating the effect of exposure to the Beers Criteria on residents' prescribing practices. It is essential to see if exposure to the Beers prescription tool decreases inappropriate prescribing to the elderly, as this population comprises the majority of our patients and it is incumbent upon physicians to minimize undue iatrogenic harm. We hope this study will serve as an initial stepping stone to the eventual

implementation of a formalized resident curriculum in prescribing to geriatric patients and automated warnings about inappropriate prescribing in Eclipsis.

B. Study Design, Statistics and Procedure

a. Study Design

This study will be a one-center prospective randomized, blinded study 1 year in length in which the intervention and control groups are Columbia internal medicine house staff. The study will analyze the appropriateness of resident physicians' prescribing practices to elderly patients. An even number of residents from each post-graduate year will be randomly assigned to group A or group B by picking names out of a hat. Thus, 20 random interns will be in group A and 20 random interns will be in group B (the same applies to PGY-2 and PGY-3 residents). An independent authority will select the names and the investigators will not know which residents pertain to each group. Group A -- the intervention group -- will receive an in-depth 2-hour tutorial on Beers Criteria and appropriate prescribing to the elderly from a Columbia geriatrician. A short video on the history of medicine will also be viewed. Group B will serve as the control, only watching the history of medicine video and will receive no formal instruction in Beers Criteria. Two principal investigators will oversee each study arm. Each investigator will record the MRNs and comorbidities of patients who are older than 65 being seen on any given day in the AIM clinic. Each time a patient older than 65 is seen, at the end of the day both investigators for the study arm will independently check to see if any new inappropriate medications are prescribed according to the combination of Beers Criteria and patient demographics. The percentage of residents who prescribe inappropriate prescriptions per group will be calculated at 1 month, 3 months, 6 months and 12 months. The total number of inappropriate medications prescribed per resident and patient hospitalizations per group will also be recorded at the aforementioned time points. Data on prescribing of certain drug classes such as antipsychotics, long-acting benzodiazepines and anticholinergics to patients under 65 will also be collected for 5 patients per resident subject.

At the start of the study, all subjects will answer a questionnaire that asks which career specialty they intend to pursue and the level of their exposure to geriatrics. At the study conclusion, any residents who intend to enter geriatrics or who had extensive exposure to geriatrics in medical school will be excluded. It is assumed that the vast majority of residents are not familiar with the Beers Criteria since it is not generally taught in medical school. It is also assumed that there will be no significant difference in the characteristics of patients whom the subjects will treat as the trial will occur at one clinic. Tables will compare baseline subject and patient characteristics between the groups.

b. Study Population

All categorical Columbia internal medicine residents from June 2013 to June 2014 will be eligible for the study.

c. Inclusion/Exclusion Criteria

All categorical Columbia internal medicine residents will be studied. Any resident who intends to enter the field of geriatrics or had extensive exposure to geriatrics in medical school will be excluded.

d. Study outcomes

The primary outcome will be the rates of inappropriate prescribing by physicians per group according to the Beers criteria.

A secondary outcome will be a comparison between the two groups of the total number of inappropriate medications prescribed per resident according to the Beers Criteria. Another secondary outcome will be the total number of patient hospitalizations per group over the aforementioned study time course.

e. Statistical analysis

A chi-square test will be used to compare mean rates of inappropriately prescribed medications between the tutorial group and the control group at 1 month, 3 months, 6 months and 1 year. The same test will be used to compare the average number of inappropriate medications prescribed per resident in each group and the total number of patient hospitalizations per group. Although residents will be randomized, propensity score matching for inappropriate medications prescribed per resident will be implemented to eliminate any residual bias. The results will additionally be stratified by post-graduate year.  $P < 0.05$  will be used to indicate statistical significance. 64 residents per group will be needed in order to detect a 20% effect size at 80% power. 70% of uneducated residents are expected to prescribe inappropriate medications compared to 50% of residents who undergo the tutorial.

The unit of analysis is the physician. The study is powered to detect a 20% difference in inappropriate prescribing rates between the two groups (estimated 70% of uneducated residents prescribe inappropriate medications over the time course compared to 50% of residents who underwent the tutorial).

C. Study Drugs

None

D. Medical Device

None

E. Study Questionnaires

A questionnaire distributed to all subjects at the beginning of the study will have two questions:

1. What specialty do you intend to pursue?
2. What were the top 3 specialties you were exposed to at your medical school?

#### F. Study Subjects

Described above.

#### G. Recruitment of Subjects

All internal medicine residents will be asked to participate in the study by e-mail and once again in person at noon conference and morning report. Incentive to participate will be stimulated by offering a 10-ride metro card. Residents randomized to the tutorial group will be e-mailed the date and time of an in-depth 2 hour tutorial on Beers criteria and prescribing in the elderly. The tutorial will also include a short video on the history of medicine. The control group will only watch the video on the history of medicine.

#### Confidentiality of Data

Each subject enrolled will be identified as PGY-1, PGY-2 or PGY-3. All patients will have a unique identifier linked to their medical record number. This information will be stored in a secure location accessible only to the investigators.

#### H. Potential Conflict of Interest

There are no potential conflicts of interest in this study.

#### I. Location of the Study

The study will take place at New York Presbyterian Hospital – Columbia University Medical Center at the AIM clinic.

#### J. Potential Risks

There are no potential risks of this study.

#### K. Potential Benefits

The potential benefit to subjects is augmentation of their medical knowledge and improved clinical practice. The potential benefit to patients is decreased inappropriate medications, decreased adverse medication effects and decreased hospitalizations.

#### L. Alternative Therapies

The Inappropriate Prescribing in the Elderly Tool (IPET) and Screening Tool of Older Persons' potentially inappropriate Prescriptions (STOPP) are also currently utilized as guidelines for appropriate prescribing in the elderly.

#### M. Compensation to Subjects

Subjects will receive a 10-ride metro card.

#### N. Costs to Subjects

Only two-hours time at most for the Beers Criteria tutorial and video viewing.

#### O. Minors as Research Subjects

There will be no minors enrolled in this study.

#### P. Radiation or Radioactive Substances

There will be no radiation or radioactive substances used in this study.

#### Sources

*Aparasu RR, Mort JR (2000) Inappropriate prescribing for the elderly: Beers criteria-based review. Annals of Pharmacotherapy, 34, 338–346.*

Cynthia Cheng, MD, PhD. *Polypharmacy in the Aged*, 2005. [DVD] Thomas Jefferson University: NCME.

Gallagher et al. Inappropriate prescribing in the elderly. *J Clinical Pharm Thera.* 2007 Apr;32(2):113-21.

Hajjar ER et al. Polypharmacy in elderly patients. *American Journal of Geriatric Clinicopharmacology.* 2007 Dec;5(4):345-51.

Hajjar ER et al. Unnecessary drug use in frail older people at hospital discharge. *J Am Geriatr Soc.* 2005; 53: 1518-1523.

Kaufman DW et al. Recent patterns of medications use in the ambulatory adult population of the United States: The Slone survey. *JAMA.* 2002; 287: 337-344.

*Lau DT, Kasper JD, Potter EB et al. (2005) Hospitalization and death associated with potentially inappropriate medication prescriptions among elderly nursing home residents. Archives of Internal Medicine, 165, 68–74.*

Rochon, Paula A., and Kenneth E. Schmader. "Drug Prescribing for Older Adults." *Uptodate.com.* Uptodate, 22 June 2012. Web. <<http://www.uptodate.com/contents/drug-prescribing-for-elderly-adults>>.

*Wilcox SM, Himmelstein DU, Woolhandler S (1994) Inappropriate drug prescribing for community dwelling elderly. JAMA, 272, 292–296.*

Williams CM. Using medications appropriately in older adults. *American Family Physician.* 2002; 66: 1917-27.

Zhan et al. Potentially inappropriate medication use in the community-dwelling elderly: findings from the 1996 Medical Expenditure Panel Survey. *JAMA.* 2001 Dec 12;286(22):2823-9.

