



The Beers Criteria

A Quality Tool



by Christina Phan, PharmD and Craig Stern, PharmD, MBA
(Beers Criteria listed on page 49)

For a decade or more there has been a concern regarding the quality of medication therapy provided to the elderly population. There is now ample evidence to support this concern. Elderly patients in the United States consume at least a third of all prescribed medications. Nursing home residents use at least six medications and 20% of them use at least 10 medications. Statistics show that thirty percent of hospital admissions in elderly patients are attributed to adverse drug events (ADE) or drug toxicity. Gurwitz et al. estimated 1.89 ADEs per 100 resident-months, and at least one-half were identified as preventable. Bond et al. quoted an overall incidence of adverse drug reactions (ADR) in hospitalized Medicare patients of 6.7% (range 1.2–24%) and 0.32% for fatal ADRs. The resulting cost estimates are \$1.56 to \$4B/year. Regrettably, fatal ADRs rank fourth to sixth in leading causes of death.

ADEs not only contribute to increased health care costs, but also to a reduction in quality of life.² A measure of the quality of medication therapy needs to be used in order to evaluate the safety of a prescriber's or institution's medication prescribing. Since its formulation in 1991, the Beers criteria have been used by many institutions including the Center for Medicare and Medicaid Services (CMS) as a standard for determining the quality of medication therapy for the elderly.⁴

What is the Beers list?

The Beers Criteria was formulated in 1991 in response to a need for explicit criteria to evaluate the medications administered to nursing home patients older than 65 years of age. The list was determined by group consensus after review of current literature. The evaluating body consisted of nationally recognized experts in clinical geriatric care, geriatric pharmacology and psycho-pharmacology. The original criteria included a list of medications or medication classes that should generally be avoided in nursing home residents older than 65 years of age, because of their high risk or adverse effects. The list also included doses, frequencies or durations of therapies that were appropriate for use in the elderly.¹ In 1997 the criteria were updated to include

new medications and new information regarding side effects. In addition, the investigators included a severity rating scale as well as a list of medications that were inappropriate for those with specific medical conditions. Finally, the criteria were adjusted so that they could be applied in general to the elderly population and not specifically to those older than 65 years of age residing in nursing homes.³ The most recent update of the criteria occurred in 2003 when the panel of experts reevaluated the 1997 criteria, considered the inclusion of newer medications, incorporated updated information, reevaluated the severity ratings and identified new medication conditions that were not considered in the 1997 criteria.⁴

What was the motivation for the list?

In response to the increased utilization of medications in the geriatric community, and the increased risks of drug-related adverse drug reactions and hospitalizations, the Beer's list was created in order to identify potentially inappropriate medications. The geriatric population is specifically at risk for ADEs because of the age-associated changes in the functions of various organs that may affect the pharmacokinetics and pharmacodynamics of many drugs.⁹ Chan et al. showed that 30% of hospital admissions of elderly patients were attributed to an adverse drug event and that 53.4% of these admissions could have been prevented.¹⁴ The incidence of adverse drug events in the ambulatory setting has been reported to be 50.1 events per 1000 patients per year; 13.8 of these events were preventable. Of these adverse drug events, 38% were defined as serious, life-threatening or fatal; 42.2% of these events were preventable.¹⁵ Due to the high prevalence of drug-related ADE and hospitalizations, a quality tool to assess inappropriate drug use was needed.

How is the list used in various healthcare settings?

The Beer's list has been acknowledged to be a useful guide in assessing the appropriateness of drug prescribing in the elderly. One

study utilized the Beer's criteria in the development of a list of potential medication problems which was then applied to a model for improving medication use in home health care patents. Their model for problem assessment and resolution was based on the use of the guidelines by the drug utilization review coordinator and the attending home health care nurse. The DUR coordinator uses the guidelines to identify potential medication problems and then works with the home health nurse and physician to assess the situation.¹⁶ Many groups, including the Hartford Institute for Geriatric Nursing, have suggested in their "best practice guidelines" that the Beers criteria be used to identify medications that may increase risk for ADR.¹⁷ In addition, the American Pharmacist Association's Medication Therapy Management Services Outcomes Measurement Task Force has suggested the use of the Beer's criteria as a process measure to determine the appropriate use of medications, insure adherence to guidelines and evaluate the quality of care.

What are the clinical arguments for applying the

The usefulness of the Beer's Criteria in predicting adverse drug reactions and increases in costs and resource utilization has been demonstrated through various studies. Chang et.al found a positive association between potentially inappropriate medications as described by the Beer's Criteria and adverse drug reactions in first-visit elderly outpatients.¹⁸ In the population that was studied they found that 11.6% had been prescribed an inappropriate medication and that 22.9% had an adverse drug reaction. Another study involving the impact of potentially inappropriate medications in a Medicare managed care population showed that a high prevalence of potentially inappropriate medications (24.4%) among the elderly that was associated with higher costs and higher mean numbers of inpatient visits, ER visits, office visits, outpatient visits and higher mean total facility, provider and prescription costs.⁵

CMS has incorporated the use of the Beers criteria into its *Guidelines to Surveyors of Long Term Care Facilitators*. The guidelines list medications that may potentially cause adverse reactions, reasons for their inclusion on the list, adverse reactions associated with the medication and possible exceptions allowing the use of a potentially inappropriate medication. Failure of an institution to comply with these guidelines may result in a federal deficiency (F-tag) citation. (Note: The F-tag 329 refers to a nursing home resident's "right to be free from unnecessary drugs."¹⁹⁻²⁰

What are the clinical arguments against using the list?

Despite the popularity of the Beers criteria, there has been criticism regarding its predictive value. The Duke Cohort study analyzed the relationship between inappropriate drug use as defined by the Beers criteria, and mortality in community dwelling elders as well as the effects of inappropriate drug use and the decline in functional status. The study found that 28% of the population had used one or more inappropriate medications and that half of the users were taking a drug classified as high severity. By the end of the three year study, 17% of the population had died; however there was no significant association between the use of inappropriate medications and mortality, or decline in functional status.⁸

What is the current experience with its use?

Most studies utilize the Beers criteria as a tool for determining the prevalence of inappropriate drug prescribing and to evaluate the quality of care provided to patients. The use of the criteria has expanded beyond the nursing home setting to include skilled nursing facilities, board and care facilities, office-based physicians, as well as community-dwelling adults.^{2,8-13} All of the studies conducted in the various settings found a high prevalence of inappropriate medication use in the elderly population, which may in turn suggest poor quality

of care. However, many of these studies did not analyze the direct consequences of inappropriate drug use.

Chang et.al studied the list in first-visits of elderly outpatients to outpatient clinics associated with tertiary care academic medical centers in Taiwan. They identified a positive association between the list and ADRs in patients taking five or more medications, a history of ADRs, or poor compliance.¹⁸

What are the limitations on their use?

The Beers criteria have several limitations. Since the criteria were created based on the opinions of an expert panel, they are not evidence-based, and therefore, may not be applicable to every situation. The American Medical Directors Association and the American Society of Consultant Pharmacists issued a joint position statement on the Beers List expressing their concerns that because the list was not created based on an evidence-based methodology, it should only be used as a "helpful general guide" to identify potentially inappropriate medication use in the elderly. They stress that that the ultimate decision for the use of a medication should be clinically based.²⁰ The general applicability of the criteria is also questionable because the updated 2003 criteria are meant to apply to the general population of adults 65 years and older and may not apply to significantly older individuals or those with complex disease states.⁴ Also, the criteria are based on current information and opinions at the time of their creation and thus, will need to be periodically updated to include new information and scientific information.¹

The Beers list is limited and thus does not contain all medications that may be inappropriate. Medications that are not on the list may still be inappropriate for elderly patients. Furthermore, medications that are on the list may still be an appropriate therapeutic option as long as the patient is closely monitored and the dosing regimen is adjusted for each individual patient.⁶

What are the lessons for pharmacists?

The Beers criteria serve as a useful quality tool for identifying potentially inappropriate medications. However, they should only be used as a general guideline to alert pharmacists and other health professionals of potential adverse reactions and should not be used as an absolute indicator of adverse events. In addition to the criteria, pharmacists must evaluate and address the needs of the individual patients. It is important that pharmacists apply both clinical knowledge and evidence based medicine in formulating their therapeutic decisions. Ultimately, the Beers criteria should not be used as a replacement for, or independent of, a clinician's judgment. Rather, the Beers criteria should be used in conjunction with the knowledge and experience of a health professional, taking the individual needs of a patient into account.

References

1. Beers MH, Ouslander JG, Rollingher I, Reuben DB, Brooks J, and Beck JC. Explicit Criteria for Determining Inappropriate Medication Use in Nursing Home Residents. *Arch Intern Med.* 151(9):1825-32. 1991, Sep.
2. Beers MH, Ouslander JG, Fingold SF, Morgenstern H, Reuben DB, Rogers W., Zeffren MJ, and Beck JC. Inappropriate Medication Prescribing in Skilled- Nursing Facilities. *Annals of Internal Medicine.* 117 (8): 684-689. 1992, October.
3. Beers, MH. Explicit Criteria for Determining Potentially Inappropriate Medication Use by the Elderly; An Update. *Arch Intern Med.* 157(14). 1997, July.
4. Fick, DM, Cooper JW, Wade WE, Waller JL, Maclean JR, and Beers MH. Updating the Beers Criteria for Potentially Inappropriate Medication Use in Older Adults: Results of a US Consensus Panel of Experts. *Arch Intern Med.* 163: 2716-2724. 2003, Dec.
5. Fick DM, Waller JL, Maclean JR, Heuvel RV, Tadlock JG,

- Gottlieb M, and Cangialose CB. Potentially Inappropriate Medication Use in Medicare Managed Care Population: Association with Higher Cost and Utilization. *J Managed Care Pharm.* 7(5): 407-413. 2001, September/October.
6. Gurwitz JH and Rochon P. Improving the Quality of Medication Use in Elderly Patients: A Not-So- Simple Prescription [Letter]. *Archives of Internal Medicine.* 162(15). 2002, August.
 7. Aparasu RR and Mort JR. Inappropriate Prescribing for the Elderly: Beers-Criteria- Based Review. *The Annals of Pharmacotherapy.* 34: 338-26. March 2000.
 8. Hanlon JT, Fillenbaum GG et al. Impact of Inappropriate Drug Use on Mortality and Functional Status in Representative Community Dwelling Elders. *Med Care.* 40: 166-176. October 2002.
 9. Aparasu RR and Sitzman SJ. Inappropriate prescribing for elderly outpatients. *Am J Health-Syst Pharm.* 56: 433-9. March 1999.
 10. Spore DL, Mor V., Larrat P, Hawes C., and Hiris J. Inappropriate Prescriptions for Elderly residents of Board and Care Facilities. *Am J Public Health.* 87: 404-409. March 1997.
 11. Aparasu RR and Fliginger S. Inappropriate Medication Prescribing For the Elderly By Office-Based Physicians.
 12. Stuck AE, Beers MH, Steiner A., Aronow HU, Rubenstein LZ, and Beck JC. Inappropriate Medication Use in Community Residing Older Persons. *Arch Intern Med.* 154: 2195-2200. October 1994.
 13. Wilcox, SM, Himmelstein DU, and Woolhandler S. Inappropriate Drug Prescribing for Community- Dwelling Elderly. *Journal of American Medication Association.* 272(4): 292-296. July 1994.
 14. Chan M, Nicklason R. and Vial JH. Adverse Drug Events as Cause of Hospital Admission in the Elderly. *Internal Medicine Journal.* 31:199-205. 2001.
 15. Gurwitz, JH, Field TS, Harrold LR. Et. al. Incidence and Preventability of Adverse Drug Events Among Older Persons in the Ambulatory Setting. *Journal of American Medical Association.* 289 (9): 1107-1116. March 2003.
 16. Brown HJ, Griffin MR, Ray WA et. al. A Model For Improving Medication Use in Home Health Care Patients. *Journal of the American Pharmaceutical Association.* 38(6):696-702. November/ December 1998.
 17. Molony, S. Beer's Criteria For Potentially Inappropriate Medication use in Elderly. Try This: Best Practices in Nursing Care to Older Adults. <http://www.hartfordign.org/publications/trythis/issue16.pdf>
 18. Chang, CM, Liu PYY, Yang YHK et. al. Use of Beers Criteria to Predict Adverse Drug Reactions Among First-Visit Elderly Outpatients. *Pharmacotherapy,* 25(6): 831-838. November 2005.
 19. Medicare State Operations Manual Provider Certification. April 2000. Available at: www.cms.hhs.gov/transmittals/downloads/R15SOM.pdf. Accessed: May, 2006
 20. Swagerty D. and Brickley R. American Medical Directors Association and the American Society of Consultant Pharmacist Joint Position Statement on the Beers List of Potentially Inappropriate Medications in Older Adults. October 2004.

About the Author

Christina Phan is a PharmD candidate at the University of Southern California.

Craig Stern, PharmD, MBA is President of ProPharma Pharmaceutical Consultants, Inc. in Northridge and currently serves as CPhA's Editorial Review Committee Chairperson.



GROUP SAVINGS PLUS®

How will you spend your savings?

If you're not a member of our Group Savings Plus program, then you're not taking advantage of the group buying power of the **California Pharmacists Association**.

So you could be paying too much for auto insurance. \$327.96 too much!

Just think what you could do with that extra money.

With Group Savings Plus, CPhA members will enjoy:

- A group discount of up to 20% off our already competitive rates on auto and home insurance*
- Additional savings based on your age, level of education and more*
- Convenient payment options
- Rates guaranteed for 12 months, not six
- 24-Hour claims service and Emergency Roadside Assistance**



Another sponsored benefit from the California Pharmacists Association

Call now and see just how much you can save. Then start spending your money on something a bit more exciting than auto insurance!

Brought to you by
MARSH
Affinity Group Services
Seabury & Smith
Insurance Program Management
CA License #0633005

**For a free, no-obligation rate quote,
please call 1.888.380.9097 or visit
www.libertymutual.com/lm/cpha.**



*Figure based on a March 2006 sample of auto policyholder savings when comparing their former premium with those of Liberty Mutual's group auto and home program. Individual premiums and savings will vary.
**Discounts, credits and program features are available where state laws and regulations allow and may vary by state. Certain discounts apply to specific coverages only. To the extent permitted by law, applicants are individually underwritten; not all applicants may qualify. *Service applies to auto policyholders and is provided by Cross Country Motor Club of Boston, Inc., Boston, MA or through Cross Country Motor Club of California, Inc., Boston, MA. Coverage provided and underwritten by Liberty Mutual Insurance Company and its affiliates, 175 Berkeley Street, Boston, MA. © 2006 Liberty Mutual Insurance Company. All Rights Reserved.