

Health Outcome Prioritization as a Tool for Decision Making Among Older Persons With Multiple Chronic Conditions

Older persons with multiple chronic conditions are at substantial risk for unintended adverse outcomes, such as medication adverse events. Less-severe adverse events are commonly referred to as “side effects,” implying that they are secondary to disease-specific benefits. However, patients consider these adverse events to be important outcomes in their own right.¹ Such findings suggest that all possible benefits and harms resulting from different treatment options be considered as competing outcomes, among which older persons with multiple chronic conditions face trade-offs.

When treatments involve trade-offs, the best option depends on patients’ preferences. The challenge for older persons with multiple conditions is that these trade-offs encompass both many different specific diseases and non-disease-specific health domains.² One approach to this challenge is to consider treatment in terms of its effects on a set of universal, cross-disease outcomes and to use older persons’ prioritization of these outcomes as an assessment of preferences. These outcomes, examples of which include length of life, physical and cognitive function, and symptoms, include basic domains recognized to be the key components of health.³ The goal of this study was to explore the use of a simple tool to elicit older persons’ health outcome priorities.

See also pages 1831 and 1839

*See Invited Commentary
on page 1837*

Methods. Participants were recruited from 3 senior centers and 1 independent/assisted-living facility in the New Haven area in Connecticut. All volunteers were included in the study without exclusion except for residents in the assisted-living facility with a diagnosis of dementia. The protocol was approved by the Yale University School of Medicine Human Investigations Committee.

All data were collected by self-report in face-to-face interviews. The main outcome variable was participants’ prioritization of 4 universal health outcomes: keeping you alive, maintaining independence, reducing or eliminating pain, and reducing or eliminating other symptoms (eg, dizziness, fatigue, shortness of breath). These priorities were elicited using a computerized tool, in which each of these outcomes was presented in a moveable box on a screen. Participants were asked to provide a rank order of priorities. Participants were also asked to provide a priority score by placing the boxes on a visual analog scale from 0 to 100, with higher scores indicating that the outcome was more important. The tool was accompanied by a script explaining the concept of competing outcomes (eAppendix 1; <http://www.archinternmed.com>). Initial development and testing of the tool has been previously described.⁴ In response to poor test-retest re-

liability, the script was modified prior to the start of the present study to emphasize the notion of trade-offs.

The methods and results for examining the test-retest reliability of the tool are available in eAppendix 2 and the eTable.

We examined distributions of health outcome priorities in 2 ways. We first examined the proportion of participants choosing different priority rankings. We next used the spread in scores assigned to each outcome to evaluate the strength of importance ascribed to each outcome. We divided the participants into 4 groups according to which of the outcomes they selected as most important. Within each of these groups, we calculated the mean score for each outcome.

Results. Of the 357 participants, 75% were women and were white, 69% had 4 or more chronic conditions, and 49% were prescribed 4 or more medications. Maintaining independence was the health outcome ranked as most important by most participants (76%), with varying proportions of participants ranking each of the other outcomes as most important (**Table**). Within each outcome ranked as most important, there was variability in the rankings of the other outcomes, although patterns did emerge. Among those ranking maintaining independence as most important, most participants (67%) ranked pain and/or symptom relief as second and/or third and staying alive as least important. Among those ranking staying alive as most important, most (66%) ranked maintaining independence as second and pain and/or symptom relief as third and/or fourth. Among those ranking pain or symptom relief as most important, there was more variability in the rankings of the other outcomes.

The mean scores for the outcome ranked as most important were 97 to 98, with narrow standard deviations. The standard deviations around the mean scores for other health outcomes were large. For participants who ranked staying alive as most important, the other outcomes also received high mean scores (maintaining independence, 80; pain relief, 70; and symptom relief, 65). For all participants who ranked an outcome other than maintaining independence as most important, maintaining independence received mean scores close to the most highly scored outcome (80-84). In contrast, for participants who ranked an outcome other than staying alive as most important, staying alive received mean scores substantially lower than the most highly scored outcome (52-59).

Comment. The variability in universal health outcome rankings is similar to the variability seen in patients’ valuations of disease-specific health outcomes.^{5,6} Nonetheless, the importance of maintaining independence for many participants has also been demonstrated in studies evaluating older persons’ preferences in end-of-life decision making.⁷⁻⁹ The similarities in findings across studies examining different clinical situations and using different methods support the key role that function should play in treatment decision making for older persons.

These findings illustrate a potential role for health outcome prioritization at both the individual and population level. At the population level, the effects of treatment interventions are currently generally assessed in

Table. Proportion of Participants With Different Health Outcome Rankings, Organized by Health Outcome Ranked as Most Important

Health Outcome Ranking				
First (Most Important)	Second	Third	Fourth	No. (%) ^a
Independence				270 (76) ^b
	Pain relief	Symptom relief	Staying alive	104 (39) ^c
	Symptom relief	Pain relief	Staying alive	76 (28) ^c
	Staying alive	Pain relief	Symptom relief	38 (14) ^c
	Staying alive	Symptom relief	Pain relief	22 (8) ^c
Staying alive	Pain relief	Staying alive	Symptom relief	19 (7) ^c
	Symptom relief	Staying alive	Pain relief	11 (4) ^c
	Independence	Pain relief	Symptom relief	40 (11) ^b
	Independence	Symptom relief	Pain relief	13 (33) ^c
	Pain relief	Independence	Symptom relief	13 (33) ^c
Pain relief	Pain relief	Symptom relief	Independence	7 (18) ^c
	Symptom relief	Independence	Pain relief	5 (13) ^c
	Independence	Independence	Pain relief	2 (5) ^c
	Independence	Symptom relief	Staying alive	26 (7) ^b
	Symptom relief	Independence	Staying alive	11 (42) ^c
Symptom relief	Independence	Staying alive	Symptom relief	7 (27) ^c
	Symptom relief	Staying alive	Independence	4 (15) ^c
	Staying alive	Symptom relief	Independence	3 (12) ^c
	Staying alive	Symptom relief	Independence	1 (4) ^c
	Staying alive	Symptom relief	Independence	21 (6) ^b
Staying alive	Independence	Pain relief	Staying alive	11 (52) ^c
	Staying alive	Independence	Pain relief	4 (19) ^c
	Independence	Staying alive	Pain relief	3 (14) ^c
	Pain relief	Independence	Staying alive	2 (10) ^c
	Pain relief	Staying alive	Independence	1 (5) ^c

^aPercentages do not add up to 100% because of rounding.

^bPercentage of total participants (N=357).

^cPercentage of health outcome ranked first.

terms of disease-specific outcomes or reduction in mortality. Moreover, nonmortality outcomes are frequently measured by a composite quality of life index, which averages the effects of the intervention across the different domains of functioning and symptoms. The variable importance of each of these individual domains to older persons argues for efforts to examine the effect of treatment on each domain. At the individual level, the study results suggest that the prioritization of outcomes can be used to begin a discussion about what is most important to older persons with multiple conditions. The variability in individual priorities will require the development of a range of treatment options, designed to increase the likelihood of wanted outcomes and decrease the likelihood of unwanted outcomes.

Terri R. Fried, MD
 Mary E. Tinetti, MD
 Lynne Iannone, MA
 John R. O'Leary, MA
 Virginia Towle, MPhil
 Peter H. Van Ness, PhD

Author Affiliations: Department of Medicine (Dr Fried), School of Epidemiology and Public Health (Dr Tinetti), and Program on Aging (Mss Iannone and Towle, Mr O'Leary, and Dr Van Ness), Yale University School of Medicine, New Haven, Connecticut; and Clinical Epidemiology Research Center, VA Connecticut Healthcare System, West Haven (Dr Fried).

Published Online: September 26, 2011. doi:10.1001/archinternmed.2011.424

Correspondence: Dr Fried, VA Connecticut Healthcare System, 950 Campbell Avenue, Mail Stop CERC 151B, West Haven, CT 06516 (terri.fried@yale.edu).

Author Contributions: Dr Fried had full access to all of the data in the study and takes responsibility for the integrity of the data and the accuracy of the data analysis. *Study concept and design:* Fried and Tinetti. *Acquisition of data:* Fried, Iannone, O'Leary, and Towle. *Analysis and interpretation of data:* Fried, Tinetti, Iannone, O'Leary, Towle, and Van Ness. *Drafting of the manuscript:* Fried. *Critical revision of the manuscript for important intellectual content:* Tinetti, Iannone, O'Leary, Towle, and Van Ness. *Statistical analysis:* Van Ness. *Obtained funding:* Fried and Tinetti.

Financial Disclosure: None reported.

Funding/Support: This study was supported by grant Pioneer 58381 from the Robert Wood Johnson Foundation and by the Claude D. Pepper Older Americans Independence Center at Yale University School of Medicine (#P30AG21342 from the National Institutes of Health/National Institute on Aging [NIH/NIA]). Dr Fried is supported by grant K24 AG028443 from the NIH/NIA.

Role of the Sponsors: The sponsors had no role in the design and conduct of the study; collection, management, analysis, and interpretation of the data; and preparation, review, or approval of the manuscript.

Online-Only Material: eAppendixes 1 and 2 and the eTable are available at <http://www.archinternmed.com>.

Additional Contributions: Andrea Benjamin, RN, provided skillful interviews of the participants.

1. Fried TR, Tinetti ME, Towle V, O'Leary JR, Iannone L. Effects of benefits and harms on older persons' willingness to take medication for primary cardiovascular prevention. *Arch Intern Med.* 2011;171(10):923-928.
2. Leipzig RM, Whitlock EP, Wolff TA, et al; US Preventive Services Task Force Geriatric Workgroup. Reconsidering the approach to prevention recommendations for older adults. *Ann Intern Med.* 2010;153(12):809-814.
3. Preamble to the Constitution of the World Health Organization as adopted by the International Health Conference. New York, NY: 19-22 June, 1946; signed on 22 July 1946 by the representatives of 61 States (Official Records of the World Health Organization, no. 2, p. 100) and entered into force on 7 April 1948.
4. Fried TR, Tinetti M, Agostini J, Iannone L, Towle V. Health outcome prioritization to elicit preferences of older persons with multiple health conditions. *Patient Educ Couns.* 2011;83(2):278-282.
5. Nease RF Jr, Kneeland T, O'Connor GT, et al; Ischemic Heart Disease Patient Outcomes Research Team. Variation in patient utilities for outcomes of the management of chronic stable angina: implications for clinical practice guidelines. *JAMA.* 1995;273(15):1185-1190.
6. Man-Son-Hing M, Gage BF, Montgomery AA, et al. Preference-based anti-thrombotic therapy in atrial fibrillation: implications for clinical decision making. *Med Decis Making.* 2005;25(5):548-559.
7. Rosenfeld KE, Wenger NS, Kagawa-Singer M. End-of-life decision making: a qualitative study of elderly individuals. *J Gen Intern Med.* 2000;15(9):620-625.
8. Fried TR, Bradley EH, Towle VR, Allore H. Understanding the treatment preferences of seriously ill patients. *N Engl J Med.* 2002;346(14):1061-1066.
9. Ditto PH, Druley JA, Moore KA, Danks JH, Smucker WD. Fates worse than death: the role of valued life activities in health-state evaluations. *Health Psychol.* 1996;15(5):332-343.

ONLINE FIRST | LESS IS MORE

"Top 5" Lists Top \$5 Billion

The Good Stewardship Working Group presented the top 5 overused clinical activities across 3 primary care specialties (pediatrics, internal medicine, and family medicine), as chosen by physician panel consensus.¹ All activities were believed to be common in primary care but of little benefit to patients. We examined the frequency and associated costs of these activities using a national sample of ambulatory care visits.

Methods. We performed a cross-sectional analysis using data from the 2009 National Ambulatory Medical Care Survey (NAMCS) and the National Hospital Ambulatory Medical Care Survey (NHAMCS). The NAMCS and NHAMCS survey patient visits to physicians in non-federally funded, non-hospital-based offices and non-federally funded hospital outpatient departments, respectively.²

We limited our sample to visits by patients to their primary care physicians. Visits for each "top 5" primary care activity were identified using a combination of the patient-described Reason For Visit (RFV) and the physician's diagnosis as coded by the *International Classification of Diseases, Ninth Revision, Clinical Modification* (Table). Nonrecommended care ordered during the visit included that defined by the Good Stewardship Working Group (Table), with some exceptions owing to methodological limitations (unable to identify early referral of otitis media with effusion and appropriate use of corticosteroids based on asthma severity). We excluded from the denominator those visits in which the activity could be considered appropriate.

We calculated each activity as the proportion of eligible visits during which the patient received nonrecommended care. We applied the sampling weights and sample design variables to generate national estimates and 95% confidence intervals using Stata statistical software, version 11.0 (StataCorp, College Station, Texas).

We estimated the costs of procedures using the 2011 Medicare physician fee schedule, and in the case of laboratory tests, the 2011 Medicare Clinical Laboratory Fee Schedule³ (eTable; <http://www.archinternmed.com>). We estimated the costs of drugs using common acquisition costs to consumers from drugstore.com⁴ or retail pharmacies.⁵

Results. We found a wide range of frequencies (1.4%-56.0%) of nonrecommended activities in primary care, accounting for an approximate annual cost of \$6.76 billion (95% CI, \$5.0-\$9.1 billion) (Table). The ordering of a complete blood cell count for a general medical examination was the most prevalent activity (56.0%, 95% CI, 40.8%-70.2%) and was associated with a cost of \$32.7 million (95% CI, \$23.9-\$40.8 million).

Several practice activities occurred less commonly, such as ordering of bone density testing in women younger than 65 years (1.4%; 95% CI, 0.9%-2.2%) and Papanicolaou tests for patients younger than 21 years (2.9%; 95% CI, 1.7%-5.0%). We were unable to report the performance of dual-energy x-ray absorptiometry scans in men younger than 70 years and imaging for children with head injuries in ambulatory settings owing to their low frequency (visits <30).

Cost of unnecessary services was a function of both the frequency and the reimbursement rates for each service. The practice activity associated with the highest cost was the prescribing of brand instead of generic statins, resulting in excess expenditures of \$5.8 billion per year (95% CI, \$4.3-\$7.3 billion). Bone density testing in women younger than 65 years was the least prevalent activity but accounted for \$527 million (95% CI, \$474-\$1054 million) in costs.

Comment. Our analysis of outpatient visits demonstrates that there is considerable variability in the frequency of inappropriate care and that many of the activities identified in the Good Stewardship "Top 5" lists¹ have marginal impact on health care costs. Approximately 86% of the costs associated with the "Top 5" lists were from the use of brand name instead of generic statins. Although generic drug substitutions may appear to be a "low hanging fruit" for drug savings, numerous efforts have already been made by the US states (generic substitution laws), payers (tiered formularies), and health care providers (generic drug detailing) to achieve this goal. In this light, our data suggest that considerably more work is needed to reduce the costs associated with brand name statin use. Our results also demonstrate that highly prevalent activities with small individual costs can result in large overall costs to the health care system and thus warrant further attention.

Our analysis is limited by the available data of the NAMCS/NHAMCS data set and by our ability to accurately estimate visits with inappropriate care. We were conservative in our assessment of inappropriate care and were careful to exclude visits where care could be potentially appropriate, likely lowering our cost estimates.

The recent debate surrounding escalating health care costs and the sustainability of Medicare have focused attention on the delivery of high-quality, efficient care. The discussion certainly needs the participation of physicians who are willing to examine their own practices, such as the Good Stewardship Working Group. However, most primary care activities identified by the working group